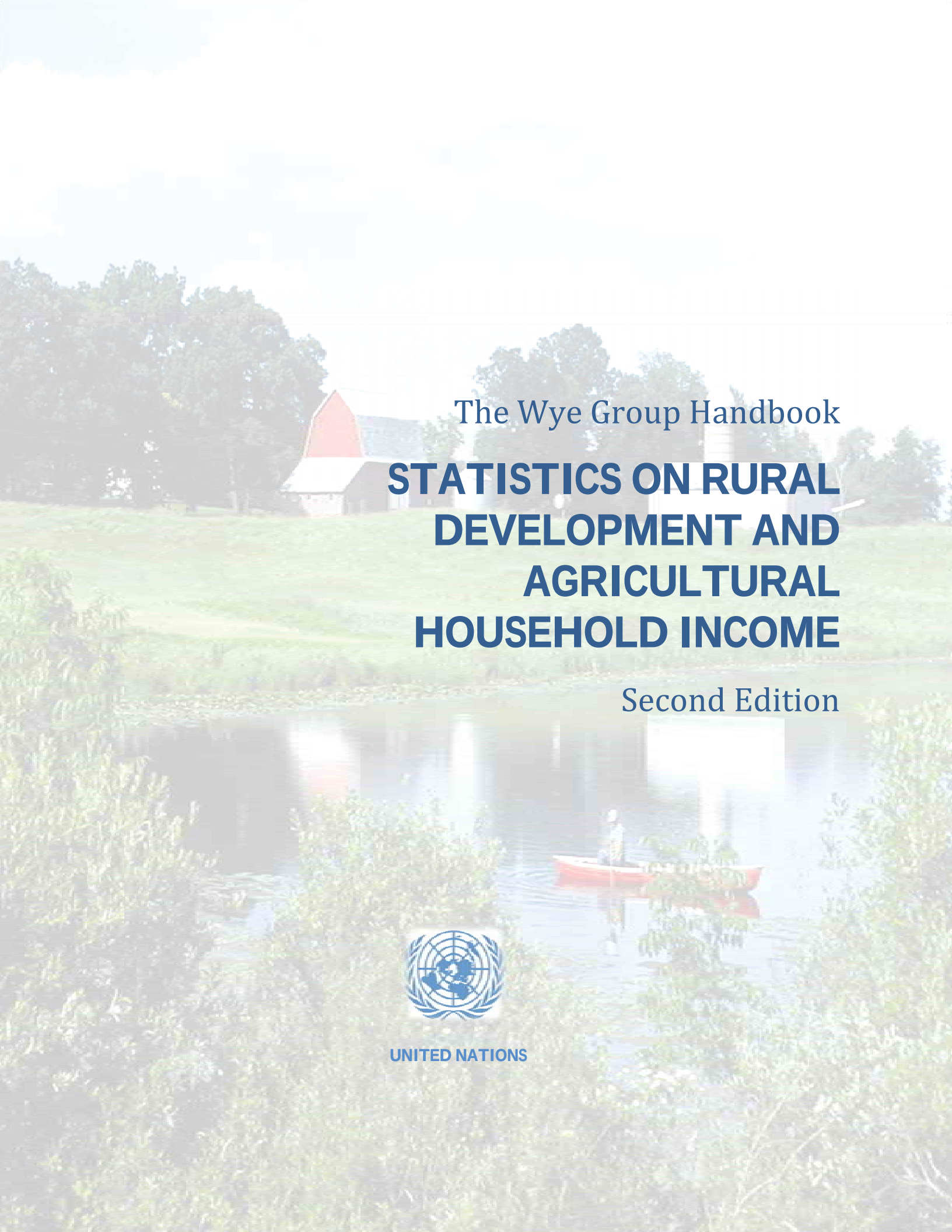

The Wye Group Handbook

STATISTICS ON RURAL DEVELOPMENT AND AGRICULTURAL HOUSEHOLD INCOME

Second Edition

UNITED NATIONS

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PREFACE TO THE HANDBOOK

WHY THIS HANDBOOK?

As the world changes, so should the collection of public statistics that inform governments and citizens about the nature of their lives and their livelihoods. The past decades have seen large changes in the structure and significance of farming and in the composition of rural economies.

In OECD countries (a short-hand term for developed economies) food is less and less a matter of commodities and agriculture is more than just their production. With food sufficiency not an issue for most, consumers have developed strong preferences with respect to food quality and safety. In rural areas farms are often no longer the mainstay of the economy, and many farm families have income from both the farm business and off-farm employment. Accordingly, public data collection is under increasing pressure to move away from an almost-exclusive focus on commodity production and factor use. But move to what? This Handbook responds to the question, what next for rural and agricultural statistics? It envisages the need for better data and indicators on the environment, rural economies and communities, and, very importantly, the farm household itself.

In developing countries (another short-hand way of referring to a broad range of situations) agriculture is still relatively important and food security remains an issue, though in many cases changes are being seen that move them towards the position of higher-income economies. Poverty is still a characteristic of rural areas.

Data requirements for effective policies to address these issues are increasing at a time when statistical capacity is declining in many developing countries. For them there is a widening gap between data requirements and data availability and quality, and they are not able to meet the statistical needs of the 21st century. This situation has led the UN Statistical Commission to develop a *Global Strategy to Improve Agricultural and Rural Statistics* in order to reverse this tendency.

The recent food crisis and food market volatility, the debate on environment and climate change and their interaction with agriculture, and the 2008 World Development Report of the World Bank - Agriculture for Development - have led to a renewed recognition of the critical importance of the agriculture sector as a source of economic growth, food security, poverty reduction and improvement of the livelihood of a large proportion of the population in many developing countries.

The food crisis and food price volatility have also affected OECD countries, as also has the need for the adaptation of agriculture to climate change. There too implications can be seen for agricultural and rural statistics needed to inform policies directed at these issues.

Changes in the rural and farm sectors are accompanied by growing requirements for comparability in statistics across countries, reflecting the phenomenon of globalisation, and for statistics as a measure of accountability in the use of public funds.

For agriculture, world markets matter, and multi-lateral trade liberalization almost certainly will require some degree of farm policy reform in developed – if not developing – countries. International trade agreements already point in the direction of the likely outcome – a requirement that domestic farm support should distort world markets as little as possible. In practice, this criterion largely rules out direct market intervention to affect prices, area planted or quantity produced. As a consequence, the impact of policy can no longer be assessed simply by observing supply and demand shifts in commodity markets.

Market interventions are often replaced by direct payments to farm households. The disposition of those payments – as allocated between the farm business and other activities – is conditioned by the household's income and wealth, along with its preferences and demographic characteristics. The outcome is a matter for empirical analysis. Understanding the ultimate market impacts of these direct payments depends on having data on farm households that includes the farm operation and also all other activities. Focus on farm accounts and business alone is not sufficient.

In some constructions of an eventual agreement in the current Doha Round of trade negotiations, nations would be required to demonstrate that domestic support provided to their farmers does **not** distort world markets, that is, it does not cause them to increase agricultural production such that aggregate supply is affected significantly. Proving a negative proposition is difficult enough, but without data on the full range of a farm household's activities (that defines its choices for use of the direct payments), it really is impossible. Therefore, some degree of comparability across nations in farm household data is probably the precursor to its effective use in analyses that assess the degree to which countries are meeting their international obligations.

Beyond uses in international fora, data on rural and farm households and on rural economies and environments are increasingly sought as measures of the efficacy of public policies. Accountability is more than ever a requirement in governance, in both developed and developing countries. Objective assessment of the well-being of a nation's households is one obviously important indicator of success. The condition of the natural environment is another. For rural areas, these dimensions of the quality of life are important in sustaining agriculture but also other activities such as tourism. The need to understand the causal linkages between government actions and economic and environmental well-being puts renewed emphasis on the careful selection of indicators and their policy relevance. Quantification is the by-word of accountability.

WHO IS THE HANDBOOK WRITTEN FOR?

The Handbook is intended for the benefit of various groups concerned with rural development and the evolution of the agricultural industry. It aims to be a guide for the providers of statistics, not only those who confront measurement challenges for the first time, but also for those who are building on existing programmes. Statistical offices often have to make choices. The Handbook explains the underlying economic and statistical concepts and principles needed to enable these offices to make their choices in efficient and cost effective ways and to be aware of the implications of their decisions**.**

It is also intended for those who use the data to perform analyses and to interpret what the statistics mean for personal and national goals. The Handbook will be of special interest to those in the public sector responsible for setting targets and monitoring policies related to:

- The standard of living and well-being of rural households vis-à-vis urban and all households, and
- The standard of living and well-being of agricultural households vis-à-vis households of other socio-professional categories.

The Handbook aims to be guide for current **good practice** for agencies when compiling their statistics on rural development and agricultural household incomes. Because of practical and resource constraints some of the current recommendations may not be immediately attainable by all statistical offices. However, they should serve as points of reference for agencies as they revise their statistics and improve their programmes, drawing upon the collective expertise accumulated in many countries and providing a means of access to this form of social capital. Also, as a living document, it represents a potential repository for findings of new ways to approach measurement of important variables. In this respect, both developed and developing country settings are important**.**

The Handbook draws upon the experience of many statistical offices throughout the world. The procedures these offices use are not static but continue to evolve and improve in response to several factors. Academic research continually improves and refines the economic and statistical theory underpinning rural indicators. New technology can also affect the methods used to collect rural statistics and transmit them. The present Handbook is therefore intended to be a "*web-based living document*" which will be periodically updated and amended. Some of the chapters, therefore, have the character of work-in-progress to which information will be continuously added. This is certainly the case for the chapters dealing with case studies of country experiences.

DIRECTIONS AND METHODS OF WORK FOR COMPILING THE HANDBOOK

The first edition of this Handbook grew out of work by the Inter-secretariat Working Group on Agriculture and Rural Indicators (IWG.AGRI). This had as its participating organisations the United Nations Economic Commission for Europe (UNECE), the Organisation for Economic Co-operation and Development (OECD), the Food and Agriculture Organization of the United Nations (FAO), and the Statistical Office of the European Community (Eurostat).

In 2003 the IWG.AGRI agreed to set up a Task Force on Rural Development Statistics and Agriculture Household Income with a membership consisting of experts from IWG.AGRI, the World Bank, national statistical offices known to be active in these areas, and academia. This initiative was endorsed by the Joint UNECE/Eurostat/FAO/OECD Meeting on Food and Agriculture Statistics that took place in Geneva in July 2003. Subsequently, it was approved by the UN Conference of European Statisticians (CES). Drafting the Handbook began in 2003. All members of the Task Force participated in their individual capacity as experts without necessarily committing their employers or organizations. Over the period of establishing the outline of the Handbook and the preparation of text the IWG.AGRI Task Force met five times: Washington (October 2003), Rome (October 2003), Paris (November 2003), Verona (July 2004), Wye (April 2005) and Rome (June 2005). The Joint UNECE/Eurostat/FAO/OECD Meeting on Food and Agriculture Statistics, which also took place in Rome in June 2005, endorsed the Handbook and asked the IWG.AGRI to have it disseminated in the autumn 2005. The first edition of the Handbook was published, on the responsibility of the secretariats of the participating organizations of IWG.AGRI, in 2005 in electronic form hosted on the FAO and UNECE websites. In 2007 in a hard-copy version by the UN Economic Commission for Europe) was published; this afforded opportunity to make minor corrections and achieve a greater standardisation of editorial conventions across chapters. This text formed the basis of the second edition, the production of which is described below.

The first edition carried the disclaimer that the designations employed and the presentations of the material in this publication did not imply the expression of any opinion on the part of the secretariats of the participating organizations of the IWG.AGRI concerning the legal status of any country, territory, city or area, or of its authorities, or concerning delimitation of its frontier or boundaries.

DESIGNATION OF THE TASK FORCE AS THE WYE GROUP

In 2002, PennState University (United States), the Economic Research Service of the U.S. Department of Agriculture, and the Department of Agriculture Sciences of the Imperial College London organized a *Workshop on the Farm Household-Firm Unit: Its importance in agriculture and implications for statistics*. This was held at the Wye (Kent, UK) campus of Imperial College. The IWG.AGRI participated actively in the Workshop. The issues raised had previously been recognized in a number of UNECE/Eurostat/FAO/OECD meetings on agriculture statistics as well as in the Second International Conference on Agriculture Statistics (the CAESAR Conference in Rome, 2001) as having a very high priority. All concerned parties agreed on the need to bring knowledge together and produce the Handbook.

In view of the catalyzing effect that the 2002 Wye Workshop had and the important progress made at the 2005 Working Group meeting in Wye, the Working Group agreed to name the Handbook;

> *The Wye Group:*
> *Handbook on Rural Households' Livelihood and Well-Being:*
> *Statistics on Rural Development and Agriculture Household Income.*

ESTABLISHMENT OF THE WYE CITY GROUP

At a final meeting of IWG.AGRI in Paris in June 2006, it was agreed that it would be desirable to establish a new framework under which discussions of implementation of the handbook's method could be carried out, with the possibility of revisions as indicated to the handbook itself. Steps were taken to establish the Wye Group as a City Group under the UN Statistical Commission (UNSC). This proposal was accepted at the 38th UNSC session in February 2007.

According to its Terms of Reference, the Wye (City) Group has as its main objective the promotion of the refinement and adoption of international standards in statistics for rural areas and agricultural household incomes. Within this broad mandate, the city group would:

- Consider challenges to consistency of adoption of comparable methods of data collection across countries,
- Give special focus to the application and value of the data standards in developing countries, especially as it may support the construction of indicators for the Millennium Development Goals,
- Assess and explore the potential for the use of improved statistics as policy-relevant indicators and in empirical analysis of policies for farm and rural households, natural resources, and regional economic development, and
- Determine the need for any changes or updating to the handbook and, if indicated, organize and execute the revision.

One of the main outputs from the Wye Group was to be a revision of the 2005 handbook, if deemed appropriate. The other was published proceedings from periodic meetings that reflect interests in the implementation of consistent methods for rural data collection and their use in policy analysis.

It was agreed that the work programme would continue until spring 2011, allowing time both for the ongoing discussion of implementation and the revision of the handbook, if any.

Meetings of the Wye Group, under its new manifestation as a formal UN City Group, were held in York (UK) in May 2008, in Rome (June 2009) and in Washington (May 2010). The York meeting identified the need to extend and deepen the coverage of statistics in developing countries; these had been included in the first edition of the Handbook, but the decision to do so was taken at a fairly late stage and the material was in consequence less detailed than for OECD countries. The 2009 Rome meeting considered how to take the preparation of a second edition forward, including the designation of two general editors and establishing a process by which contributions would be invited from experts to update and expand the Handbook. A small Editorial Group was set up to work on the Handbook, with a larger group to steer the activities of the Wye Group, in particular the design of the 2010 meeting to be held in Washington. Papers from the York, Rome and Washington meetings were intended to provide background material and, in some instances, leading to new text for the Handbook where gaps existed.

Before the 2009 Rome meeting the intention was to conduct two separate exercises. The first was an updating of the existing Handbook. The second was to construct a supplementary publication to cover the statistical needs of developing countries. When work started, in late 2009, it soon became clear that it would be more preferable by far to combine the activities. On the proposal of the two main editors, the Editorial Group agreed that a structure would be adopted in which there was a central Core Text, applicable to all countries. This was to be accompanied by Focus Pieces, outside the Core Text but linked to it, which dealt with the specific situations in OECD countries and (separately) developing countries. Focus Pieces might also be used for other matters too detailed to include in the Core Text. In addition, links were to be provided to other literature (typically papers presented at Wye Group meetings but also some official documents and other published material) that might prove of interest to readers of the Handbook. Such a structure was particularly suited to the format that had been agreed in Rome 2009 – a web-based electronic document with integral links, so that a reader could follow parts of the Handbook of particular interest without having to contend with a mass of text that was not directly relevant.

The Editorial Group also accepted the proposal from the general editors that some rearrangement of the Handbook material would be desirable. In particular, this involved splitting Chapter III (with appropriate renumbering), absorbing the contents of Chapter VII into earlier chapters, and transforming Annexes into Focus Pieces for the chapters to which they relate.

Discussions at the 2010 Washington meeting of the Wye Group had identified a number of specific issues that required inclusion, including gender, well-being indicators other than income and wealth, and the *Global Strategy to Improve Agricultural and Rural Statistics*. The Washington meeting also introduced a system of assistant editors at Chapter level, rounds of invitations to express interest in making contributions, and a peer-review system as an aid to quality control.

As work progressed, files of documents were stored centrally by FAO in Rome. FAO also provided a secretariat and assistance to the general editors in the form of two interns, who undertook many tasks to progress the Handbook, including a preliminary mapping for selecting Focus Piece material, obtaining additional text, suggesting additional references, and formatting text to a common standard. The FAO also organised a series of regular telephone conferences for the Editorial Group by which progress was monitored and actions confirmed. The Economic Research Service of the US Department of Agriculture provided the necessary expertise to enable the Handbook to be available as a web-based document, sections of which could also be printed when needed.

Thus the process of updating and expanding the Handbook involved (a) selecting a Core from the existing Handbook material; (b) updating, expanding and editing the Core in response to comments invited from Wye Group members and on the initiative of the editorial team; (c) in a similar way, identifying Focus Pieces for OECD countries in the existing material and updating, expanding and editing as necessary; (e) identifying Focus Pieces for developing countries and providing appropriate edited text; (f) circulating text to chapter editors for their comments and suggestion, and incorporating them; (g) subjecting chapters to peer-review and reacting to comments; (h) formatting

the completed text; (i) final reading and adjustment by the general editors; (j) passing of finalised text to the ERS for transforming into a web-based document.

By September 2010 work was sufficiently advanced for a paper describing the new edition of the Handbook to be presented at the fifth International Conference of Agricultural Statisticians held in Kampala in October 2010, together with some demonstration chapters. Work continued in the first half of 2011. The second edition of the Handbook, now with a simplified title, was made available as provisional text for comment by its contributors and members of the Wye Group in June 2011, and was launched as a public document in November, 2011.

Though the present edition is now complete, this Handbook should be regarded as "work-in-progress". As policy for rural development evolves and needs for new statistics are revealed, as wider recognition is given to the role of the household of farm operators in agricultural policy and more refined data are demanded, as research expands, and as the *Global Strategy to Improve Agricultural and Rural Statistics* is implemented, it is inevitable that possibilities for improving the present text will become apparent. This Handbook is thus only a provisional document in the pursuit of better statistics on rural development and agricultural household incomes.

ACKNOWLEDGEMENTS

THE 2005/2007 EDITION OF THE HANDBOOK

The first (2005/2007) edition of the Handbook acknowledged the major contributions made by all the experts of the Task Force in its drafting and production (these were listed in its Annex I). The Handbook would not have been possible without the sustained support of Mr. Andreas Lindner (OECD) and Ms. Susan Offutt (Economic Research Service of the US Department of Agriculture). The UNECE Statistical Division acted as the secretariat for the work of the Handbook.

Particular thanks were given to Professor Berkeley Hill (University of London) and Mr. Jan Karlsson (UNECE) who not only acted as the main editors of the Handbook but also drafted many of its chapters. Mr. Neil Rothwell (Statistics Canada) carried out language editing throughout the Handbook and greatly added to its readability.

The principal authors of the chapters of the first edition are given below, though it should be borne in mind that all Task Force members contributed with in-depth comments and amendments to all chapters. It is appropriate to acknowledge these, as their contributions remain central to the revised edition.

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CHAPTER I

INTRODUCTION AND BACKGROUND

I.1 BACKGROUND TO THE HANDBOOK

I.1.1 WHY IS THE HANDBOOK BEING PRODUCED?

Over the past couple of decades rural development has become a priority area for governments and international organizations. The background to setting the priorities may differ between countries.

Among the **developed countries** (relatively high-income economies often referred to in a short-hand way in the present text as the OECD countries) the focus is on how to ensure that people in such areas have good living conditions and opportunities and that rural areas are not de-populated. It also recognized that "*living rural areas*" play an important role for the environment at large and for the recreation and well-being of the urban population. Funding for rural development has so far been channelled mainly through support for agriculture, much of which is aimed at ensuring an equitable income level for the agricultural population. Notwithstanding the fact that the size of the agricultural population is generally small and dwindling[1], this support is of quite remarkable proportions. For example, almost half of the EU budget is still devoted to agriculture, although broader support for rural development has increased recently. Because of this there is a policy need to monitor the income situation of agricultural households both from the perspective of monitoring sectoral performance as well as for its impact on rural development. Some analysts argue, however, that public funding for agriculture is not always a blessing for rural development because it might, when

[1]In the OECD area, national shares of agricultural employment range from over 20% in Turkey, Greece and Mexico to less than 5% in most other countries. However, it should be noted that in addition to farm employment there are many other activities up-stream and down-stream that depend on primary agricultural production (OECD, 1994a), e.g. food processing industries.

production and productivity targets are set, encourage the adoption of labour saving technology, which may exacerbate rural depopulation. Instead, they argue that a proactive rural policy should focus on ensuring equal access and equal quality of education and health and on improving other infrastructures.

The policies and issues described above are of course, to a varying degree, also valid for **developing countries** (again, a term used here in a short-hand way). In addition to these generic agricultural policy elements, many developing countries have a special focus on rural poverty and it is a fact that most of the rural populations are either directly or indirectly dependent on agriculture. In the UN Secretary General's report to the 2003 meeting of the Economic and Social Council (ECOSOC) of the United Nations it was stated that:

> "*Three quarters of the world's poor live in rural areas of developing countries and depend mainly on agriculture and related activities for their livelihood. In 2025, when the majority of the world population is expected to be urban, 60 percent of poverty will still be rural. Thus, the millennium development goals of halving the proportion of people living on less than a dollar a day and the proportion of those who suffer from hunger by 2015 cannot be achieved unless rural poverty is urgently reduced*" (UN, 2003).

The 2008 World Development Report on Agriculture for Development stated that:

> *"In the 21st century, agriculture continues to be a fundamental instrument for sustainable development and poverty reduction. Three of every four poor people in developing countries live in rural areas – 2.1 billion living on less than $2 a day and 880 million on less than $1 a day – and most depend on agriculture for their livelihoods"* (World Bank, 2008).

But this binary division of countries (developed/developing) is too simplistic. In reality there is a spectrum of development, and any consideration of rural and agricultural policies needs to acknowledge this. Many of the most interesting examples exist among countries that are neither very poor nor very affluent.

Having recognized the priority given to rural development policies, it is of course obvious that there is strong demand for statistics and indicators for identifying policy issues, for informing the design and choice of policies, for forecasting, for monitoring outcomes and for evaluating impacts. Policy is likely to be more effective if the design and operation of programmes are based on reliable information about the extent of the problems the policy is attempting to tackle and how they are changing over time.

There is a clear conceptual relationship between the two main issues dealt with in this Handbook – statistics on rural areas, and on the incomes of agricultural households – but it is a complex one. Rural development policy is concerned with the state of rural areas, the economic activities that take place there (of which agriculture is only one, and, in some circumstances, of minor importance), their environmental characteristics, the well-being of people who live there and their social conditions etc.. It is territorially-focussed, and the definition of what is a rural area is critical. Key features of rural areas are their relatively low population density and their greater distance from urban

centres. Agricultural policy is, however, primarily concerned with the activity of producing commodities and services that are by convention classed as agricultural, the use of resources in this activity, and the well-being of producers. Most, but not all, agriculture takes place in areas classed as rural, and thus not all farm households are found there. The relationship between rural and agricultural is explored in detail later. Here it is sufficient to note that confusion may result unless a clear distinction is borne in mind between "rural" (territorially based) and "agricultural" (activity based) statistics. The two terms are orthogonal, in the sense that they refer to concepts in statistics that are independent of each other.

However, there is a clear overlap. Rural statistics are, in part, concerned with describing and quantifying the well-being of rural residents, and agricultural statistics are, in part, concerned with the well-being of people who work in the agricultural industry, most of whom are residents of areas that are deemed to be rural. Although the concept of well-being has multidimensional aspects, it is traditionally measured by economic indicators, such as the level of income, incidence of low income and wealth. Economic indicators provide ways to evaluate how the benefits of national product are distributed across society. However, once a certain level of income is reached; several studies have demonstrated that additional income is not equally followed by an increase in the overall well-being (Nimpagaritse and Culver, 2010).

To a large extent, the concept of well-being is subjective and not easily measurable. Nevertheless, there are some universal measurable needs which are internationally recognized that should be met in order to lead to a life of good quality. The universality of need rests upon the belief that if they are not satisfied, harm of some objective kind will result (harm being defined as fundamental disablement in the pursuit of one's vision of good or an impediment to successful social participation). The non-economic aspects of well-being, such as health, education, better housing, etc, are as important as many economic measures and can be interconnected with economic indicators. It is worth noting that increasing attention is being given to impact that the quality of the environment can have on well-being. In the context of rural development, policies are increasingly concerned with the quality of the natural environment because of the benefits it can bring both to rural residents and to people who live in towns but who visit the countryside or encounter it in other ways (such as through improved water and air quality). Furthermore, there is a link between natural amenities and the level of economic activity through, for example, tourism and population movements. Rural policies, particularly in industrialised countries, are increasing aware of this interaction and are concerned with harnessing the synergies it offers.

Focus on the Importance of Natural Amenities

Together, both economic and non-economic indicators can provide an enhanced comprehensive description of the well-being of society and individuals as well as measuring progress over time. Some of these economic and non-economic indicators are illustrated in Figure I.1.

FIGURE I.1
Selected Areas of Well-Being

Source: *Human Resources and Skills Development Canada*

In OECD countries a marked contrast exists between the provision of statistics for, on the one hand, agriculture as an economic activity and, on the other, rural policy. In most OECD countries there is a strong and long-established system of **agricultural statistics**, with government agricultural departments often acting as the supplier as well as the main user. The basic data have come from a range of surveys and (increasingly) administrative records. The conventional focus of agricultural statistics has been quite narrow, concentrating on the production of agricultural commodities (volumes, prices, values etc.), the use of resources in this process (variable inputs, labour, land etc.) and the residual rewards. In many countries the statistical systems have been slow to recognise that household-firms, that comprise the numerically dominant form of institutional unit in farming, are increasingly engaged in other economic activities, which they combine with agriculture in various ways (Hill, 2000).

In contrast, until very recently territorially-based **statistics for rural areas** in OECD countries have been weaker and highly fragmented (Hill, 2003). Though the term "rural statistics" is commonly used as a short-hand term (including in this Handbook), this can be misleading as it suggests there is something unique about what they contain – their rural dimension. It is preferable to keep in mind that what such statistics show are the characteristics of areas that are classed as rural and how they differ from those of other areas in ways that attract policy attention. This implies that statistics for areas that happen to be rural form a subset of what is available for all areas. It is clear that such statistics must go **beyond agriculture** and cover many economic, social and environmental parameters for residents, businesses and resources.

An explanation for the relative lack of development of territorially-based, multi-dimensional statistics for rural (and non-rural) areas is likely to reflect the later start of this type of policy intervention and the tendency for general policies (education, health,

social security etc.) to be administered sectorally and with their associated statistics broken down geographically in ways that suit particular purposes and administrative systems. Often there has been no government department or institution holding the responsibility for assembling small-area statistics from across multiple policies on a consistent basis, so commentators on rural conditions have found themselves gathering data from a wide range of sources – official statistics as well as many different non-official or private sources – many of which are not comparable, particularly in terms of the territorial unit to which they relate[2]. Nevertheless, progress has been made in some countries. Current examples of systems of statistics for rural areas in OECD countries based on a variety of territorial units are described later in this Handbook.

In **developing countries** the situation on agricultural and rural statistics is less satisfactory and, worryingly, appears to have deteriorated. This is reflected in response rates to FAO questionnaires as well as other assessments of statistical capacity. While the uses for such statistics have been developing, the ability of statistical systems to respond has generally declined and the fall off is particularly evident in Africa. This situation has led to the development of the *Global Strategy to Improve Agricultural and Rural Statistics* (World Bank *et al*, 2011). Though prepared under the auspices of the UN Statistical Commission, this *Global Strategy* is. the result of cooperation between many international organisations. The purpose is to provide the framework for national and international statistical systems to produce the basic data and information to guide decision-making required in the 21st century. This Strategy is based on three pillars:

1. The establishment of a minimum set of core data that countries will collect to meet current and emerging demands;
2. The integration of agriculture into national statistical systems in order to satisfy the demands of policy makers and other users who rely on comparable data across locations and over the time;
3. The sustainability of agriculture statistics system through governance and statistical capacity building.

Though the preparation of this Handbook's first edition predated the *Global Strategy* it is obvious that they share much common purpose and are complementary, in that the Handbook deals with some specific issues that lie within the *Global Strategy* and carries them forward. At the same time, the Handbook does not attempt to cover all the areas of statistics and issues (such as the relationship between agricultural statistics and broader national statistical systems) that fall within the concerns of the *Global Strategy*.

Part I of the present Handbook illustrates some key steps in setting up **a system of statistics for rural areas** (or "rural statistics" if this is understood as a short-hand term). While *ad hoc* research exercises that collect data and publish results relevant to specific policy aims have value, particularly when there is an information vacuum, these are likely to involve many different sets of definitions and approaches, preventing easy integration and synthesis. Methodology designed for a single purpose is unlikely to be

[2]Official statistics are a specialised form of quantitative information; their distinguishing characteristics being that they are generated by the public sector, involve data collection, and are typically repeated at intervals. Principles of quality in public statistics can be summarised as relevance, objectivity, transparency, accuracy, timeliness, comparability over time, and accessibility (Hill, 2003).

well suited for others. In contrast, what was looked for here was the basis of a system for rural statistics in which there is a degree of commonality of methodology that permits the combination of data sources. Such a system, which probably needs to be built up over time, is intended to be capable of providing answers to a range of policy questions by the flexible use of accumulated data.

In assembling such a system of rural statistics five main issues need to be addressed. These are:

- **Coverage of rural statistics**, in the sense of determining what aspects of rural areas should be described, what are the appropriate indicators for each, and consequently what data are needed.
- **Finding what data exist, who are the owners, and how they are accessed.** Comparing this list with what is needed gives an idea of where gaps in data exist, which in turn can lead to proposals for filling them.
- **Choice of variables, time periods and basic geographic units** for data aggregation, and the classification of these units into rural and non-rural.
- **Data acquisition and management**: reviewing organisational issues that need to be addressed when considering the establishment of a system of rural statistics by bringing together data sets from across government.
- **Structure for the management** of the statistical collection, tabulation and publication of the statistics.

Part II of the Handbook, which deals with the specific subject of producing statistics on the income situation of agricultural households, tackles a further set of issues. These include:

- **Defining the household** in terms of the membership and the criteria for belonging to it, which determine the individuals whose incomes are aggregated when creating income indicators at the household level.
- **Classification of households** into those that are agricultural and those that belong to other socio-professional groups.
- **Defining income** for which measurement is to take place (total income, disposable income, money income etc.) and, where statistics on wealth are to be produced, the appropriate concept to be used.

International organizations have already done a considerable amount of work on rural statistics. In a series of reports starting as early as in the middle of the 1980s, **OECD** has developed a system for international rural development statistics (see list of references). Not all of this, however, is applicable to developing countries. These have received attention from the **United Nations**, **FAO,** and the **World Bank**, among others, of which the *Global Strategy* (World Bank *et al*., 2010) is a recent example. In the more specialised area of statistics on the income situation of agricultural households, **Eurostat** has constructed a methodology that has tackled many of the issues that would need attention in producing reliable statistics and has tested the feasibility of obtaining microeconomic data. **OECD** has reviewed what information exists on farm household income and has highlighted the differences between approaches and definitions that are found among its member countries. In particular the **Canberra Group** of experts on household income statistics (comprising *inter alia* representatives of the **Luxembourg**

Income Study [LIS], Eurostat, the **International Labour Office [ILO],** OECD and the World Bank), have developed and published recommendations that, while not dealing explicitly with agricultural households, are likely to form the methodological foundation of future international work, and this Handbook has taken due regard of these proposals (Canberra Group, 2001).

As for **national organizations** – national statistical offices and other agencies responsible for monitoring rural development – there are **large differences** between countries concerning the definition of rural areas, choice and definition of indicators as well as how far they have moved towards setting up a system of rural development statistics. In this context the issue of **scope** is becoming increasingly important. Most countries think of their statistical programme in a national sense. The emergence of the global economy and cross-border environmental concerns means that statisticians increasingly need to consider the international situation. In simple terms, data need to be additive and comparable across countries, which means that the basic metadata must be the same. A similar disparity of approach is experienced at national level with regards to statistics on agricultural household incomes, though within the European Union the basis of a harmonised methodology now exists (though in a macroeconomic form that is no longer operational, but which has potential for application using microeconomic data).

The **objective** of this Handbook is to **consolidate** work done by international organizations, **highlight** where differences occur and as far possible to **fill gaps**. A special focus is also put on the **quality** of rural statistics and indicators, including those relating to the income of agricultural households. A salient feature of rural areas and their associated problems is that they can differ very significantly not only between countries but also within the same country. It is therefore not advisable to prepare a handbook that is prescriptive but rather one that, through drawing on international and national experiences, can **highlight good practices**. At a practical level, a secondary objective is to make an **inventory** of national rural development statistics, with a particular focus on income measures. The overarching aim is to enable the **benchmarking** of ways of collecting data and constructing indicators so that they can be used to assist policy discussion and design.

I.1.2 WHO IS THE HANDBOOK INTENDED FOR?

International handbooks in the field of economic statistics have traditionally been intended to provide guidance about concepts, definitions, classifications, coverage, valuation, the recording of data, aggregation procedures, formulae, etc. They have been intended mainly to **assist compilers of the relevant statistics** in individual countries. This Handbook has the same principal objective.

The Handbook is also intended for the benefit of a **wide range of users of rural development statistics and of household income measures**, such as government and academic economists and policy analysts, regional and local agencies and their experts and participants in multilateral trade negotiations on agriculture. Rural statistics and income measures provide key information for policy purposes. They attract a great deal of attention from the media, governments and the public at large in most countries. This Handbook is therefore also intended to promote greater understanding of the properties

of these statistics, what they are attempting to measure and the underlying economic and statistical theory.

The resulting Handbook is unavoidably voluminous. As the various kinds of readers may have different interests and priorities, it is not possible to devise a sequence that suits all. Many readers may be interested in only a selection of chapters. This applies in particular to material that relates to OECD countries or to developing countries, where the issues may be rather different. Consequently the revisions that took place in 2010 have included rearranging the text into that which constitutes a common core, applicable generally whatever the country's stage of economic development, and material that relates to more specific situations. Hyperlinks give easy access to this non-core text. The way all the material relates is evident from the Table of Contents.

I.1.3 THE ROLE OF STATISTICS

It is generally accepted that **statistics should be policy driven**. In a first step, statistics have to provide all necessary elements allowing policy makers to analyse the situation easily and correctly in order to identify policy needs. In a second step, once policies have been formulated, statistics have the function of monitoring the effects and evaluating the impacts of specific policies. This allows policy makers, in turn, to review policies and to adapt them if necessary.

In the ideal case – for step two – statisticians should be able to provide, as quickly as possible, the necessary elements to policy makers to confirm their general policies or to warn them that certain policy measures do not show the desired effect(s). This calls for quickly reacting indicators.

The quality of indicators

Statistical indicators are the tools that allow the formulation of policies and the monitoring of changes/development/progress of those policies. Indicators should fulfil the following criteria:

- They should be relevant;
- they should be simple and easily understandable;
- they should be problem oriented;
- they should be clearly defined;
- they should be based on consistent statistical units;
- they should result in conclusions easily communicated to policy makers;
- in the ideal case, they should react rapidly to changing situations.

However, the selection of indicators will always be a **compromise** because:

- They often depend on available data, because financial resources are limited in almost all countries. Therefore it is necessary to exploit all kinds of available data and sources in the first place.
- Priority is often given to indicators that are capable of assisting in the routine monitoring of policies. For example, policies addressing rural development for a whole country have to describe problems/targets common to all rural areas of

that country. Indicators addressing specific problems for particular rural areas are less likely to be developed.

There is a broad spectrum of issues to be assessed within the social, economic and environmental fields of rural development. It could be argued that any indicator at the national level could be developed for rural areas.

The number of indicators and the data required to compute them can grow rapidly. Even though there will always be good reasons for which the list of indicators needs to be expanded, there are also good reasons for starting small and making use of whatever data are available before collecting more. The publication *"Tracking results in agriculture and rural development in less-than-ideal conditions. A sourcebook of indicators for monitoring and evaluation"* (FAO *et al.*, 2008) strongly encourages the idea of integrating statistical capacity building into national Monitoring and Evaluation (M&E) programmes from the beginning, so as to ensure a reliable supply of core statistics from which the required indicators can be extracted.

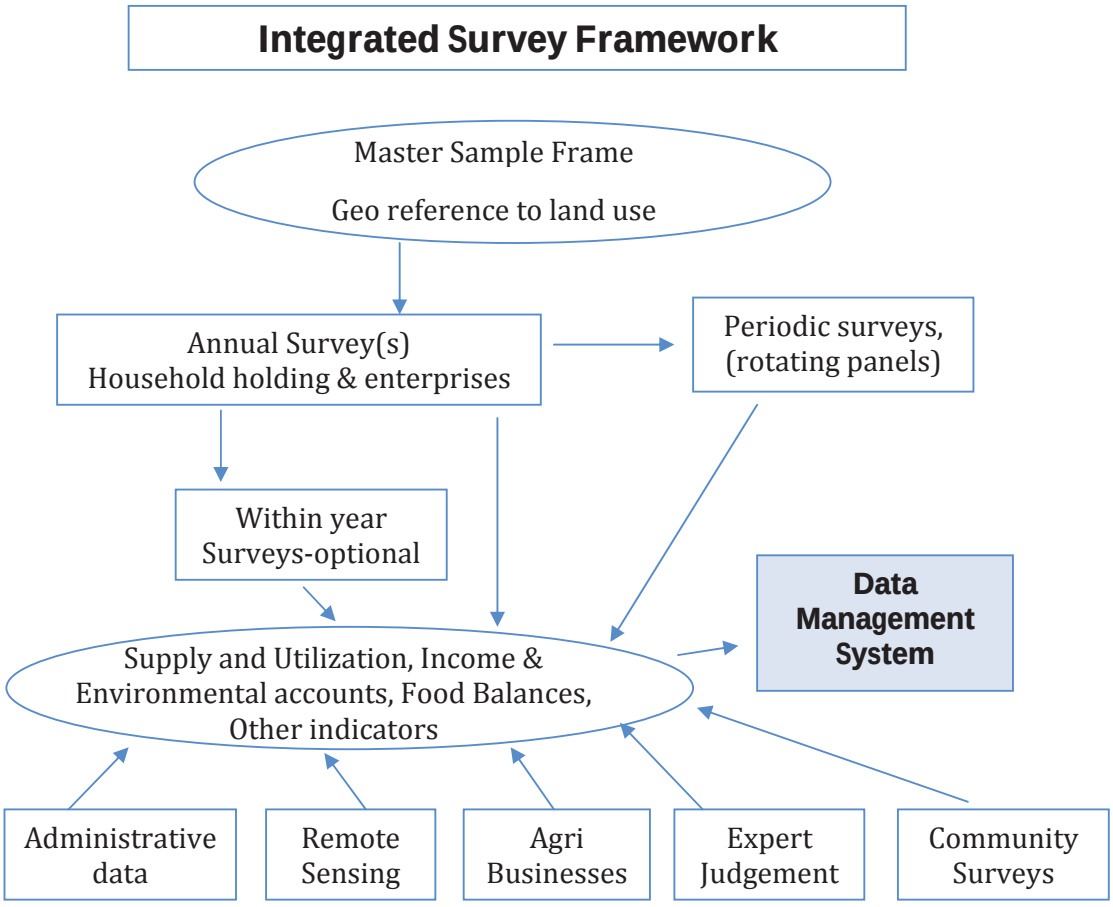
Data sources to be used

The basic information for indicators for rural development and agricultural household income could originate from a variety of sources, each having their own advantages and disadvantages. **Censuses** give very useful information because the sample size is generally large (perhaps a total coverage). But normally censuses are performed only periodically and are separated by large time intervals, which make it difficult to construct appropriate time series. Nevertheless, they are very helpful in establishing a base line. **Sample surveys** are normally carried out with a higher frequency but the sample size makes it difficult to draw conclusions for small geographical units because the statistical significance is not good enough (e.g. the EU Labour Force Survey mainly gives statistically relevant results for NUTS2 areas)[3]. **Remote sensing** is increasingly seen as a tool of data collection. The use of **administrative data** for the purposes of generating rural development indicators is not that common yet but it seems that their importance is growing, and tax records are already used in some countries to generate income data for farm operators. If the relevant registers are well kept and also well linked this is a very powerful tool. **Geo-referencing of data**, more a mechanism for linking data from different sources rather than a source of statistics in its own right, can be very helpful in the calculation of certain indicators. While there are some limitations on geo–referencing, recent technological and technical developments mean that its use is now within the capacity of almost all countries regardless of their level of development.

The *Global Strategy* promotes the use of an integrated survey framework in order to improve basic statistics and methodology. The integration enables the concentration of resources from different sources and removes the duplication of efforts to produce statistics. It provides the framework to achieve the integration based on the development of a master frame for agriculture, its use in an integrated survey system, and the implementation of a data management system. It also defines the following steps to implement an integrated survey framework (see Figure I.2).

[3]NUTS = Nomenclature of Statistical Territorial Units

FIGURE I.2
The overall integrated data system



The geographical unit/reporting unit

In order to combine information from different sources the statistical reporting unit has to be defined. This has to be the same for all information used, be it a census, a survey or administrative data. Examples of a consistent unit are the individuals (using a personal identity number) that enable various datasets to be combined in the income statistics registers of several Scandinavian countries, and the Geographic Information System (GIS) locator that can bring physical and environmental data together (as practiced in the UK). For comparability purposes, it is necessary to be able to define and delimit rural areas so that, for example, the employment rates or incomes of rural households can be compared with those of urban dwellers. The ways of defining and applying definitions of rural are described in a later chapter.

I.2 WHAT IS RURAL DEVELOPMENT AND WHY IS IT A POLICY AREA?

The starting point for statistics intended to inform decision-makers and other stakeholders must be the nature of the underlying policies. Some attention therefore has to be given at the outset to what constitutes rural development and the problems that it is attempting to address.

Rural development used to be a sectoral issue with agriculture as the main focus. In many developing countries agriculture is still the corner stone of the rural economy. In OECD countries, on the other hand, rural development has more and more become a **territorial concept**, dealing with spatial differences in problems and perspectives, opportunities and options (OECD 1995, 2006). It is also a **multi-sectoral concept**, concerned with a wide range of demographic, economic, social and environmental issues. It stresses the importance of cross-sectoral, horizontal integration of activities and policies. Finally, rural development is a **dynamic concept**, concerned with medium to long term changes and adjustments in technology and ecology, economy and society. Rural indicator should therefore provide information on a variety of economic and social factors.

A large part of rural development is concerned with a process of ensuring that the population distribution doesn't get too skewed towards urban areas. To prevent this, analyses of **demographic pressures**, **employment**, **job creation** and **economic well-being** are of course issues at the forefront of rural development. Rural development policies are important elements within the overall package of long-term national development strategies that can preserve employment and create new jobs and thus prevent de-population of whole areas. However, there has also been a recent shift in thinking away from the idea of development as a process mainly or entirely linked with **economic growth** to one based on increases in the **quality of life**. In fact, some rural areas contribute to the quality of life of society as a whole because they contain important public or quasi-public goods such as a **clean environment**, **attractive landscapes** and **cultural heritage** (OECD, 2001). This broader approach is reflected in the *Global Strategy*, the conceptual framework of which embraces economic, social and environmental dimensions.

In the poorest developing countries the immediate focus of rural development policy is on poverty reduction and on ensuring that the rural population has access to basic services, as economies grow and become more complex the policy focus inevitably becomes more diverse. The World Bank, for example, addresses agricultural and rural development through five main areas: 1) fostering an enabling environment for broad-based growth; 2) enhancing agricultural productivity and competitiveness; 3) fostering non-farm economic growth; 4) improving social well-being, managing risk and reducing vulnerability; and 5) enhancing the sustainability of natural resources (World Bank, 2002).

A major concern for policy in all countries is that the problems faced by the rural population are as diverse as the rural areas themselves. Rural development policy, therefore, has to be linked to its environment and its context. The well-being of rural

people is also more affected by exogenous factors outside the control of governments such as climate, than their urban counterparts. The data requirements of dealing with these two sets of issues generates particular problems for statisticians concerned with collecting and compiling rural statistics. While the context may be different, therefore, there is considerable commonality in the problems faced in OECD countries and in developing countries.

Focus on Common Problems of Rural Areas in OECD Countries

Focus on Common Problems in Rural Areas in Developing Countries

I.3 RURAL DEVELOPMENT – POLICY OBJECTIVES

Policies are normally designed to solve identified problems or, if a proactive approach is chosen, to avoid certain problems from developing. Looking at the "typical" problems of rural areas in the past decades, rural development policies normally aim to make rural places **economically, socially, culturally and environmentally healthy**. A successful rural development policy may be seen as one that should allow rural areas to:

- Maintain their population and within it a viable population age structure.
- Diversify their economic base beyond the primary sector, maintaining or even increasing employment rates to absorb the loss of jobs in the primary sector.
- Be able to keep poverty rates and unemployment rates on a level no worse than those in urban areas. They should also aim at offering job opportunities for women and young people[4].
- Be as easily accessible as possible and provide a minimum set of services. This means they should be well connected with neighbouring areas, which is the basis of tourism/recreation related industries. The provision of easy access to education, health care etc. for the local population is also required to maintain the attractiveness of living in the local area.
- Keep property ownership widely spread. The rate of locally financed and initiated new small enterprise start-ups should be relatively high.

[4]The term "youth" applies to persons between 15 and 24 years old (ILO, 2004). The ILO (2004) report focuses on policymaking, the overview of the position of youth in the labour market as well as the discussion of the causes of the problems and disadvantages they face. For more extensive analysis of these issues, see O'Higgins (2001) and Blanchflower (1999).
http://www.ilo.org/public/english/employment/strat/yen/download/guidelines.pdf
For more information about the central features of the Secretary-General's "Youth Employment Network," created following the Millennium Summit, and which is a partnership between the UN, the World Bank and the ILO, see http://www.ilo.org/public/english/employment/strat/yen/ .
Finally, see article 2 of the ILO Convention No.182 on "Worst Forms of Child Labour Convention" which states: "For the purposes of this Convention, the term "child" shall apply to all persons under the age of 18."
http://home.iprolink.ch/fitbb/TRADE_UNION_RIGHTS/ILO_Convention_182.html

- Keep the physical and mental health of the rural population as good as it is elsewhere.
- Make their key players work together towards common goals with an agreed value basis. The goals and values are set using a bottom-up approach. The local government should be empowered with reasonable fiscal and decision-making autonomy.
- Be responsible for their own development and not have it done by others.

The first part of this Handbook (from Chapters II to VII) is devoted to issues in the generation of statistics appropriate for use in the context of rural development. The second part deals with the more specific measurement of the incomes and wealth of agricultural households. Some explanation of this is needed at this stage.

I.4 WHY A PARTICULAR FOCUS ON AGRICULTURE HOUSEHOLD INCOME AND WEALTH?

Agricultural households demand special attention when information on rural areas is collected for at least the following reasons:

1. Historically agriculture has been a major activity of the people that live in rural areas. While the proportion of rural residents working primarily in agriculture has declined to low levels in many of the richer industrialised countries (often less than 10%), the share is still substantial elsewhere. Similarly, the share of total income accruing to rural residents from agriculture is typically small in OECD countries, but is still important in others. Agriculture typically accounts for a substantial share of the nation's land use, so that its role in rural development is likely to carry major implications for environmental concerns and landscape characteristics.

2. The structure of the agricultural industry of most countries at all levels of economic development is dominated, in terms of numbers, by firms owned and operated by households (household-firms or small-holders in developing countries)[5]. These combine the economic functions of production and consumption and are, at the same time, social units. In many industrialised countries their numbers have been in long-term decline as the treadmill of technology lowers the real prices of agricultural commodities and makes the smaller farms unviable, in the sense that they are no longer capable of being the sole source of livelihood for their operator's household (Eurostat, 2002). In some countries that have experienced histories of socialised or collectivised agriculture the role played by other forms of institutional unit (taking a variety of legal forms but characteristically large-scale in operation) is greater, but even there production by households often accounts for significant amounts of national output of commodities that can be produced on household plots.

[5]According to the EU Survey of the Structure of Agricultural Holdings (Farm Structure Survey) "Natural persons" accounted for the operation of 96% of EUR15 holdings in 2000. Only one country was below 90% – France (83%). Eurostat (various years).

3. Agricultural households are a major source of the factors of production whose reallocation is an integral part of rural development. These households are often a source of labour to assist the growth of other industries, so the factors that lead to out-migration of labour from agriculture, such as comparatively lower incomes, need monitoring. As major agents of change, particular attention has to be given to the characteristics of agricultural households, including the composition of their incomes (which will reflect the extent to which they are already diversified into non-agricultural activities, both those found on the farm and off the farm) and the way that these characteristics are changing.
4. In many developing countries, but also in some European ones, there is a significant portion of the agriculture population that can be characterized as constituting a pool of hidden unemployment and whose contribution to overall agricultural output may be marginal. In the absence of other employment activities they, probably rationally, prefer to stay on their own farm or on the farm of someone else. In Poland, for instance, the number of persons working on private farms and considered redundant amounted to about 420,000 individuals, which is equivalent to almost 21% of the rural population employed in agriculture (Wikowski, 2004). Hidden unemployment primarily exists in small farms with less than five hectares (about 60% of all farms in Poland) and among persons aged 45 and above.
5. Policy for rural development has often grown out of agricultural policy. Spending on agriculture, mostly received by farm households, is still a dominant strand in policy intervention in rural areas. Even recent initiatives to promote rural development (such as the EU's Rural Development Regulations 1257/1999 and 1698/2005) often focus on farm households as the principal agent for stimulating economic, social and environmental development. In developing countries, the link between rural and agricultural policy is also strong, with a focus on increasing productivity, food production and food security, as well as social concerns.
6. In OECD countries support provided to agriculture by government interventions is typically reflected in the value of land, the factor of production least elastic in supply. Capital gains constitute a form of income (especially when viewed retrospectively over a lifetime) that is typically taxed relatively lightly. Capitalised support also leads to the situation in many countries where the value of land is high relative to the income that can be earned from it. Consequently, the beneficiaries may be the owners of land rather than the operators of the farms. Where the farmer is also the landowner, this may not really matter (though there may be implications for the amounts of tax paid). However, where land is owned separately, the main beneficiary may be the landlord even though policy is intended to mainly to benefit the farm operator.
7. In developing countries the situation can be rather different. For land to have a market value systems of property rights have to exist. In some developing countries, where there has been extensive land reforms, farmers have land titles and can use the value of their land as collateral for loans, which can foster economic development. Elsewhere more traditional forms of land tenure may be common with little or no registration of titles. In these circumstances it may be difficult to place a value on land, though local land markets may operate to some extent.

I.5 AGRICULTURE HOUSEHOLDS, THEIR INCOMES AND POLICY OBJECTIVES

Agricultural households are important to policies directed at rural areas in two ways. First, they often form a **direct target group** of agricultural and rural development policies. In particular, concern with the living standards of the agricultural community (which comprises agricultural households), or the incomes that give rise to those living standards, is often a central objective (see review in Hill, 2000) and plays a major role in the discussion of the reform of policy (see for instance the Special Report No.14/003 by the European Court of Auditors, 2003). Examples can be found among OECD countries in which clear objectives are set for agricultural policy in terms of the relative income of farmers compared with other groups in society, of less detailed expressions that imply comparisons or at least the avoidance of poverty among farm families, and where the aim is to create the conditions in which satisfactory incomes can be generated by competitive producers and unacceptable instability prevented. In developing countries the alleviation of poverty is central to rural policy, where agriculture is often still the main occupation of the population. The centrality of the "income objective" of agricultural policy alone would justify the development of statistics on the household incomes of farmers and their households to service that policy.

Second, agricultural households play a major part in achieving the other aims of agricultural and rural development policies because they **control production and the use of resources**. Their response to policy signals is what determines the overall outcome of the intervention. Understanding the economic situation of agricultural households is now recognised as a key element in designing and applying policy for agriculture and rural areas (Offutt, 2002; OECD, 2002). Though, as will become evident, statistics for agricultural households are not fully developed, sufficient evidence exists to demonstrate the great policy relevance of this information.

In developing countries, agricultural households are a focus of policy in a number of regards. As producers, there is a concern to increase productivity and output, as consumers the concern is on food security and the extent to which different households are at risk of being food insecure. There may well also be a concern on the part of governments to limit rural urban migration, by ensuring that there are adequate employment opportunities.

Though agricultural household-firms dominate the industry numerically, a simplistic view of them is both incorrect and harmful to the design of successful policy. They are **highly diverse** in many different dimensions. Attention is often focussed on the variety in size of their agricultural activities (land holdings, outputs, input uses etc.), farming types, performances, degrees of indebtedness etc. – all factors that will be reflected in the income levels from farming. But many households are also engaged in economic activities that are non-agricultural, either as waged employees (dependent activity) or as self-employed entrepreneurs (independent activity). Recently, agricultural policy has broadened in many countries to include actions to diversify the income sources available to farmers, either on the farm or elsewhere, activities that will typically carry implications for the rural economy. Many farm households are already diversified in this way, but there is seen to be room to develop such income further by vocational training,

grants for investment, the provision of advice and so on. Households (and their members) also often receive income from property (rents from land and interest and dividends from financial assets), social transfers (pension etc.) and other sources, though, again, the incidences of these forms of income are far from uniform.

As a consequence, there is wide variation in the dependency of household-firms on agricultural activity, from 100% (with no non-agricultural income) to where farming represents only a minor income source, and in some cases a negative one (a loss). For farm-dependent households the policies directed at agriculture are of obvious importance, but for those toward the other end of the dependency spectrum agricultural policy may have little relevance in terms of their incomes or activities; they will be more influenced by what is happening to non-agricultural parts of the economy, and more general regional and rural development and policies.

The wide variety of circumstances among farm households implies that a satisfactory consideration of their household income must go beyond the sector level, or group average, to include distributional information that reflects their diverse nature (Hill, 2000). It also implies that the analysis of the performance of policy need not always cover all the households that engage, to some extent, in the production of agricultural commodities. For some purposes it may be adequate to concentrate only on those for whom agriculture is the main activity or source of income, or those whose farms are above given size thresholds. Such issues are important when considering the definitions of an agricultural household and when drawing up statistics.

However, sector-level statistics only provide part of the picture. To look at the distribution of income or the incidence of low income among farm households compared to other households, at the change in income over time, and at the impact of agricultural, social and taxation policies, microeconomic data are necessary. These receive attention in the second part of this Handbook.

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Focus on the Importance of Natural Amenities[1]

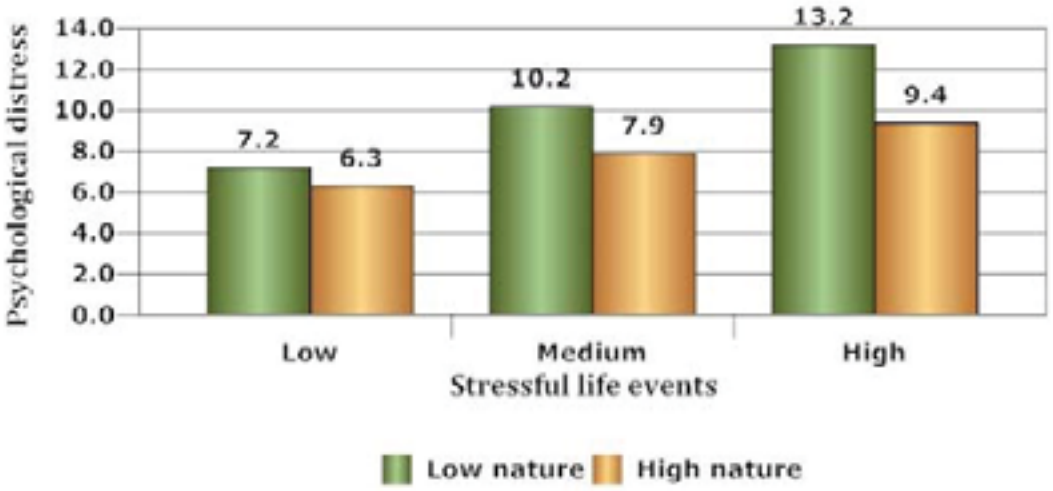
Historically, rural development has depended on the types of industries present in rural regions and their productivity. Increases and declines in rural well-being were outcomes of changes in agriculture, lumbering and mining, and in some cases manufacturing. It is becoming clear, however, that particularly in more industrialized countries, this jobs approach provides only a limited understanding of rural well-being and the importance of rural regions. The growth of rural tourism, second homes, and retirement populations in many rural areas is a strong indication that rural areas hold an appeal that cannot be understood in traditional economic terms. How is one to understand, for instance, why urban residents sink so much time and money into fixing up old farm houses (or building new houses, for that matter) several hours away from their permanent residences? Why does having an additional home to maintain mean relaxation from the stresses of urban life and not simply more stress?

At least part of the answer is provided by environmental psychology, a field that has developed over the past twenty years and that remains largely unknown to economists and regional scientists. The landmark study on the psychological benefits of nature was done by Ulrich (1984), who examined records of patients with a particular type of gall bladder operation in a hospital for a period of 20 years, comparing the records of those who had views of trees from their windows with those whose rooms faced a blank hospital wall. Patients with a view of trees tended to stay in the hospital just as long, but they used substantially less painkillers and made fewer complaints to the nurses' station. In addition to replicating this study, subsequent research has examined health station visits by prisoners, finding that those with cells facing a rural scene outside the prison made fewer visits than those with cells facing inside the prison.

Wells and Evans (2003) have done one of the more interesting non-institutional studies relating nature to stress reduction. For a sample of over 300 children aged eight to ten in rural New York state, Wells and Evans ascertained home exposure to nature with a simple additive scale based on whether there were live plants in the living room, whether there were views of nature from (a) the kitchen and (b) the living room, and whether the home had a grass yard. Using a stressful life events scale, they found that children with high exposure to nature had far fewer symptoms of psychological distress than children with little exposure to nature, taking differences in household income into account (see Focus Figure I.1).

[1]Contribution by David MacGranahan (ERS-USDA).

FOCUS FIGURE I.1
Nature moderates effects of stressful life events on psychological distress



Source: N.M. Wells and G.W. Evans, *Nearby Nature: a Buffer of Life Stress Among Rural Children*, Environment Behaviour 35:3:311-330, 2003.

In short, there is now ample evidence that simple exposure to natural scenery reduces the effects of stressful events on psychological well-being. Other research has shown benefits from exercise or recreation, activities often associated with being in a natural setting. In this context, having a second house in a rural area begins to seem rational. It does not explain why, however, contact with nature should be relaxing.

All countryside is not equally appealing. Years of research on landscape aesthetics, often done in conjunction with public land use planning, have shown that people most prefer landscapes that contain open, traversable vistas, clumps of trees, a water source (pond, lake, or stream), and a hint of mystery – a suggestion that there is more around the corner. These preferred scenes often show up in landscape paintings. For instance, the picture below is in a lobby of the private building in which the US Department of Agriculture's Economic Research Service is currently located. The picture has all the ingredients of a preferred landscape: clumps of trees, a water source, an open vista, and, with a green pathway extending around the corner, a hint of mystery.

These preferences are generally consistent across cultures, but they do not necessarily extend to people who have particular occupational or recreational uses that they make of the land.

For instance, a recent study comparing three groups of people (rural Chinese, design students in China and US design students) found that the preferences of the Chinese design students (even those that were from rural China) were more like the US design students than the rural Chinese (many of whom were presumably farmers). In general, farmers tend to like agricultural scenes more than others. By the same token, foresters like trees to be evenly spaced and of equal size, while the general public prefers forests that look more natural.

The influence of occupation was also evident in a Netherlands study contrasting local farmers, local residents, and visitors (often bicyclists). Farmers clearly thought agrarian land was more beautiful than "half-open swamp" but local non-farm residents were more like visitors in their preference for the latter.

Landscape preference studies have typically been done by asking people to rate pictures of various outdoor scenes. A problem with this approach is that these scenes have varied along several dimensions, so that it is difficult to isolate the important differences. In a recent study of alpine farmland scenery, Hunziker and Kienast digitally altered a single picture, adding and subtracting trees from the scene. This study clearly showed respondents preferences for more forest than there was in the original picture, but not total forestation. Completely cleared land was the least preferred.

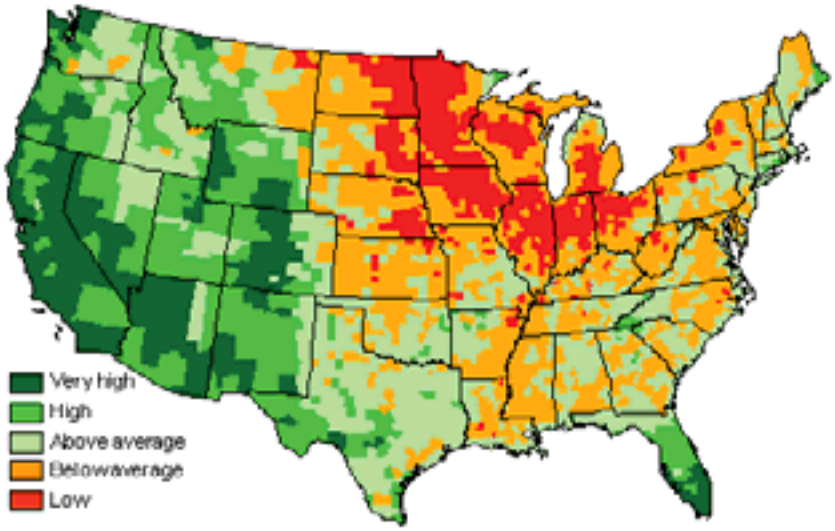
The consistency across cultures has suggested to some that there is a vestigial genetic component to landscape preferences. Preferred landscapes, it is argued, are the landscapes that were most suitable to early humans. Other animal species tend to have

inherently preferred habitats, why not us? While many are skeptical, no convincing alternative explanations have been forthcoming.

Some attempts have been made to measure natural or landscape evaluation in rural areas. Sjerp de Vries and his colleagues at the Landscape Center in Wageningen in the Netherlands have developed GLAM (GIS-based Landscape Appreciation Model) to reflect landscape attractiveness at a very local level. Their measures include: naturalness (largely forest), historical distinctiveness, urbanization (negative) and skyline disturbance (negative). Two other measures, topographical relief and noise level (negative), proved to be redundant in predicting local evaluations of landscape.

McGranahan developed a scale of "natural amenities" for US counties, based on climate measures (warm, sunny winters; cool, low-humidity summers), water area (ponds, lakes, ocean), and topographic variation (relief). Each measure received equal weight in the overall scale, based on results of regression analyses. Areas scoring high on the scale include the Rocky Mountains and the West Coast (see Focus Figure I.2). The lowest scoring areas tend to be the heavily agricultural lands across the centre of the country. Areas with flat, unbroken land, wet winters, and hot humid summers are very good for grains, but tend to inhibit amenity-based development. Counties in the low amenity areas have tended to lose population every decade since 1950. In contrast, high amenity counties have, on average, doubled their populations since 1970.

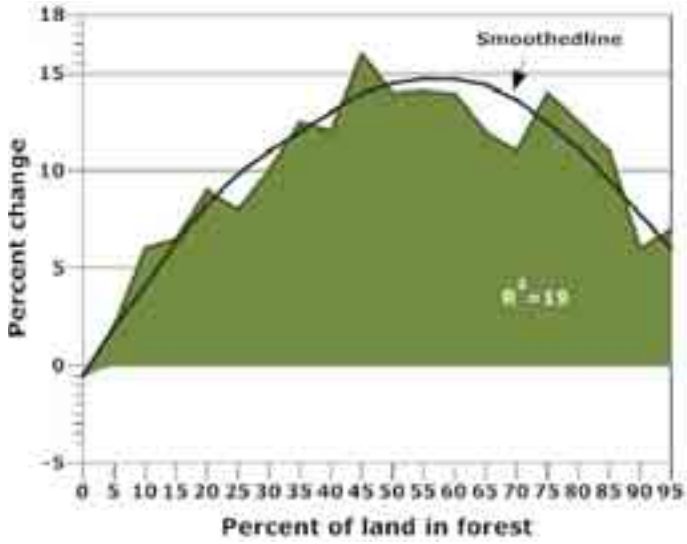
FOCUS FIGURE I.2
Map of U.S. Natural Amenities Scale



Source: D.A. McGranahan, Natural Amenities Drive Rural Population Change, AER-781, Economic Research Service, USDA, Washinghton, DC, 1999

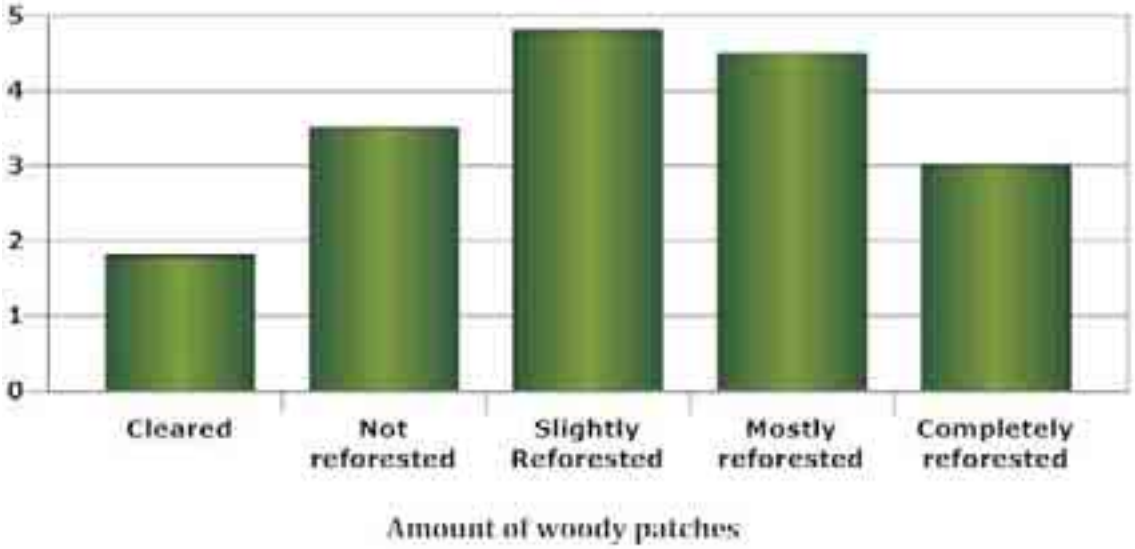
Although forest is correlated with topographical variation, this natural amenities scale does not include land use and there is no measure of forest cover. However, a graph of average county population growth, 1990-2000 by percentage of county land in forest (see Focus Figure I.3) closely resembles the inverted "U" of the Hunziker and Keinast study showing preferences in a Swiss agricultural setting (see Focus Figure I.4). Partially forested counties had the most rapid growth, while counties with no forest lost population and counties almost completely forested had relatively little growth.

FOCUS FIGURE I.3
Land in forest and average rural county population change, 1990-2000



Source: D.A. McGranahan and P. Sullivan, *Farm Programs, Natural Amenities and Rural Development*, Amber Waves 3:1:28-35

FOCUS FIGURE I.4
Preferences in a Swiss agricultural setting



Source: M. Hunziker and F. Kienast, *Potential Impacts of Changing Agricultural Activities on Scienic Beauty: a Prototypical technique for Automated rapid Assessments*, Landscape Ecology 14:161-176, 1999.

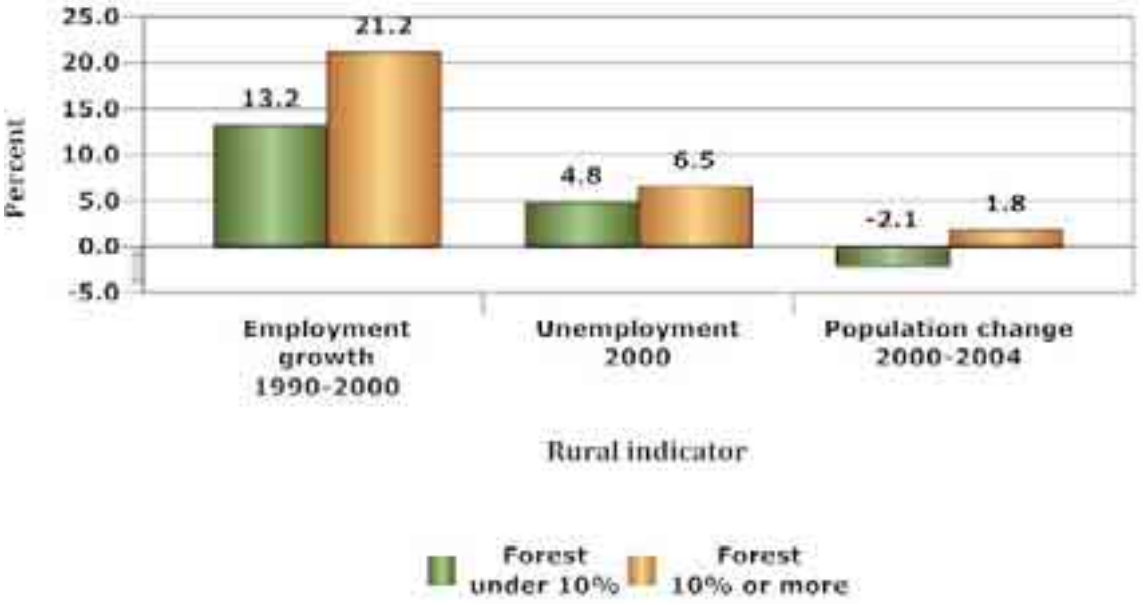
The quality-of-life gains from rural residence, particularly those with attractive landscapes, can generate apparent anomalies in socioeconomic statistics. People may be willing to sacrifice economic well-being for residence in an area with beautiful

landscapes and a comfortable climate. Economists suggest that the willingness to trade income for quality of life rises with earnings, suggesting that quality of life is likely to play an increasing role in residential location as countries become wealthier, increasing the likelihood of anomalies.

Figure 6 presents an example of an anomaly, using the proportion of land in forest as a simple measure of landscape appeal. Counties with at least 10% forest had much greater employment growth than those without forest from 1990 to 2000. Yet, unemployment rates in 2000 were considerably higher in the more forested counties. Further, even with this higher unemployment, the forested counties gained population in the 2000-2004 period, while those with little or no forest lost population. There are other possible explanations for this pattern. For instance, areas with little forest tend to have more agriculture and in these areas economic hardship may result less in unemployment than in underemployment. Whatever the explanation, the unemployment rate – a key socioeconomic indicator – is of questionable value in many rural contexts.

Amenities, whether natural or man-made, may be reflected in both lower wages (as individuals willingly forgo income for amenities) and higher housing costs (as individuals willingly pay a premium to reside in a high-amenity area). Thus, although household incomes are much the same in low-forest counties as in higher-forest counties, the median value of housing is over 35% higher in the latter counties.

FOCUS FIGURE I.5
Land in forest and rural county employment indicators



The importance of natural amenities in explaining differences in rural development across rural areas is undoubtedly greater in the US and other countries with wide variations in rural climate and topography than in countries where rural landscapes are more uniform. However, as incomes rise and the importance of national borders

diminishes, the future of rural livelihood and well-being may, for certain rural communities, depend increasingly on the scenic appeal of rural landscapes. This will be particularly important for rural areas that are close to urban centres.

The focus here has been on natural landscapes and climate. In many areas, there is a heritage factor as well. For instance, in the China-US comparative study mentioned above, the greatest agreement between the Chinese urban design students and the rural respondents was in the high appeal of a scene evoking traditional rural culture.

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Focus on Common Problems of Rural Areas in OECD Countries

It is obvious that the problems rural areas face in the OECD Member countries are as diverse as the rural areas themselves. However, there are certain commonalities arising from the intrinsic characteristics of rural areas that should be addressed at any level, be it national or international. These commonalities can be used to guide what statistics are needed.

The traditional **economic base** of rural areas was the primary sector, especially agriculture. Thanks to great progress in farming systems and mechanisation only a small percentage of the workforce of most OECD countries is now occupied in this sector. In almost all rural areas, businesses in the secondary and/or tertiary sector can be found. Often they are related directly or indirectly to the agricultural activities in the area (for example, agricultural machinery repair and maintenance, supply of farming inputs such as seeds or fertilisers and establishments processing agricultural products from the area), but increasingly they are not. In countries such as the UK the profile of occupations of residents of rural areas is very similar to that of urban ones, with only the relatively higher prominence of agriculture (though still of minor importance in terms of total employment and income) to mark out the difference (Hill *et al*. 2005).

Further diversification of the economic base would mean encouraging the development of businesses less dependent on local agricultural activities, or not related at all. Small enterprises seem to be an option for achieving this independence, even when taking into account that economies of scale are difficult to build up. Extending the economic base requires a workforce equipped with suitable **human capital** (skills, education etc.), for which farming may not be a suitable preparation.

Rural areas have historically provided the work force needed to build urban environments and to operate urban factories. This **migration** of (mainly) young people out of rural areas has continued in the recent past, encouraged by policies concentrating on investment and employment at a limited number of urban centres. **Depopulation** of rural areas has been further accentuated by efficiency improvements in farming in combination with the lack of alternative off-farm employment in some rural areas. On the other hand, **repopulation** of rural areas is also observed over the last decades. Decentralisation of certain types of economic activities towards the periphery, the attractiveness of the countryside coupled with better transport facilities (private car ownership, public transport infrastructure etc.) for commuting to urban centres as well as retirement migration are reasons contributing to the repopulation of certain rural areas. However, the combination of these developments may mean that a **structural imbalance** develops in the demographic profile, with a predominance of elderly people and a relative deficit of younger ones. A "viable" age structure is a precondition for developing an area; the area could lose population simply because the birth rate cannot match the death rate (natural population loss). There may be implications for the need for, and provision of, health, education and other services and the amount of human and social capital available to the local community.

Characteristics often associated with rural areas are **high poverty rates** and **social exclusion**. These depend on a number of factors (financial poverty, social transfers, life expectancy, long-term unemployment etc.). Accessibility can be assessed as an absolute and as a relative concept. Here accessibility is interpreted in broad terms. It may refer

to the transportation infrastructure allowing residents to commute, people to visit rural areas for recreation and businesses to have easy access. It refers also to the accessibility of services (both those often provided by governments, such as education and health care, and by private enterprise, such as shopping and leisure services) and social infrastructure associated with a modern society. The relative sparseness of population and remoteness can pose difficulties to the delivery of services as well as a constraint on businesses sited in rural areas. The implication is that statistics may be needed on a wide range of economic and socio-economic variables than go far beyond production, resource use and incomes and reflect other aspect of well-being. Housing conditions, internet broadband coverage and crime are examples.

Despite important economic and demographic challenges, **rural areas are not necessarily synonymous with economic decline.** Indeed, on many indicators rural areas may score well (for example, in the UK – see Hill *et al.* 2005). A wide range of economic performances can be observed (see Focus Box 1.1). There are rural areas with remarkable economic success, for which the OECD (2001) gives the following reasons:

- Urban manufacturing and service industries started to relocate to suburban and rural green-field sites.
- Sustained endogenous development has also been observed, including dynamic SME clusters and industrial districts, development of diversified agro-industries, and rural tourism.
- Residential location decisions place increasing emphasis on quality of life factors, including proximity to open countryside and natural amenities.
- Increased demand on the part of urban dwellers for amenities in rural areas.

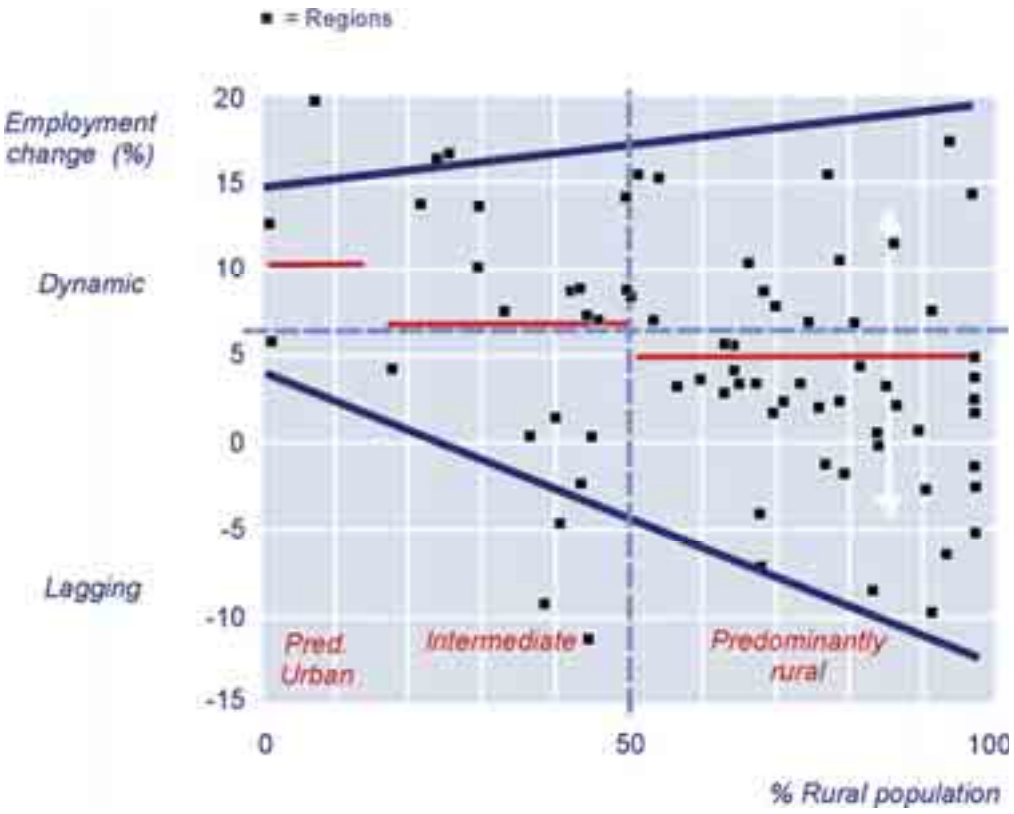
It is worth noting that the declining employment opportunities provided by primary industries (largely agriculture) in OECD countries is also seen in many of the upper-middle-income developing countries (e.g. the so-called NICs and the OPEC members) (OECD, 2001)[1].

[1]*Organization of the Petroleum Exporting Countries (OPEC)*; The NICs is a group of fast developing countries known as "Newly Industrialised Countries".
The World Bank classification is:
1) high-income economies – per capita GNP $9,656 or more
2) upper-middle income economies – per capita GNP $3,126 - $9,655
3) lower-middle income economies – per capita GNP $786 - $3,125
4) low-income economies – per capita GNP $785 or less.

FOCUS BOX I.1
Classification of rural areas in the Danish Rural Development Programme 2007-2013

The OECD (1994) has found that urban areas generally showed higher employment growth than intermediate regions, which in turn had higher average growth than predominantly rural areas. There are, however, predominately rural regions that grew faster, and urban regions that grew slower, than the national average. Having said this, it should be noted that the spread in growth was much higher in predominantly rural regions than in the other two types of regions.

Illustration of the spread in the performance of employment change for different types of regions



Source: *Creating Rural Indicators for Shaping Territorial Policy*. OECD (1994)

An implication of the change seen in the economic structure of rural areas and convergence with that of urban areas is that policies that attempt to encourage economic growth have to look beyond the agricultural sector. According to the OECD (2003, 2006) policy makers increasingly recognise that traditional sectoral policies need to be upgraded and, in some cases, phased out and substituted with more appropriate instruments. Particular concerns are raised by the modest positive impact that agricultural subsidies have on general economic performance even in the most farming-dependent communities. Indeed, with farm families relying increasingly on off-farm employment, the economic success of rural communities will depend on the development of new economic engines.

In this context, OECD governments are showing increasing interest in a more place-based approach to rural policy that emphasises investments rather than subsidies and that is able to integrate different sectoral policies and improve the coherence and effectiveness of public expenditure in rural areas. OECD countries now also widely recognise that rural development is multifaceted. Economic aspects have to sit alongside social and environmental, and policies aimed at one carry implications for the others. This means that statistics will be required for rural (and other) areas that service policies that attempt to tackle a formidable range of issues. Later sections of this Handbook describe the choice of indicators made by national statistical offices and international organisations (see Chapter VI).

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Focus on Common Problems in Rural Areas of Developing Countries

Even though many developing economies are becoming more and more urbanized, according to the World Bank's World Development Indicators (World Bank, 2010) the rural population in low and middle income countries comprised 55% of the total population in 2008, compared with an estimate of 64% for 1990. On average the rural share of the population decreases with the level of economic development. For countries classified by the World bank as low income (that is, those countries with a gross national income per capita of less than US$975 in 2008, the rural population was 71%, for low middle income countries 59% and for upper middle income countries 25%. Despite ongoing structural transformations in many of these economies, poverty is still predominantly a rural phenomenon. Recent analysis of poverty estimates in developing countries (Ravallion, Chen and Sangraula, 2007) suggests that despite the recent pace of urbanization, the majority of the world's poor will still live in rural areas for many decades to come. For the latest available year (2002), it was estimated that the percentage of the population classified as poor, using the MDG global poverty line, was 30% for the rural population and 13% for urban dwellers. and that around 74% of the world's poor live in and gain their livelihoods from rural areas. In developing countries agriculture is a source of livelihoods for an estimated 86 % of rural people (World Bank, 2008). In low income countries it accounts for about 25% of GDP in 2008, compared with 35% in 1995.

In terms of employment, in most developing economies for which employment data are available by sector, agriculture is still the main employer.[1] This is especially the case in Sub-Saharan Africa, where on average more than six out of ten people work in this sector. The share is also high in Asia where between three to four out of ten people work in agriculture. In contrast, in the Middle East and North Africa the figure is less than two out of ten and in Latin America and the Caribbean only between one and two out of ten people. In the Middle East and North Africa, this is mainly the result of the low share of agricultural employment in the oil-producing economies. In Latin America and the Caribbean, the figure masks a wide range of differently structured economies, but for many economies in the region agriculture still plays an important role in terms of employment (ILO, 2009).

The **diversity in development experiences** seen for OECD countries can also be found amongst the developing countries. The 2008 World Development Report classifies developing economies into three categories: (i) **agriculture-based countries**, where agriculture is a major source of growth, accounting for 32 percent of GDP growth on average, mainly because agriculture has a large share of GDP and most of the poor live in rural areas (70 percent); **transforming countries,** where agriculture is no longer a major source of economic growth, contributing on average only 7 percent to GDP growth, but where poverty remains overwhelmingly rural (82 percent of all poor); and **urbanized countries**, where agriculture contributes even less to economic growth, 5 percent on average, and where poverty is mostly urban. Even so, in this last group rural

[1]There is a correlation between the availability of data and GDP per capita; the poorer an economy is, the less likely it is to report data. Given this fact, it is also likely that the share of agriculture-dominated economies would be much higher if data were available for all developing economies.

areas still have 45 percent of the poor, and agribusiness and the food industry and services account for as much as one third of GDP (World Bank, 2008).

FOCUS PIECES

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PART I
RURAL DEVELOPMENT STATISTICS

CHAPTER II

NATIONAL AND INTERNATIONAL RURAL DEVELOPMENT POLICIES

II.1 OBJECTIVES OF NATIONAL RURAL DEVELOPMENT POLICIES

A system of rural development statistics and its associated indicators must closely map the objectives indicated in the policies formulated by governments. Where policies are not very clearly formulated, statisticians have to anticipate indicators being demanded. Statistics also have a role to play in providing information about the process by which development takes place, such as interactions between agents that constitute part of social capital, that is important to know if policies are to be effectively designed. In developing and compiling indicators, statisticians should follow international good practice, as illustrated in this Handbook.

To this end a number of national policy formulations can illustrate levels of concreteness in the policies. Among OECD countries examples from England (United Kingdom), Sweden and Ireland (all EU Member States), USA, Japan, Australia and Canada show a mix of economic, environmental and social objectives.

Focus on OECD Countries: National Rural Development Policies

Aims, and therefore statistics, are context-sensitive. While in EU countries national aims for rural areas may be broad, the official objectives of what is labelled as "EU rural development policy" reflect inter alia the Rural Development Regulations that legitimise the use of EU funds in support of national actions. These exclude reference to, for example, housing, education and social inclusion because these are not fundable from the rural development part of the Common Agricultural Policy (its Pillar II). Thus

statistics needed to service EU "rural development policy" are far narrower than would be required to inform national policies towards rural areas. Similarly, in the United States of America (US) rural development is less than comprehensive, but in a different way. There it appears to be thought of in terms of embracing only economic aims (jobs and incomes), with the environment, for example, being seen as the responsibility of environmental policy[1].

In developing countries, policy objectives vary, but typically combine economic objectives of promoting increases in productivity and output with social goals such as reducing food insecurity, and rural poverty. In recent years, policy goals have also widened to include environmental objectives such as reducing land degradation and deforestation as well as maintain soil fertility. In general, as the level of income increases, the proportion of the population dependent on agriculture decreases and the policy focus moves from social to economic outcomes. Even in large and rapidly developing countries such as Brazil and China, however, the continued existence of large number of rural poor means that the policy focus and hence the need for relevant statistics is likely to include an emphasis on food security and well-being for some time to come.

For low income countries, the focus of rural policy is primarily the reduction of poverty. An internal **World Bank review** of the first round of 12 Poverty Reduction Strategy Papers (PRSPs), covering both Africa and Latin America, indicated major gaps in understanding rural poverty, in particular the linkage between defined actions and outcomes for specific groups of the rural poor and effective mechanisms for selecting and sequencing public sector choice to achieve desired outcomes[2]. The review concluded that much more work is needed to underpin the PRSP process itself in the up-coming PRSP rounds and with implementation to secure, over time, the desired outcomes. This requires greater consensus building between development agencies and state governments on core principles. While much has been done in taking forward strategic thinking within agencies, the dialogue between agencies and state governments must be strengthened for deepening the analytical underpinning and for shared learning on generic issues[3].

Focus on Developing Countries: National Rural Development Policies

[1]See the Special Issue of EuroChoices (2008, volume 7 number 1) comparing EU and US Rural Development Policies (Blandford and Hill, 2008).

[2]The review used as its framework the treatment of rural content issues under the headings of participatory processes; poverty diagnosis; the targets and indicators; and priority public actions – these being the framework set by the World Bank and Fund Joint Staff Assessment (JSA) guidelines. It included an assessment of the PRSP documents and the related JSA documents but did not review related and underpinning working papers and reports. Annex 1 in Proctor (2002) provides further specific detail.

[3]http://europa.eu.int/comm/development/body/theme/rurpol/forum/papers/ProctorEn.pdf

II.2 RURAL DEVELOPMENT – A SECTORAL BASED (AGRICULTURE) APPROACH

II.2.1 THE AGRICULTURAL PERSPECTIVE

Historically, agricultural policy has often been perceived as synonymous with rural policy. Development economists have seen the main role of agriculture as the supply of labour for the industrialized sectors (Lewis, 1954) and, indeed, it is a necessary precondition for the development process. But by emphasizing this as the only important contribution, other significant functions of the agricultural sector tended to be overlooked.

Although farming is still important in shaping land use, employment opportunities in agriculture are declining in relative and absolute terms, at least in the OECD countries (OECD, 2003). Agricultural policy thus provides less and less opportunity to stimulate the viability of the rural economy. Rural employment patterns and perspectives cannot therefore be properly understood by focusing analytical attention exclusively on agricultural sector employment. But it is important, whether for a developed OECD country or a developing country, to monitor the share of agriculture in regional employment and to compare the national average with predominately rural, significantly rural and predominately urban areas, both in absolute terms and in annual changes (OECD, 1994).

Data should also be recorded on territorial differences in part-time and **pluriactive farming**, including agriculture/forestry and agriculture/fishery activities. A large proportion of farm labour is employed part-time and sometimes engaged in other gainful activities. These include the following:

- Processing of agricultural products, for example, cheese making;
- non-agricultural activities on the farm, for example, agro-tourism on the farm;
- employment on other farms;
- off-farm activities (OECD, 1994).

II.2.2 TRENDS IN AGRICULTURE IN THE LAST 50 YEARS – EMPLOYMENT AND PRODUCTIVITY

Looking at the period from end of World War II until now, agriculture in OECD and many other countries has gone through structural change on a scale that hardly any other sector can match. It can be characterized by the following keywords:

- **rapidly falling employment** (including self-employed)[4]; and
- **high productivity increases**; whilst at the same time the
- **cultivated farmland area has been more or less stable**.

[4]This is of course not unique for agriculture. Manufacturing has followed the same path but with a lag. See Chapter V "Industrialization, trade and structural change" in UNCTAD's Trade and Development Report 2003. Capital Accumulation, Growth and Structural Change.

In Canada, for instance, about 1.2 million people worked on a farm as a main-job in 1946. By 1976, however, this number had dropped to a little under a half a million and to 367,400 in 2000 (Trant, 2002). One of the more interesting features is that employment in agriculture declined the most among self-employed farmers with no employees, a group more likely to have smaller farms that can probably more easily be run as a second job. The 1996 Canadian Census of Agriculture reported that 46% of all farmers worked off-farm at some point in the previous year. The comparable figure in 1941 was 36%. Farmers were initially to be found in the forest, fishing, mining and petroleum industries but they are now participating in all sectors. Falling farm employment, however, has not resulted in the large-scale abandonment of farmland.

Improvements in **agricultural labour productivity** have been quite remarkable in many OECD countries. Again taking Canada as an example, agricultural labour productivity increased more than 5-fold between 1961 and 2000, largely out-performing the 3-fold productivity gains in the goods-producing sector and surpassing the gains in the service sector, which had somewhat less than a 2-fold increase.

Another way to view productivity is to measure labour costs per unit produced. Again agriculture clearly appears to have led industrial sectors in terms of productivity gains[5]. In 1961, agriculture was labour intensive in comparison to the goods producing and service sectors of the Canadian economy, sectors which at that time required half the labour of agriculture, to produce a unit of value added production. By the year 2000 that relationship had changed. Labour costs had increased for all sectors as had production. Agriculture was the only sector however where production increased while employment declined. The result was only a 2-fold increase in labour costs per unit of real GDP produced in agriculture in comparison to a 4-fold increase in the goods producing sector and close to a 6-fold increase in the service sector (Trant, 2002).

Productivity is increasingly measured in terms of Total Factor Productivity (TFP), the aggregate calculation of which needs reliable statistics on each of the inputs used by farming and on the value of output generated. The important link between productivity and international competitiveness means that individual OECD countries have strong interests in how their productivity performances compare with those of their rivals. There is particular concern with productivity changes in the EU in relation to the US; both have seen steady growth but with disparities particularly over the short and medium terms (Leetma *et al*, 2004).

II.2.3 TRENDS IN AGRICULTURE IN THE LAST 30 YEARS IN DEVELOPING COUNTRIES – PRODUCTIVITY

Global agriculture's performance over the last quarter-century or so has been impressive. From 1980 to 2004 the gross domestic product (GDP) of agriculture

[5]The 3rd edition of the ILO's Key Indicator of Labour Market (KILM) provides estimates of productivity in agriculture, forestry and fisheries (table 18e). Labour productivity is defined as output - measured by gross domestic product (GDP) – per unit of labour input. For a substantial number of economies, the productivity measures for the total economy and manufacturing are complemented with measures of unit labour cost, i.e. labour cost per unit of output. The estimates of the agriculture, forestry and fisheries sector are of an experimental nature.

expanded globally by an average of 2.0 percent a year, more than the population growth of 1.6 percent a year. Developing countries have led the global agriculture success, by achieving much faster agricultural growth (2.6 percent a year) than industrial countries (0.9 percent a year) in 1980–2004. Indeed, non-OECD countries accounted for an impressive 79 percent of overall agricultural growth during this period. Their share of world agricultural GDP rose from 56 percent in 1980 to 65 percent in 2004.

Yet, improved agricultural performance has not been uniform throughout the developing world. Such improvements have yet to stimulate enough growth in agriculture-based countries, especially in Sub-Saharan Africa, to allow them to achieve a sustained structural transformation. Conversely, the transforming economies in Asia accounted for two-thirds of the developing world's agricultural growth.

Those different performances reflect differences in the underlying conditions of agricultural production systems—their agroclimatic potential, their population density and their infrastructure. For instance, the major contributor to growth in Asia and the developing world in general was productivity gains rather than the expansion of land devoted to agriculture. By contrast, Sub-Saharan Africa agriculture is generally characterised by the poor yields of food staples, even in the most recent period. There are many reasons for this: diverse food crops, poor infrastructure, policy discrimination against agriculture, low investment, and strong dependence on rainfed agriculture

Although crop improvements have extended well beyond the irrigated areas to embrace huge areas of rainfed agriculture in Asia or in the Pacific, Sub-Saharan Africa has not yet participated in this agricultural success. For millennia Asian agriculture has been intensified through irrigation, which continued to expand through the 1990s and into the 2000s. Today 39 percent of the crop area in South Asia is irrigated, 29 percent in East Asia and the Pacific, but only 4 percent in Sub-Saharan Africa.

In addition, decompositions of productivity gains consistently point to livestock expansion; investment in research and development (R&D); and policy and institutional changes as major sources of productivity growth. Good performances also relate to access to markets and services. Rural areas by definition are spatially dispersed, which affects the costs of transport, the quality of public services, and the reliance on subsistence production. The combination of agroclimatic potential and market access provides a working definition of areas that are favoured or less favoured for agriculture, at least for market-oriented production. Less-favoured areas are of two types-constrained by poor market access, and limited by rainfall. Two-thirds of the Sub-Saharan rural population are in less-favoured areas with either or both low agricultural potential or poor market access, compared with only 25 percent for South Asia. Of course, many additional elements of less-favoured areas should also be considered, including the fragility of the natural resource base and social conditions (WDR 2008, Chapter 2).

Focus on Agricultural Productivity in Developing Countries

II.2.4 THE CURRENT SITUATION FOR AGRICULTURE

In OECD countries the agricultural sector continues to shed employment, in part the result of long term pressures (mainly arising from technological advance and static demand) and in part arising from shocks that include rounds of policy reform. In some situations non-farm jobs are not being created fast enough to absorb the individuals concerned and, in consequence, rural communities often have a rate of unemployment above the national average.

Developing countries are in general, characterised by an agricultural sector that is much more important in economic terms, and perhaps also in social terms, to rural areas and to the economy and society overall (OECD, 2003), though it is in relative decline. For example, while in 1995 the percentage of the total economically active population found in agriculture was almost 73% in the Least Developed Countries (LDC's) and among the BRIC countries it ranged from 12% in the Russian Federation to 69% in China, ten years later (2005), the percentage had fallen to 68% in LDC's, and it decreased in general in all the BRIC countries. The highest reductions were registered in Brazil and China, regardless of their very different shares of the active population in agriculture (13% and 64% respectively).

TABLE II.1
Rate of total economically active population in Agriculture over total economically active population

COUNTRY	1995	2005
Brazil	19.55%	13.29%
China	69.35%	63.80%
India	61.37%	56.78%
Russian Federation	12.06%	9.18%
Low Income Food Deficit Countries	63.51%	57.72%
Last Developed Countries	72.84%	67.77%

Source: FAOSTAT, 2010

Agriculture is thus a very important source of employment and income, with implications for other sectors of the economy, in these countries. Raising agriculture productivity is important for reducing poverty and promoting food security and nutritional well-being (cf. Chapter 3 in ILO, 2004). Having said this, it is also clear that non-farm activities, which usually grow faster than farm production, will play an increasingly important role in expanding rural employment and income. Rural employment strategies should therefore also be developed in order to spur off-farm employment opportunities (UN, 2003).

Irrespective of a country's level of economic development, common emerging forces currently affect their agricultures. First is the **globalization** of the world economy led by factors including rising incomes in developing countries, reduction in trade barriers, and large countries moving from planned to market driven economies. For a country's farmers and agribusinesses to compete effectively in global markets, a competitive

agricultural system is needed. More than ever, the competitive structure of agriculture is affected by rules of trade, domestic policies, infrastructure development and new technologies (Vogel, 2002).

Second is the concern with the **environmental consequences** of the intensive use of land and water resources and the application of agricultural chemicals. Policy makers are faced with difficult decisions about appropriate actions to ensure that their agriculture system is competitive in the world market, yet is sustainable and in harmony with the environment.

A third force affecting agriculture in many countries is a rising political awareness of the **social implications** of the changing structure of the nation's farms into fewer but larger operations. This is happening to the extent that it is affecting the social structure of rural communities as the displaced farmers move elsewhere. On the other hand, there is a growing population of part-time farmers around urban areas who have employment elsewhere, but desire the agricultural life style. While these producers may contribute little to overall agricultural production, they do account for a considerable amount of land-use. In low income economies, substantial proportions of total production may be produced largely for subsistence rather than for the market. This non-marketed output may play a social role in rural communities that greatly exceeds its nominal significance in national accounts.

The primary issue facing statisticians is that all three forces are operating at the same time. Unfortunately, many countries have reduced the resources devoted to statistics on agriculture, based on its declining share in the national accounts. Examples can be seen at all levels of economic development, and the issue has been a major factor driving the *Global Strategy to Improve Agricultural and Rural Statistics* (World Bank *et al.*, 2011). Reducing resources is an inappropriate response in that it fails to recognise the wider social roles of agriculture and the need for statistics that relate to them. In particular:

- Agriculture is at the centre of issues concerning land use and the environment.
- Agriculture is a major user of a nation's land and water resources whilst at the same time it is requested to provide an adequate, safe, and nutritious supply of food – a basic goal of every country.
- Agriculture is an important part of many countries' trade balances.
- Agricultural production, perhaps more than any other sector, is very volatile as it suffers from the vagaries of weather on top of market and policy driven effects.

In view of this, a well-designed statistics system needs to provide data to guide governmental policy decisions on agriculture as they relate to food security, economic sustainability, trade and other economic issues that stretch beyond the narrow confines of farming. Conversely, as policy makers grapple with food safety, land use and environmental issues, they will want to know more about how their policies affect the economic and social well-being of farms and farm households. They will want to know about the geographic distribution of agriculture and its supporting infrastructure so that policy can be focussed more directly on sub-sectors or geographic regions (Vogel, 2002).

II.2.5 OTHER CHARACTERISTICS OF AGRICULTURE

Multifunctionality and agriculture

The term multifunctionality is used to convey the notion that agriculture can play several roles in our societies in addition to its primary function of producing food and other agricultural commodities. These roles typically include contribution to the vitality of rural communities (through maintenance of family farming, rural employment and cultural heritage), biological diversity, recreation and tourism, soil and water health, bioenergy, landscape, food quality and safety, and animal welfare. (DeVries, 2000)

It implies "*…the existence of multiple commodity and non commodity outputs that are jointly produced by agriculture, and the fact that some of the non commodity outputs exhibit the characteristics of externalities or public goods*" (OECD, 2001).

Multifunctionality also applies to fishing and forestry policies as well as other economic activities but the examples used here will be drawn from agriculture.

The significance for policy lies in the increased demand for certain of the non commodity outputs of agriculture. These include not only the environmental goods alluded to above but also social attributes such as the contribution that agriculture makes to the vibrancy, vitality and cohesion of rural society. Thus a statistical system should be capable of the following (after OECD, 2003):

- *Distinguishing public from private goods*. Private goods mean that farmers' production belongs to them. On the other hand, farmers are seen increasingly as agents producing public goods in the course of their private activity: landscape, environment, culture, and so on.
- *Distinguishing material from immaterial wealth*. The agricultural world produces material wealth along with immaterial wealth as, for example, landscape management of the soil and the subsoil, biodiversity, etc.

The concept of multifunctional agriculture originated in the context of international trade negotiations. It was greeted with extreme scepticism by major food exporting countries, known collectively as the Cairns Group[6], and by the United States, since the term first gained popularity with countries which are under tremendous pressure to reduce subsidies and trade protections for their domestic farmers – in particular within the EU. Developing countries also expressed doubts whether multifunctionality was just a fancy term that provided cover for Europe and others to shut their markets to agricultural imports, and to continue dumping excess production overseas (DeVries, 2000).

These concerns were also due to the fact that multifunctionality is very costly and most of its private costs are due to constraints on specialisation in production (Arfini and Landini, 2009).

[6]The Cairns Group is formed by the following countries: Argentina, Australia, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Fiji, Guatemala, Indonesia, Malaysia, New Zealand, Paraguay, the Philippines, South Africa, Thailand and Uruguay. In 2000, these countries submitted the following statement on multifunctionality: In: http://cairnsgroup.org/Pages/000426_statement.aspx

Nevertheless, some commentators (Arfini and Landini, 2009) stressed the importance of multifunctionality in the context of rural development policies in developing countries, since it is seen as a variable that reinforces the livelihood strategies of the rural households. The varying nature of the agricultural sector is illustrated by the following examples (DeVries, 2000).

Ethiopia

Ethiopia is attempting to preserve traditional plants and seed varieties, as a signatory of the Convention on Biodiversity. Its Seed Industry Policy tries to balance farmers' need for improved varieties with a national effort to preserve agro-biodiversity of domesticated plants and livestock.

Mauritius

Mauritius' economy relies mostly on sugar cane, and is a net food importing developing country (NFIDC). This country gave an interesting variation on the definition of multifunctionality:

> *"The role of agriculture in all countries is not limited to the production of food and fibre. In many cases, it underpins the socio-economic fabric of rural areas and often, that of countries themselves. In a number of developing countries, provides an instrumental link to the development of eco-tourism, production of energy, avoidance of the use of fossil fuels, the provision of social amenities and in fostering research and technology development. Moreover, it has an important role in the protection and preservation of the environment and biodiversity".*

II.2.6 THE FARM POLICY DILEMMA

In many countries, agriculture policies are, or have been, overwhelmingly focused on subsidies to commodity producers. In others, trade issues or food security are the main focuses of agriculture policies. Broader rural development initiatives only receive a fraction of the subsidies[7] (OECD, 2003).

Countries are, however, becoming increasingly aware of the need for further progressive reductions in domestic agricultural support and border protection, and to shift away from policy measures that encourage higher levels of food production and input use towards measures that are less distorting of markets and trade. These include measures to help agriculture to adjust to its new economic and policy environment,

If productivity gains in agriculture tend to reduce the sector's capacity to create jobs, then viable rural communities may be assured more by comprehensive area-targeted programmes than by traditional agricultural production linked payments. In other words, a shift from a sectoral to a territorial policy approach is called for (OECD, 2001), though these must be seen in the context of general macroeconomic policies that are likely to have greater and more enduring impacts on jobs and incomes in rural areas.

[7]In 2001, total support to OECD agriculture was USD 311 billion, representing 1.3% of GDP across the OECD area (OECD, 2003).

II.3 RURAL DEVELOPMENT – A TERRITORIAL BASED APPROACH

II.3.1 EMPLOYMENT – THE DRIVING FORCE OF RURAL DEVELOPMENT

Labour force participation rates are generally lower in rural regions compared to urban regions. Recently, one of the most remarkable world-wide trends has been the rise in the share of labour force that is female. This phenomenon has been driving employment trends, bridging the gender gap in labour force participation. In the 1980s and early 1990s especially, labour force growth was substantially higher for women than for men in every region of the world except Africa (Lin Lean Lim, 2009). Another interesting feature of labour markets is that in many developing countries women are more likely to work in the agricultural sector than men. In fact, women produce between 60 and 80 percent of the food in most developing countries and are responsible for half of the world's food production, yet their essential role as food producers and providers and their critical contribution to household food security is only now becoming recognized (FAO, 2010).

In rural areas there are large variations in employment creation performance. In the OECD area, it has been noted that a group of dynamic predominantly rural regions, representing between 5% and 15% of the total national work force, has experienced employment growth considerably higher than the national economy as a whole. Thus, **rurality in itself is not a handicap for job creation** (OECD, 1994).

In fact, one of the main conclusions drawn from analysing rural development is that rural areas and their economies are very heterogeneous, with large variations from one area to another. In the United States, for instance, most of the economic growth is concentrated in roughly four of every ten rural counties. Counties that are enjoying robust economic growth tend to have one of three characteristics: scenic amenities (such as in the Rocky Mountains), proximity to metropolitan areas (common to the fringe areas of nearly all major metropolitan areas), or are emerging retail and financial hubs (the solitary growth centres scattered throughout the nation).

Some rural regions perform very well, even better than urban ones. A central question is therefore why certain rural regions perform better than others? Transport infrastructures and towns in the region or the vicinity of a major urban centre are often mentioned as important factors. Each region has different combinations and levels of capital endowment (physical, financial, human and social). What counts is the availability of one form of capital or another as much as the ability to properly exploit it. In some cases, intangible aspects (entrepreneurship, cultural identity, participation and partnerships) are the most important in making the difference.

Some regions succeed well in exploiting their natural resources such as wood, oil, minerals or hydro-electricity or to attract major public infrastructure investments. Another successful strategy has been to focus on amenity based development schemes. The success of some rural regions has been due to their ability to valorise public or quasi public goods such as a clean environment, attractive landscapes and cultural heritage (including food).

In addition, out migration of young people caused by lack of employment opportunities and inadequate access to educational and leisure facilities, along with the in migration of retirees in some places, has led to significant ageing of the population. Moreover, most rural regions have difficulty in establishing the necessary critical mass of facilities, producer services and infrastructures to support economic development. Consequently, entrepreneurs face specific obstacles in starting up enterprises in rural regions.

Developing countries are characterized by high demographic pressure[8]. This determinates stagnation in rural labour markets, causing a constant flow of rural-urban migration (Todaro, 2000). This flow tends to exceed urban job creation rates and to surpass greatly the absorption capacity of industry and urban social services. In this way, migration exacerbates the rural-urban structural imbalances under two main perspectives:

1. On the supply side, internal migration disproportionately increases the growth rate of urban job seekers relative to the increase of urban population. Moreover, because of the presence of well educated young people among migrants, there is a risk of depletion of human capital in the countryside;

2. On the demand side, it is generally more difficult and more expensive to create urban rather than rural employment, because of the need for complementary services and inputs for most jobs is greater in the industrial sector.

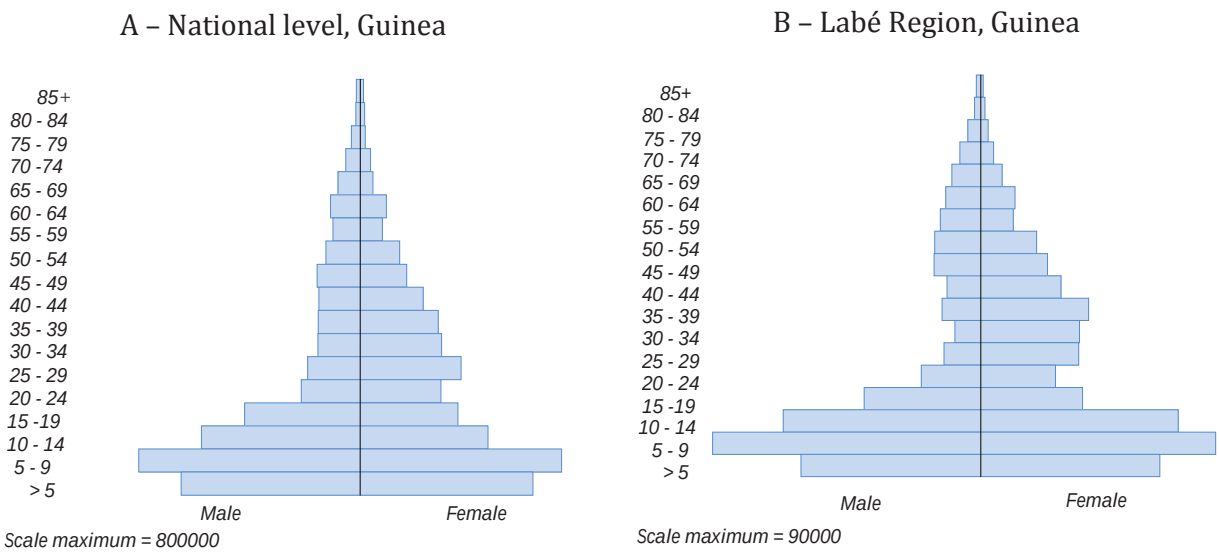
This combination of rapid supply increase and sluggish demand might favour a situation of chronic urban unemployment, in a context of overcrowded megalopolis and depopulating rural areas.

Therefore, improving the balance between rural and urban economic and social opportunities seems to be a necessary condition to contrast urban and rural unemployment problems and rural-urban migration. These goals could be achieved through the integrated development of the rural sector, the spread of rural non-farm activities, and the reorientation of economic activity and social investments toward the rural areas (Todaro, 2000).

The depopulation of rural areas may not be uniform for the male and female population, especially in developing countries, as illustrated by an example from Guinea. Demographic data collected by the country's National Agricultural Census of 2000 shows that the female population exceeded the male population in the 25 to 49 year age group, indicating a so-called "feminization of the agricultural sector". This phenomenon comes out in national level information but can be even more pronounced in selected regions, as shown from data from Guinea's Labé region, where the agricultural population aged 30 to 34 years old consists for 21 percent of men and for 79 percent women. (FAO, 2005).

[8]The OECD recommends that analyses should be made of demographic pressure indices (such as the population between 5 and 14 in relation to the population between 55 and 64) that indicate potential new workers per retiring worker. Another key measure is the dependency ratio, which is defined as the population between 0 and 14 plus over 65 in relation to the active population in the age range of 15-64.

FIGURE II.1
Agricultural population by sex and age group, Guinea, West Africa



Source: National Agricultural Census (RNA), Guinea, 2000

Farming can continue to play a role in, and remains a tool for rural development. It is important to dispel the outdated notion of the "full time farm business" with the household wholly dependent upon agricultural income (see Chapter IX)[9]. Farm households often have multiple income sources (see Chapter X). In other words, the health of the farm and non-farm economies in rural areas is inexorably linked. Dramatic shifts in populations provide another piece of evidence that a new, territorial, approach to rural policy is needed. Many rural places with strong economic gains also experienced strong in-migration, while weak economies often saw an outright loss in population. Labour market statistics also show that unemployment remains highest in the most remote rural places while the suburbs to large cities had the lowest unemployment rates (OECD, 2003). To this end the OECD recommended that more attention should be given to studies which examine intra-regional populations and employment dynamics. These studies should address the following questions:

[9]In this context, Ray Bollman from Statistics Canada has an interesting observation: "Historically, at least in Canada since the period of European settlement, a significant share of farm operators worked off the farm. Also, historically, a relatively small share of the time of farming families was involved in growing plants and husbanding animals. A large share of the time was involved in the manufacturing of horsepower (i.e. raising and maintaining horses) and in the production of fuel (i.e. growing and harvesting hay and oats) and in food processing (washing and sorting eggs, churning butter, separating the cream from the milk, canning fruits and vegetables) – today, work in these manufacturing sectors is classified as 'off-farm work" but this manufacturing activity used to take place on farms. Thus, perhaps, the same share of farm household time is still allocated to tending crops and livestock – the difference today is that the manufacturing of farm inputs and the processing of farm products tends to take place off the farm".

- What role do towns and cities play in rural labour markets and rural development?
- Are there specific patterns of rural, as opposed to urban, employment and population developments?
- What is the economic base of urban and rural structures? Are there significant differences between urban and rural economic bases? (OECD, 1994).

These questions are still at the forefront in many developing countries' policy agendas.

II.3.2 ENTREPRENEURSHIP AND JOB CREATION IN RURAL AREAS

Factors often cited as associated with successful rural areas include well established inter firm relations within clusters, and accessible and valuable natural and cultural resources that increase the sustainable attractiveness of places.

In OECD countries, amenity based development and industrial clustering seem also to offer sustainable prospects for an increasing number of rural areas. Together with increased connectivity due to information technologies, a greater and diversified social demand on rural areas has widened the range of regions considered as having marketable values.

Commuting has always separated where people live and work (Johnson, 1999). Improved transportation allows the distance between work and home to grow. Tele-commuting opportunities allow this distance to grow still more. Furthermore, spatially separated production, using information technology to coordinate production activities, splits the traditional workplace[10]. E-commerce, which is growing rapidly both in volume and in the range of goods and services traded (from stock to groceries), also tends to separate where people live and spend their money.

The development of rural areas is based more and more on interactions with adjacent areas. Cooperation between communities and the setting up of horizontal partnerships between public and private actors over areas sufficiently large to define coherent, common strategies have been seen as the most effective means to enable these new forms of territorial development (OECD, 2003). An example of successful cooperation between public and private actors was the experience of China's Township and Village Enterprises (TVEs). TVEs, owned by the townships or local governments, were created in order to provide incentives to rural industrialization and growth. Due to the remarkable boom in investment and entrepreneurship generated by such enterprises, the TVE's have been considered as the growth engine of the country until the mid-1990s (Qian, 2003a).

[10]See ILO's World Employment Report 2001, which examines the employment challenges and opportunities emerging from the rapid growth of information and communication technologies (ICT) around the world. Recognized as among the major drivers of economic growth and wealth creation, ICT are raising productivity, reducing costs and increasing the speed of communications to help shape the new global economy. The effects of ICT on the emergence of new enterprises and the demand for new skills and knowledge are profound, and this study illustrates how they have changed labour market conditions and industrial relations as well. While analysing how new technologies influence the quantity, quality and location of work, the book also looks at where jobs will be lost and created in industrialized and developing countries.

While agriculture, forestry and fishing formed the traditional economic base of rural areas, the set of externally-oriented economic activities in rural space is now much larger. Manufacturing, tourism, and senior level government facilities of various types are now important sources of external income in many rural areas. Indeed those areas that still depend on farming and the other traditional primary sectors are typically less well off in terms of a broad range of economic indicators.

In the context of developing countries, a territorial approach to rural development is associated with benefits in terms of greater equity and poverty reduction. In particular, the focus on non-farm rural activities could help improve rural livelihoods under many points of view, such as:

- It may reduce farmers' vulnerability to adverse shocks (e.g. crop failures, desertification, price volatility, etc.) by providing alternative sources of income.
- It may provide income-generating opportunities for the landless poor.
- It may give women a chance to improve their well-being in a way that farming may not (either for their limited access to land, credit, farm inputs...; or due to discriminatory intra-household distribution).

II.3.2.1 MANUFACTURING AND INDUSTRY SECTORS

In some rural communities there is no tradition of an indigenous **entrepreneurial class** and little experience in small scale manufacturing. In these places, especially those with limited natural amenities, the potential to diversify beyond agriculture is mainly a function of the ability to attract outside industry.

Nevertheless, **manufacturing** will likely remain a central element in rural development. While many places are trying to expand the role of tourism this is not a real option for rural communities that are too inaccessible or lack a high enough level of amenities to attract visitors. Similarly there is little potential for producer services to play a major role in most rural places. Almost by default, the survival of many rural communities will depend upon maintaining a manufacturing base.

Rural non-farm activities have been neglected in rural development policies for a long time. In the past, the latter focused mainly on agriculture considering rural people uniquely as farmers. For this reason, rural non-farm activities – which include rural manufacturing and services – have only seldom been a policy objective, since they were stereotypically deemed as "not significant, stagnant and lacking in dynamism" (Redzuan and Aref, 2009, pp. 196). Nowadays, this perception has been challenged by policy makers and development practitioners, in particular for the inability of the agricultural sector to absorb the expanding rural labour force and to satisfy the increasing consumption of the rural communities. Therefore, non-farm activities play a key role in rural areas development because industries contribute significantly to the generation of employment and income-earning opportunities. Moreover, studies on peripheral and underdeveloped regions of Malaysia found that the small-scale handicraft industries have distinguishing features and strong links to the local community. Growth and development of rural industries are conditioned by the availability of entrepreneurial skills, access to credit and an adequate infrastructure endowment. These factors

influence the nature of rural firms in terms of dimension, scale of production and technology employed (Redzuan and Aref, 2009).

The dimension of rural enterprises is a variable to be considered. In fact **large firms**, relative to the size of the community, can present significant development problems. Entrepreneurship tends to be reduced if there is one dominant firm in the community. Just as the computer industry merged with the telecommunication industry the same phenomena has happened with agriculture and agri-food. The potential for synergies also exist between agriculture and pharmaceuticals, agri-tourism and agri-environment. As an example, the pharmaceutical industry is introducing processes where pharmaceutical inputs are grown in crops or animals instead of being produced in factories. However, the closing of a single, dominant firm represents considerable risk to the entire community.

It seems to be a universal experience that the establishment size, in terms of persons employed, is smaller in rural than in urbanised regions. The average size of establishments differs considerably and systematically among types of regions and countries, but the smallest establishments are typically found in predominately rural regions. As a result, the average size and structure of enterprises and establishments in relation to employment change should be highlighted (OECD, 1994).

In the context of industrial structure, it should be noted that **specialization** in many rural economies has made them particularly vulnerable to business cycles and resource depletion, for instance in mining and forestry. A mix of businesses with respect to size and industrial and service sector variety seems to better lay the foundation for a more stable labour market (OECD, 1996).

II.3.3 SERVICES

People in rural areas have a right to reasonable access to a range of services to meet their various needs (OECD, 2003). These include not only basic services such as health care, schools, postal services and other communication means, and security (police, fire-brigades etc.) but also retail outlets of private goods and services as well as access to leisure and cultural activities and participation in the political process.

II.3.3.1 EDUCATION AND EMPLOYMENT IN RURAL REGIONS

The level of education of the rural labour force is an important indicator in any assessment of rural employment conditions and trends. Unemployment rates differ significantly according to educational attainment levels. People in rural regions tend to have lower education levels and are more likely to work in industries with low-skill jobs (OECD, 1994).

More than half of the world's population and more than 70 % of the world's poor are to be found in rural areas where hunger, illiteracy and low school achievement are common. Educating a large number of people in rural areas is crucial for achieving sustainable development. Poverty reduction strategies are now placing emphasis on rural development that encompasses all those who live in rural areas. Such strategies need to address the provision of education for the many target groups: children, youth and adults, giving priority to gender imbalances. This complex and urgent challenge

should be addressed systematically, through an intricate set of policy measures, at all levels of education systems.

Rapidly changing technologies and increasing globalization also suggest that better education and training have become essential for sustainable livelihoods and the competitiveness of the rural economy. For many years, the approach followed by policy-makers and education specialists has been to focus on practical and occupational agricultural skill training provided mainly at the secondary and tertiary levels. Yet, in a spatial and economic environment increasingly shaped by non-farming activities, and in a policy context dominated by the poverty reduction agenda, education for rural development requires a holistic approach going beyond the narrow boundaries of the traditional agricultural education and training concept.

II.3.3.2 THE ROLE OF TOURISM

Although there are many methodological problems in measuring tourism, and few hard figures exist to support claims, it is clear that it is a powerful force for change in the economy in both OECD and developing countries (OECD, 1994). Tourism is a growth sector in terms of employment. Overall, it grows faster than total employment, two to ten times faster than for the labour force as a whole, and is often considered an important potential source of employment for many rural areas. When successful, it helps to preserve local jobs in marginal rural areas, creates new jobs where the activity prospers, and diversifies employment.

Tourism-related statistics are hard to identify. There is an international definition but the delimitation is very unclear. In ISIC revision 3, which is the international activity classification, tourism covers:

- ISIC 55: hotels, restaurants and cafes;
- ISIC 60-63: transport and travel;
- ISIC 92: recreational, cultural and sporting activities (market and non-market services).

Of course not all jobs in the above industries can be attributed to tourism.

When analysing the contribution of tourism to rural employment large differences between countries are noted. These, however, are partly due to differences in the content of the statistical categories (OECD, 1994).

Agri-tourism constitutes a significant opportunity where agriculture coincides with scenic or heritage amenities (OECD, 2003). The popular tourist regions in the predominately rural group all have in common a very low population density (OECD, 1994). The interdependence between agriculture and tourism can be illustrated by the example of the **United Kingdom**. The economic consequences of the outbreak of foot and mouth disease in the UK negatively affected farming as well as other rural economic activities. In the UK, income from farming has declined, leaving tourism as the predominant rural economic activity (OECD, 2003). Rural tourism is worth nearly £14 billion a year. It is estimated to support 380,000 jobs in the English countryside, compared to 374,000 in farming in 2000 – including farmers and their spouses. Rural

England is home to some 28% of the population and 35% of registered businesses (OECD, 2003).

A contrasting example comes from **Zambia**. The Zambian Poverty Reduction Strategy Paper (PRSP) (2002-2004) section on tourism sets out a plan that envisages two broad interventions – national and zonal, both of which are expected to encourage investment in the sector. National interventions include rehabilitation of roads in tourist areas, rehabilitation of museums, tourist marketing, and human resource development. Zonal development refers to intense development work in identified tourist areas to make them attractive to tourist investment. It includes building or rehabilitating access roads, tourist roads, and airports where appropriate, and the provision of power (rural electrification).

Significantly, it also includes finding world-class investors who will be the key engine of tourism facilities in the area. Smaller lodges can feed off them. Within this framework, formulae have been designed regarding how the local people can participate in and benefit from the tourism expansion. The first priority zone is the Livingstone and Victoria Falls area because it promises the greatest impact with spillover effects to other parts of Zambia. It is followed by Kafue National Park (physically linked to Livingstone), the Lower Zambezi, and the Lusaka area. Other areas will follow in subsequent PRSPs.

II.3.3.3 THE IMPORTANCE OF COMMUNICATIONS

The lack of access to frequent and reliable transport is a key factor in contributing to disadvantage and social exclusion in rural areas (OECD, 2003). However, scarce public funding must be prioritized. In this context, it could very well be argued that places that are growing "deserve" more public investment in their infrastructure and places that are declining have (almost by definition) too much infrastructure.

The **Zambian** PRSP (2002-2004) is once again a case in point on the issue of prioritization of public resources. The Government of Zambia pledges that the PRSP places a high premium on infrastructure development, particularly rural roads, in order to facilitate faster and diversified agricultural activity. This is well reflected in the scarce resource allocation pattern during the PRSP period. To encourage rural-based agricultural processing and mechanisation, the energy sector is also receiving priority attention.

In any analysis of the employment situation and development trends in rural regions, mobility plays a significant role as a regional balancing mechanism for the labour market. Increased **mobility** in the form of commuting has consequences, not only for the labour market and for social policy, but also in inducing additional traffic and the creation of new challenges for transportation infrastructure policy (OECD, 1994). Commuters are defined as persons who cross regional borders to get from their place of residence to their place of work.

Peripherality has been defined in terms of distance from centres of economic activity. As such it is closely related to, but distinct from rurality, which is defined more often in terms of (low) population density (since rural areas may be very accessible, and some peripheral regions may contain major cities). It is also distinct from the density-based definitions of rurality in being a continuous (as opposed to dichotomous) concept

(Bryden, 2001). (See Chapter III of this Handbook for approaches to defining rural areas)

The simplest measurements of the impact of location on the development of an area are those which consider the transport infrastructure itself, expressed by distance or travel time to nearest nodes of inter-regional transport networks, for example:

- Road length by class;
- Distance from an international airport;
- Distance from a mainline railway station;
- Travel time to nearest urban centre (Bryden, 2001)[11].

There are, however, many more types of measurement of accessibility that have been utilised by researchers and policy practitioners. These include access to networks, distance to the nearest network node, number of direct connections, number of lines arriving at node, travel cost to one other node, average travel cost to all nodes, expected value of utility of visit to all nodes, potential accessibility, number of people reachable with a certain travel cost, inverse of balancing factor in spatial interaction model, and accessibility assessed by expert judgement.

The role of information technology for rural development

Information and Communications Technology (ICT) provides possibilities for rural communities to have access to a whole range of services without being hampered by their distance to providers. It also provides increased opportunity to work from any physical location, which has favoured rural areas with excess labour supply, lower wages and a lower cost-of-living. This is a feature of tele-working from home, but it also refers to the relocation of jobs from industrialized to developing countries, such as "back-office" staff located in call centres, data entry and processing functions and software development. These kinds of services tended to move first to rural areas in developed countries and then to certain developing countries, India in particular.

Work that is independent of location constitutes a growing share of employment in OECD countries. Almost one-fourth of the workforce in the United Kingdom now carries out at least some of its work at home. By 2003, there was an estimated 1.3 million employed in call centres in the EU, up from an estimated 670,000 in 2001. The technology is, however, universal. What constituted a chance for rural communities in OECD countries to have access to a new labour market also represents an opportunity for developing countries.

More than 850 million people in developing countries are excluded from a wide range of information and knowledge, with the rural poor in particular remaining isolated from both traditional media and new information and communication technologies which would improve their livelihoods[12].

[11]There are many arguments from traditional location theory and more recent trade theory (Krugman, 1991) about where new development is likely to take place. Geographic concentration relies on the interaction between increasing returns, transport costs and demand. For an extensive discussion of the accessibility issue see Banister and Berechman (2000:50-54).

[12]Communication for Development. Http://www.rdfs.net/themes/communication_en.htm

Studies on information systems serving rural communities have focused on specific sectors such as agriculture or health, instead of covering rural community needs in a holistic manner. Rural information systems must involve rural communities and local content must be of prime importance (Mchombu, 1993). Traditional media have been used very successfully in developing countries, and rural radio[13] in particular has played a major role in delivering agricultural messages (Munyua, 2000).

Electronic communications are developing rapidly, and any statistics will need frequent updating. Nevertheless it appears that mobile technology is currently the most widely diffused ICT, and by the end of 2008 almost three-quarters of the world's rural inhabitants were covered by a mobile cellular signal, up from 40 percent in 2003[14]. The lowest coverage is in Africa, where just over 50 percent of the rural population is within reach of a mobile cellular network. This still represents a significant improvement from 2003, however, when coverage stood at only 20 percent.

Even if the Internet is rapidly expanding in developing countries, the digital divide remains a major problem in terms of Internet and especially broadband uptake. Data show that at the end of 2008, some 25 percent of households globally had Internet access, though use varies even within the same country. The Canadian case study in Chapter V of this Handbook shows that overall household Internet connectivity and use of computers were lower in rural and small town communities than in their urban counterparts. One possible reason for this is the difference in educational attainment between rural and urban areas.

In the developed world, almost 60 percent of households have Internet, compared to only 12 percent in the developing world. Whereas in OECD countries today virtually all households have access to a broadband connection, levels in the developing countries remain much lower. By the end of 2009, the fixed (wired) broadband penetration rate of developing countries stood at only 3.5 percent, up from around one percent in 2003. While these figures refer to broadband subscriptions rather than users (and one subscription is likely to benefit several users), they are still a good indication of the gap. Moreover, Internet expansion in developing countries is largely an urban phenomenon and most rural communities are not yet able to take advantage of the services available to their urban neighbours. In 2003 and 2005, the United Nations organized the World Summit on the Information Society with the aim of developing strategies to reduce the "digital divide" (Munyua, 2000).

In **Bangladesh** the access to ICT is highly biased toward the urban wealthy population due to its associated high costs, resulting from the capital-intensive infrastructure requirements of ICT. Moreover, excessive monopolization as well as overbearing regulatory controls held back the spread of ICT, while low literacy rates hamper

[13]Using a popular radio programme called "'*Kumuzi Kwath*", (Our Village) and "*Chikaya chitu*" in Chewa and Tumbuka respectively, the Zambia Community Radio Project (ZCRP) (a United States Aid - funded project under the Education Development Centre (EDC) Africa) is reaching out to thousands of villagers, passing on life-saving information on HIV/AIDS and inspiring people to fight poverty through motivational success stories they profile on selected villages (Chanda, 2004).

[14]International Telecommunication Union http://www.itu.int/ITU-D/ict/statistics/ict/index.html

adoption even where ICTs are accessible. Recent statistics on the accessibility of ICTs showed that only 0.8% of the total population owns a personal computer, while the rate of internet users is 0.5%. Finally, the capacity constraints resulting from inadequate investment led to a 8.6% of fixed-line telephone density. By contrast, the mobile phone penetration rate jumped up to 15.8% in 2006 over 6.7% in the preceding year as a result of growth of the country's fledgling mobile phone industry.

Those data highlight a rising concern that, due to asymmetric sharing of information, marginalized people are falling further behind in the competition for jobs, market shares, and common resources. Acknowledging this concern and recognizing that reducing the information gap through sharing can play an important role in improving rural livelihoods, local and national NGOs working with ICTs in collaboration with international NGOs, research organization, government and private sector stakeholders have been developing community information centres known as telecentres to facilitate information transmittal to rural people (ICT for Rural Livelihoods, 2010)

II.3.4 SECTORAL MIX AND TERRITORIAL DYNAMICS

Analysis by the OECD has shown that the economic structure, i.e. the mix of different types of economic activities and size of particular activities, restrains employment growth in predominantly rural regions. At the same time, it is region-specific factors that make a predominantly rural region leading or lagging (Bollman, 2003).

It has been further been shown that 78% of OECD territorial disparity in GDP per capita is due to disparities in labour productivity (GDP per worker). In some countries, such as Denmark, Netherlands, Ireland and Canada, it exceeds 90%. Even among a fairly homogeneous group of countries such as the OECD there is a wide range in territorial disparities of GDP per capita, ranging from an adjusted Gini coefficient of between 0.15-0.20 in Italy, Hungary, United States and Mexico to below 0.05 in Norway, Czech Republic and Sweden (Bollman, 2003).

The large differences in the performance of dynamic and lagging rural regions cannot primarily be explained by differences in their sectorial mix. Other characteristics such as networking and governance as well as a range of additional characteristics, often not yet identified or well understood, are responsible for generating positive territorial development dynamics, which more than offset the disadvantages stemming from unfavourable sectorial structures in rural regions (OECD, 1994)[15].

Taiwan's rapid agricultural and industrial growth and diversification, achieved through a high degree of equality in the distribution of income both within and between the rural and urban sectors, provides a successful example of sector mix in rural policies. After the Second World War, the Taiwanese state invested heavily in employment generating public works, especially irrigation and communication infrastructure; electrification; primary, secondary, and technical education; and agricultural research and extension services.

[15]See the current research activities of Vincenzo Spiezia, Head of the OECD Territorial Indicators and Statistics Unit, which focus on the analysis of regional comparative advantages and the assessment of policies for regional competitiveness (cf. OECD, 2004).

The promotion of labour-intensive rural industry, along with public works, played a crucial role in generating employment, in narrowing the income gap between cities and rural households, and in triggering domestic demand growth. In this way, the massive rural-urban migrations and consequential growth of shantytowns typical of most other developing countries were avoided. Finally, Taiwan's agrarian and rural development strategies were realized in a decentralized fashion largely through Farmers' Associations (FAs) and Irrigation Associations that made them particularly responsive to local needs (North and Cameron, 2000)

II.3.5 OBJECTIVES FOR TERRITORIALLY-BASED RURAL POLICIES

According to the OECD, the focus for promoting rural development and employment in its member countries should be on transforming and developing new and distinctive economic functions (OECD, 2003). The interests of the majority of rural citizens, and even most farm families, seem to be best served by a development strategy based on investments to build local assets. In this context focus should be on:

- Enhancing “competitiveness” of rural regions by targeting local collective goods.
- Shifting from an approach based on subsidizing declining sectors to one based on strategic investments.
- Shifting from a sectoral to a place based approach.
- Enhancing business assistance and networks of knowledge.
- Developing human resources through vocational training, including an important emphasis on entrepreneurial skills, and “capacity building” for policy actors at local levels.
- Ensuring new ways of providing public services in scarcely populated areas (OECD, 2003).

In developing countries, the incidence and depth of poverty are higher in rural areas compared to urban ones. Rural areas also systematically lag behind urban areas in meeting other indicators of wellbeing, such as education, the status of women, child mortality, maternal health, the incidence of endemic diseases, and environmental quality (De Janvry and Sadoulet 2005). Consequently, rural policy objectives in developing and in transition countries should primarily address:

- The role of a sustainable agriculture, which still represents the main source of livelihoods and food security for most of rural people.
- The enhancement of the rural-non farm sector, in order to reduce farmers’ vulnerability and improve their income and employment opportunities.
- The provision of basic social services, necessary condition for a broad-based rural development. Additionally, the creation of social safety nets may represent another important vehicle to tackle poverty.
- The lack of infrastructure and access to information, which are two of the most critical impediments for rural population development and economic growth.
- The promotion of an easier access to credit, productive inputs and technologies, land, extension services, in particular to women and indigenous people.

II.3.6 NEW ISSUES IN RURAL POLICY-MAKING

Past public policies have made simplistic distinctions between rural and urban areas. Furthermore, they have tended to regard rural areas as homogenous, with uniform problems and similar opportunities. In fact every rural place has different assets (OECD, 2001).

Why do regions have such distinct performance profiles? Regions have certain basic resources and characteristics such as geographical location, proximity to markets, topography and climate, natural resource endowments, industrial heritage and endowments of human, social and physical capital that to a large extent shape their development trajectory. Even the new information technologies that make the factor of distance less important do not necessarily lead to more uniform spatial patterns (OECD, 2001).

The need to develop tailor made regional policies has been implicitly recognised by central governments and by, for instance, the EU (for example, the LEADER initiative follows a bottom-up approach).

The development of rural areas is increasingly based on interactions with adjacent areas. The inter-regional aspect is not always taken into account at the international level because these cross border zones do not coincide with traditional administrative divisions.

In practice, a wide variety of institutional arrangements for the delivery of rural policy have been noted in OECD countries, but some common features are:

- Decentralisation towards regions and localities.
- Support for "bottom up" development initiatives.
- Attempts at better co ordination of policies affecting rural areas at central levels through inter departmental and inter ministerial working groups.
- Greater coordination and cooperation at regional and local levels usually through partnerships (OECD, 2001).

It is widely argued that development policy and practice must allow for diversity in the goals and objectives of development, must acknowledge that it should include social, cultural, environmental as well as economic dimensions, and should allow for democratic processes at all levels (OECD, 2001).

II.4 CONCLUSIONS

The main characteristic of rural policies, at least in developing countries, is the shift from a sectoral to a territorial policy approach, including attempts to improve co ordination and to integrate the various sectoral policies at regional and local levels. There is a shift from an approach based on subsidising declining sectors to one based on

strategic investments to develop new activities. More attention is given to quasi public goods and "framework conditions" which support enterprise indirectly. To this end there is an increased focus on local specificities as a means of generating new competitive advantages, such as amenities of an environmental or cultural nature or traditional or labelled local products (OECD, 2001).

Another salient feature of present rural policies is the increased use of partnerships between public, private and voluntary sectors in the development and implementation of local and regional policies. This has also implied decentralisation of policy administration and, within limits, policy design to those levels (OECD, 2001). There are clear moves away from centralised "top down" policy and delivery towards more local "bottom up" approaches within an agreed policy framework, although there are still issues about the balance between these and what institutions and governance are needed in support.

Regional policies play an important role but they need to understand and be sensitive to the differences between urban and rural areas within the region (and between different types of rural area), which may require different approaches. Regions may, in themselves, be at too high a level and sub regional approaches may be needed, as demonstrated by Mexico's focus on micro regions. It is essential to identify, on an individual basis, each particular area's opportunities and advantages as well as its disadvantages.

Agriculture continues to play an important role in rural economies – in many developing countries it is the key sector – and its impact on the landscape, the environment and rural amenities is critical.

Rural areas are not just problems; they also present opportunities and the potential to contribute positively to competitiveness, for example through the growth of micro businesses, niche markets and the increasing role of women entrepreneurs (OECD, 2003). The provision of infrastructure (such as transport, telecommunications, water and sanitation, power and gas, and major water works) and the enhancement of social capital designed to increase the competitiveness of rural areas are more and more the focuses of rural policies. An important part of these policies is the creation of a good environment for entrepreneurship and local initiatives (OECD, 2003). Rural development initiatives do not necessarily need to come from the "capital", although there is a need for the central coordination of a wide range of policies affecting rural citizens through institutional arrangements for inter departmental and inter ministerial coordination (OECD, 2001). Central support needs to provide more flexible arrangements for rural development.

Other conclusions, partly overlapping what was said above, drawn from experiences of rural policies are, in short:

- Efforts to create new institutional arrangements at local and regional levels to define policy objectives priorities and strategies, and implement policies and programmes at these levels.
- A new focus on trying to improve the "competitiveness" of rural areas.

- Attempts to divert resources from programmes which focused on subsidies to maintain existing rural activities to programmes which focus on support for investment in human and social capital, diversification of economic activity and the related creation of new enterprises, key infrastructure, the environment, and innovation.
- Efforts to reinforce rural economies, principally through diversification of economic activities.
- Enhancing business assistance, especially efforts to diffuse new technologies through R&D and the development of specialised regional institutes or centres.
- Developing human resources through vocational training.
- Developing and commercialising natural and cultural "amenities".
- Creation of local products based on local identity and aiming at a market niche.
- New ways of providing public services in rural areas.
- The increasing use of programme evaluation procedures both as a control and a learning mechanism (OECD, 2001).

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FOCUS PIECES – CHAPTER II

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Focus on OECD Countries: National Rural Development Policies

EU Member States and their rural development policy objectives

The main text has established that EU Member States apply rural development policy that forms Pillar II of the Common Agricultural Policy and funded by the European Agricultural Fund for Rural Development (EAFRD). In 2006 the Council agreed that the Rural Development policy from 2007 to 2013 should focus on three areas: improving competitiveness for farming and forestry; environment and countryside; improving quality of life and diversification of the rural economy. A fourth axis based on experience with the Leader programme introduces possibilities for locally based bottom-up approaches to rural development; this is now mainstreamed within the policy rather than the separate initiative it was formerly.

Council Regulation (EC) 1698/2005 sets out the measures that can be funded for the six-year programming period starting in 2007, the procedures for establishing Rural Development Programmes that reflect national and sub-national priorities within those set for the EU as a whole, and how their evaluation has to be carried out. Statistics are important both in establishing the nature of the problems faced by rural areas and to monitoring the changes associated with the impacts of RDPs, though they are unlikely to provide all the information required for evaluation. It should be noted that in RDPs have a strong environmental component that outside the EU would not typically be included within rural development. Common (e.g. EU-wide) evaluation questions are set, and indicators of various sorts are specified (see Chapter IV of this Handbook). However, measures funded in this way are relatively narrow in their focus, often directed within countries mainly at the agricultural and forestry sectors, and exclude many issues of concern to rural residents (such as access to public services, housing etc.). National policies are often found whose objectives are broader. Some examples are given below.

The stated national objectives for rural and countryside policy in **England (United Kingdom)** (the UK's constituent countries have their own rural development policies) are as follows (DEFRA, 2004):

- **Economic and Social Regeneration** – supporting enterprises across rural England, but targeting greater resources at areas of greatest need
- **Social Justice for All** – tackling rural social exclusion wherever it occurs and providing fair access to services and opportunities for all rural people
- **Enhancing the Value of our Countryside** – protecting the natural environment for this and future generations

In **Sweden** the regional policy aims at creating conditions for sustainable economic growth, equity and freedom of choice so that similar living conditions are created for all citizens in the country. To this end the Swedish government has given the National Rural Development Agency the following task: "*… to coordinate different sectors of society and working for good living conditions and development opportunities for rural areas and rural populations…*". One of the ways in which the Agency is managing this task is by providing information about the situation in rural and sparsely populated areas so that it can be monitored and analysed (Jönrup, 2003).

In 1999, **Ireland**'s Department of Agriculture and Food published a White Paper on rural development "Providing for the future: a strategy for rural development in Ireland" (McMahon, 2003). This set out a vision and framework for the development of rural communities in Ireland into the next millennium, concentrating on defining a strategic direction for Government in this area. The White Paper identified a policy agenda with six areas of concern. These are referred to in very general terms in extract shown in Focus Box II.1.

FOCUS BOX II.1
Ireland's "Future Vision and Policy Agenda"

The Government is committed to ensuring the economic and social well-being of rural communities, to providing the conditions for a meaningful and fulfilling life for all people living in rural areas and to striving to achieve a rural Ireland in which:

1. There will be the vibrant sustainable communities with the range of age, income and occupational groups, such as to allow them to adapt to ongoing economic, social, cultural and environmental change and to enjoy a standard of living and a quality of life which will make them attractive communities in which to live and work; the maximum number of rural households, and especially family farms, will be retained; there will be equity in terms of opportunity both between rural and urban communities and between communities in rural areas; individuals and families will have a real choice as to whether to stay in, leave or move to rural Ireland.
2. There will be sufficient income and employment opportunities to allow individuals and families to leave with dignity.
3. Rural communities will enjoy access to education, training and lifelong learning and to an adequate level of social and other services and infrastructures.
4. Rural communities will participate effectively in the structures and decision-making processes affecting them in an inclusive society based on the principles of equity, particularly in relation to gender balance and social justice.
5. The cultural identity of rural communities, in particular the language, traditions, heritage and sense of community will be valued and retained.
6. The rural environment will be respected and development in rural areas will take place in a sustainable manner (McMahon, 2003)

Objectives in other OECD countries

The example of Canada

Historically, the federal government's approach to rural development in **Canada** had a direct effect on rural areas by using sector-specific policies such as agriculture, mining and fishing. Generally, federal intervention in the rural economy had been largely directed towards investment in large-scale infrastructure and industry projects, including agriculture.

An explicit federal rural policy approach is a fairly recent phenomenon, which began in the late 1990s (Matheson, 2006; OECD, 2006b). The new approach of developing rural policy focuses on supporting community capacity to adapt and change, rather than on supporting sectors. It promotes locally-driven economic growth supported by a set of tools to enable rural communities to make decisions about their own future.

Institutions, such as a Rural Secretariat within the Department of Agriculture and Agri-food and the Canadian Rural Partnership, were created to coordinate federal rural activities. This one concerns in the design and delivery of federal policies and programmes, and it encourages federal departments and agencies to scrutinise their policies and programmes through the "Rural Lens" checklist of considerations for determining whether a policy or programme addresses priorities for rural Canada (Government of Canada, 2005). The responsibility for rural development policy follows closely the legislative arrangement of agriculture and can be seen as a shared federal-provincial-territorial responsibility.

The link between agricultural policies and the promotion of rural development objectives is indirectly acknowledged in Canada's agricultural policy framework. For example, the *Agricultural Policy Framework* (APF), which provides the basic legislative framework governing major Canadian agricultural policies, encompasses programmes targeting several policy areas, such as business risk management, food safety, environment, science and innovation, sector renewal. Although, rural development is not part of these policy areas, the APF includes a focus on environmentally responsible agriculture and emphasises the importance of environment as an economic and social good for all rural communities (Matheson, 2006).

The example of Australia

Australia does not have an integrated national rural and regional development policy as such: rather, the focus is on assisting individual regions to determine their own future. Rural development policies are distinct from agricultural, fisheries and forestry policies, and from other regional industry policies (mining and tourism), and support communities through infrastructure development and adequate service provision.

The objective of rural policy is to promote competitive and sustainable rural businesses and industries through the development of integrated policies and programmes in the areas involved. Rural development objectives in Australia are primarily addressed by policies aimed at assisting regions to realise their potential and manage their own future.

On the other hand, the Department of Agriculture, Fisheries and Forestry's (DAFF) role is to develop and implement policies and programmes which ensure that Australia's agricultural, fisheries, food and forestry industries are self-reliant and which improve their productivity, international competitiveness, profitability and sustainability. In particular, the focus on agricultural productivity promotes integrated policies and programmes in the areas of capacity building, skills development, support for rural families in adverse circumstances, research and development (R&D), innovation and biotechnology. Its programmes offer incentives and assistance to help primary producers, fishermen and small rural businesses to identify ways to manage change and adjustment. DAFF also provides policy advice on a range of rural issues – particularly economic, taxation and regulatory issues – and it is responsible for ensuring that rural industry perspectives are taken into account in the development of domestic innovation, science and technology initiatives.

The example of Japan

Rural development in **Japan** has a strong national policy focus. Rural areas face many challenges such as depopulation, an ageing population, land abandonment and rising public concern over environmental issues. The Ministry of Agriculture, Forestry and Fisheries (MAFF) has responsibility for implementing rural development policies.

Nevertheless, the primary focus of rural development is still on agricultural policy. The 1961 *Agricultural Basic Law* – which provided the legal policy framework for agriculture and rural development policies – focused exclusively on the improvement of agricultural productivity in an attempt to bridge the gap between the farming sector incomes and other industrial sectors.

Conversely, even if the 1999 *Basic Law on Food, Agriculture and Rural Areas* keeps the central focus on agricultural policies, it also broadened the scope to include policy issues concerning agriculture, food and rural areas (Saika, 2006; Kitahara, 2003).

The Law emphasises the importance of the sustainable development of agriculture and the development of rural areas in order to fulfil a two-fold goal: i) securing a stable food supply; and ii) realising the multifunctional roles of agriculture.

Moreover, the Rural Development Bureau has been created to coordinate other Ministries and local governments in the common effort of rural development.

The recent 2005 Basic Plan highlights the necessity to establish a wide-ranging policy framework in the attempt to coordinate agricultural and rural development policies. Dealing with agricultural policies, the Plan suggested the introduction of a new direct payment measure in 2007 to accelerate the structural reform of Japanese agriculture. At the same time it proposed a review of the system of agricultural land ownership and land-use (OECD, 2009).

In the field of rural development, the Plan emphasises a shift from simply alleviating the economic disparities between rural and urban areas, towards the promotion of local initiatives. Thus, rural development policies should follow four main directions: 1) the preservation of rural resources; 2) the revitalisation of rural economies through the valorisation of the unique local heritage; 3) the encouragement of partnerships between rural and urban areas; finally 4) the provision of the needed infrastructure to improve rural standards of living. These guidelines are reflected in the rural development programme introduced in 2007 (OECD, 2009).

The example of United States

Since in the **United States** rural development used to be defined as agricultural development, little connection now exists between agricultural and rural development policies. Few public strategies for rural development play a significant role for farming, and the connection between farm support and the promotion of rural development in the legislation is much more unvoiced than in the EU. The US model is based on private organisations and public-private partnerships in the promotion of rural development.

For instance, the 2002 Farm Security Act does not explicitly address the contribution of agricultural policy to rural development goals. Moreover, the enabling legislation does not consider as "rural development" those programmes aimed at promoting sustainable agricultural and forestry practices, agri-environmental and food safety issues, as is the case in the EU.

Conversely, the link between agricultural and rural issues has been explicitly expressed at State and local level (Cochrane *et al.*, 2006).

As designated by the 1980 Rural Development Policy Act, the US Department of Agriculture (USDA) is the principal Federal agency with responsibility for rural development.

The majority of federal rural development programs funds directly local or regional entities. In addition, many federal-state partnerships were created to provide rural development assistance within single- and multi-state regions (e.g. the Appalachian Regional Commission, the Delta Regional Authority and the Denali Commission in Alaska). In this framework, USDA has a leading role in the coordination of rural development efforts among local, State and Federal levels.

Two main goals are in the USDA agenda on rural development. The first is to promote private sector-led growth by using USDA financial resources. The second is to improve the quality of life, by including housing, community utilities and supporting rural infrastructure (USDA, 2006).

Current USDA rural development programmes are grouped under four categories (USDA, 2006):

1. *Economic development:* Aimed at bringing new business and employment to rural areas and new opportunities for income enhancement;
2. *Infrastructure development:* Aimed at countering deficiencies caused by rural poverty or to equalize amenities with metro inhabitants;
3. *Special needs programmes:* Designed to provide individuals and communities without sufficient income access to some level of basic services such as housing, sanitation or health care; and
4. *Natural resource enhancement:* Aimed at improving services provided by the natural environment such as improving water quality and recreational opportunities

Those programmes, most of them targeted to geographical areas, provide financial and technical assistance to rural residents, businesses, and private and public entities for a

variety of purposes, including infrastructure for meeting basic needs such as safe drinking water, electricity and telecommunications, housing, and business enterprises.

Contrasting problems, objectives and approaches in the EU and USA

The US and EU face similar policy issues for many of their rural areas. Problems experienced in rural areas close to major towns are often similar in the two, in the EU and both have regions where remoteness poses a major challenge.. Under such circumstances it is instructive to compare and contrast their policy approaches. Despite apparent differences in the way things are organised, there are many similarities in the types of actions taken. But the paths by which policy has evolved are markedly different, and there are fundamental disparities in attitudes that underlie policy aims.

In any comparative discussion it is necessary to avoid muddying the water by using different concepts of what is rural. Both the criteria used and the size of terrestrial unit can have a large impact on framing the issues. In the EU the rural picture is usually described at quite a large scale and related to population density, whereas in the US the focus is at the county level. Despite this difference, it is possible to make some broad generalisations. In the EU there is typically a tight intermixing of agricultural land use and settlement. Consequently, there is much concern about the way that agriculture reacts with the environment. In the US, by contrast, farming tends to take place away from where the bulk of the population lives. These differences are reflected in the emphasis placed on the role of agriculture in achieving environmental aims and the importance attached to them.

Some of the differences in objectives of policies reflect variations in the causes of rural change, others the way that rural problems are perceived, and some the preferences for alternative approaches (Blandford and Hill, 2008).

- *Differences in social values.* A prerequisite for policy action is the perception of a problem – that something needs changing. Perception reflects the norms and values of society and here there is a real difference between the EU and US. In Europe the prevailing attitude is that rural communities should be preserved. There is an assumption that it is 'bad' for rural settlements to be abandoned, something that goes beyond the mere waste of physical capital or even the diminution of cultural assets. Similarly, there is a feeling that young people should have the opportunity to work and be housed in communities where they were born; again the rationale is not confined to the sustainability of local economies. This contrasts with a more 'sink or swim' attitude to rural communities in US and a far weaker attachment to place (though, of course, there are exceptions). This too reflects history, in which a more mobile society has seen relocation as a natural and acceptable response to changing economic opportunities.
- *Differences in breadth of rural development, especially in terms of the natural environment*. Perhaps the most striking difference is in the bundle of issues labelled as "rural". In the US rural development focuses on increasing economic opportunity and quality of life, for example by improving access to capital, housing and community facilities. Environmental policy is present but is largely separate from rural development policy. In contrast, rural development in the EU

embraces the environmental role of agriculture. Thus agri-environmental schemes feature strongly, accounting for about half of total EU spending on rural development. In contrast, some of the issues addressed under US rural policy are left to more general EU or national policies, housing being a good example.

The inclusion of agri-environmental measures under the European rural development label is largely an accident of history – a by-product of attempts to constrain spending on support for agricultural commodities. In the reformed Common Agricultural Policy under *Agenda 2000*, spending on commodity regimes was designated as Pillar 1, while other forms of EU support were swept up into Pillar 2, also described as rural development. Consequently Pillar 2 contains an array of measures, ranging from the restructuring of agricultural businesses to the promotion of organic farming, in addition to agri-environmental schemes.

- *Structural differences.* Some important drivers of change in rural America do not feature in the EU, or only to a limited extent. In the US higher population growth and less restrictive regulations on land use have led to greater settlement pressure in some rural areas with implications for rural services and quality of life. In some rural counties the influx of immigrants from abroad is the major cause of population increase. New immigrants frequently bring specific problems that have to be addressed. Similarly, illegal cross-border population movements (in the South) raise rural problems. Such factors are not typical of the rural parts of the old EU Member States (EU15) though enlargement may have brought with it flavours of the US situation.
- *Organizational framework.* An important feature of EU rural development policy is that it is organised within a formal framework, established in Community law. At the top of the legal hierarchy are Rural Development Regulations (RDRs), the two most recent spanning the periods 2000-2006 and 2007-13. These are passed by the EU's legislative process and make it possible to use EU funds to support specified national schemes at rates set out in the Regulation. Member States make proposals for national or sub-national Rural Development Programmes (RDPs) given strategic priorities identified by the Commission.

In contrast to the highly directed approach in the EU, US policy operates in a less structured, more organic way. Periodic farm bills are significant through inclusion of a section on rural development. The USDA Rural Development Agency develops and implements a strategic plan; the current one applies to fiscal years 2005-2010. However, Federal schemes are complemented by State and local initiatives,

Despite the apparently looser policy process in the US, commentators such as Cochrane and Wojan (2008) argue that the resulting array of measures looks surprisingly similar to that used in the EU.

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Focus on Developing Countries: National Rural Development Policies

India

According to **India**'s Ministry of Rural Development, India has been a welfare state ever since her Independence and the primary objective of all governmental endeavours has been the welfare of its millions. Planning has been one of the pillars of Indian policy since independence and the country's strength is derived from the achievements of planning. The policies and programmes have been designed to alleviate rural poverty, one of the primary objectives of planned development in India. It was realized that a sustainable strategy of poverty alleviation had to be based on increasing productive employment opportunities through the process of growth. Elimination of poverty, ignorance, disease and inequality of opportunities and providing a better and higher quality of life were the basic premises upon which all the plans and blueprints of development were built.

For India rural development implies both the improved quality of life in rural areas as well as greater social transformation. In order to provide rural people with better prospects for economic development, increased participation of people in the rural development programmes, decentralization of planning, better enforcement of land reforms and greater access to credit are envisaged. In order to ensure that the fruits of economic reform are shared by all sections of society, five elements of social and economic infrastructure, critical to the quality of life in rural areas, were identified (health, education, drinking water, housing and roads)[1].

Zambia

A partnership between the Government of the Republic of **Zambia** and the International Fund for Agricultural Development (IFAD) in implementing projects in Zambia has contributed to bringing about new approaches in the agricultural sector aimed at empowering local communities. This is being done in line with the Poverty Reduction Strategy Paper (PRSP).

According to a first progress report of the Zambian PRSP (from January 2002 to June 2003) (GRZ, 2004), agriculture is a key sector in Zambia's poverty reduction efforts, since most of the poor are in agriculture and also because of the presence of a large resource endowment and conditions suited for agriculture development. The strategy for agriculture is two pronged: (i) ensuring food security and (ii) diversifying agriculture production through promotion of both large-scale and small-scale producers (under out-grower schemes as well as opening up farm blocks). The PRSP also aims at developing water resource infrastructure such as dams, boreholes and wells for improvement in water supply in rural areas and for agricultural use. However, the improvement of water and sanitation in rural areas has been constrained by lack of funding (GRZ, 2004).

[1] http://rural.nic.in/i1.htm

China

The government of China broadened the scope of rural policy with its 2006-2010 plan, "Building a New Socialist Countryside" (NSC). The policy approach targets agricultural productivity, land use, rural income, local governance reforms and public service delivery, in order to solve the "three rural" issues concerning agriculture, rural communities and farmers. The main objectives of agricultural policy have been:

- food security
- farm household income
- food safety
- environmental protection
- agricultural competitiveness (OECD, 2005).

The process of reforming China's policy for rural areas has started in 1978, evolving from planning towards a more market-based approach. This involved a relaxation of agricultural controls and a more decentralised production system, called household production responsibility system (HPRS). The reforms in agriculture in the late 1970s and early 1980s contributed extensively to China's success in raising rural incomes and increase agricultural productivity. The more autonomous rural governance system and the higher diversification of economic activities stemmed from those economic reforms.

Public expenditure for rural areas increased to contrast the rising territorial imbalances between rural and urban areas. Expenditure on rural areas almost doubled in nominal terms between 2004 and 2007, with the largest part being provided through agricultural policy measures (55% of the total in 2007), followed by rural infrastructure (23%) and social development which combines support for rural education, health care, rural poverty alleviation and rural social security (20%) (OECD, 2009).

Brazil

The main goals of the Brazil's 2008 Agriculture Multiannual Plan (PPA) are the promotion of economic development, environmental sustainability, employment generation, a more equitable income distribution and the reduction of regional inequalities. These broad objectives are implemented through programmes targeted either to the modern commercially orientated agro-food sector or to poorer rural households who practice agriculture of subsistence.

The former are aimed at providing price support to producers in order to reduce price volatility, rather than maintain high domestic prices. Conversely, other programmes specifically support small and/or medium-scale producers, who are deemed to be at a disadvantage either because their costs are raised by the lack of infrastructure or because of locally depressed incomes. These actions are part of the broader National Programme for the Strengthening of Family Agriculture (PRONAF). This was introduced to provide long-term benefit to small holders – including subsidised credit, training and extension, and the promotion of rural non-farm activities. With the adoption of the Zero Hunger (Fame Zero) programme in 2003, support for family farming became part of the objective of combating hunger and poverty in Brazil. This goal is also endorsed by the current land reform and infrastructure programmes.

Indeed, weak infrastructure is a significant bottleneck to rural development. Production areas are typically a long distance from their principal market areas and internal logistic systems are relatively underdeveloped. The policy challenge of developing the necessary infrastructure is made more difficult by environmental concerns associated with the potential destruction of natural ecosystems (OECD, 2009b).

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Focus on Agricultural Productivity in Developing Countries

Productivity employment – The example of China

China's agriculture reforms from 1978 led to significant productivity gains, increased diversion of agricultural labour into non-agricultural activities and higher real per capita incomes (Carter, Chen and Chu, 1999). The growth in agricultural labour productivity was important to both augmenting the average labour productivity in rural areas and the labour productivity of farm households. According to national aggregate data, total factor productivity (TFP) in China's agriculture increased by 55 percent from 1979 to 1984. This was unprecedented in the developing world, and most of the rapid change was attributed to the Household Responsibility System (HRS), which was a one-off institutional change. After the effects of the HRS petered out, a policy issue that surfaced in the late 1980s and early 1990s was a slowdown in the growth of investment in agriculture. Yet, without the major out-migration from agriculture towards non-farm jobs, such a broad-based boost in agricultural labour productivity could not be realised.

Productivity growth is particularly important for two main reasons: primarily because nearly 50 percent of the country's total labour force is still employed in the agricultural sector, and second, because agriculture is the main source of income for poor rural households. Poverty rates are closely linked to the performance of this sector. In fact, regions where agriculture growth lagged behind other sectors did not present significant poverty reduction. On the contrary, in case of economic diversification and rapid growth, farm employment and wage rates increased, while rates of rural poverty declined (World Bank, 2000). For these reasons, the Government restarted investing in agriculture from the late 1990s, with a special focus on improving irrigation and other rural infrastructure (OECD, 2005).

Productivity employment – The example of Sub-Saharan Africa

While the expansion of food production in Asia has been achieved through increases in productivity, in **Sub-Saharan Africa** it mainly depended on the extensification of the area cultivated. This trend was due to some Sub-Saharan Africa's specific features:

- *Population density and land availability.* The population density in Sub-Saharan Africa is only one-tenth that in South Asia. Yet, there are many areas of Sub-Saharan Africa where the population density is so high that land expansion under rainfed conditions is no longer sustainable.
- *Infrastructure underdevelopment.* The lack of infrastructure – roads, railways and irrigation systems – constitutes a major constraint to Sub-Saharan Africa development, leading to increases in transaction costs and market risks.
- *Geography and agro-ecology.* Sub-Saharan Africa was not able to take advantage of the green revolution because of its intrinsically different agroecological characteristics. While in Asia the main green revolution cereals were wheat and rice, largely irrigated, in Sub-Saharan Africa there are a large number of staples and many different rainfed farming systems. Therefore, in order to increase agricultural productivity, there would be needed some improved crop varieties by using Africa-specific technologies. However, the trend for R&D spending on agriculture was sluggish in the 1990s.

- *Low fertilizer use.* Because of high prices, the use of fertilizers has stagnated at very low levels. Low volumes, high prices, high transport costs, and undeveloped private input markets are major barriers to fertilizer use, and hence to productivity, in Sub-Saharan Africa.
- *Land degradation.* Soils in Sub-Saharan Africa are rapidly degrading because of shorter fallows and occupation of more fragile lands due to population growth. About the three quarters of the farmland is affected by severe mining of soil nutrients, especially in areas of high population density. For example, the estimated annual productivity loss in the Ethiopian highlands from soil degradation is 2–3 percent of agricultural GDP a year. Therefore a priority should be reversing this trend, since the decline of soil fertility is a large part of the reason for Sub-Saharan Africa's low yields.
- *Distorted policies.* Sub-Saharan Africa agriculture was taxed more than in other regions and the government did not provide adequate credit, support prices, and input subsidies to farmers. Thus, macroeconomic policies and small public investment in agriculture reduced incentives to private agents and limited supply of public goods such as R&D and roads.

Recent evidence suggests that Sub-Saharan Africa may be turning the corner. There are many local successes in food crop production and many promising technological innovations in the early stages of adoption. The challenge is how to achieve productivity gains in diverse rainfed systems by coordinating investments in technology with investments in institutions and infrastructure to promote development of input and output markets.

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CHAPTER III

CONCEPTUAL FRAMEWORK – RURAL AREAS AND THEIR CLASSIFICATION

Chapter III reviews the conceptual framework of what comprises a rural area and the basis of classifying such areas in degrees of rurality. The following chapter (Chapter IV) explores the selection of indicators for such areas, including some of the more theoretical approaches by which a core set may be assembled. Later chapters present examples of national approaches (Chapter V) and those of multi-country bodies (Chapter VI). Here four main issues are tackled – the definition of what constitutes a rural area, the typologies of areas that flow from its use, the requirements of indicators and their assessment, and the themes into which indicators are conventionally grouped.

At the outset it is worth establishing that statistics for rural areas form part of a broader coverage that puts them in context. Rural analysis frequently relies on the ability to describe the differences and the interrelationships between rural areas and other parts of the country. As a consequence it is appropriate to study the entire territory of countries and not just their rural parts. For example, in reviewing the characteristics of rural areas in Latin America (Rodriguez, 2010a) mention is made of the lower population density and smaller size of human settlements *vis-à-vis* urban areas; larger distances to access public services; lower availability and access to basic services and basic infrastructure (e.g. paved roads, pedestrian walkways, electricity, public lighting, piped water, phones, schools, etc.); the presence of ecosystems and natural resources and their legal status (e.g. national parks), the presence of primary activities (e.g. land use); the presence of areas of "urban expansion", the presence of manufacturing and services; the forms of territorial organization; contamination; the existence of employment related to temporal or permanent migrations; household characteristics (e.g. the presence of women as head, household size, low schooling, traditional family values); the higher importance placed on community and cultural values (e.g. a stronger sense of belonging); and public security. Many of these differences in characteristics between rural and urban areas apply to countries at all stages of economic development. Only if data are available for all parts can consistency of results be confirmed (OECD,

1996). The underlying territorial database should be structured neutrally, in such a way that it can also be used for other purposes, such as for urban or regional statistics. The database should, in principle, allow for **alternative groupings** of areas according to multiple analytical needs.

The sub-sections of this chapter give prominence to work carried out by the OECD. This is purely for the purpose of illustration of concepts that are applicable universally. Literature from OECD and its Members is also readily accessible. It should not be taken as an indication of any qualitative or quantitative preference for the OECD material. In order to avoid repetition of common features and issues that have been accounted for in the OECD sub-section, they are not repeated in the successive sections covering situation in countries covered by other international organizations.

III.1 DEFINITIONS OF RURAL

A key issue in the construction of statistics on rural areas is the method by which they are distinguished from non-rural areas – in other words, the definition of what is rural. As will become apparent, this is context-sensitive and may reflect a number of factors.

There is an apparent dichotomy of views as to what sort of definition should be used. The UN Statistical Division argues that *"given the variety of situations in the countries of the world, it is not possible or desirable to adopt uniform criteria to distinguish urban areas from rural areas […]. Clearly, national statistical offices are in the best position to establish the most appropriate criteria to characterize urban areas in the respective countries*" (UN, 2002 p. 106). In contrast, the OECD had originally agreed on a uniform single criterion (population density set at 150 inhabitants per Km^2) for application in its members to separate urban and rural communities. Later, it added another criterion, which is the presence of an urban centre in the region, representing no less than 25% of the regional population.

This variety of approaches is part of a broader debate that encompasses:

1. The purpose for which the classification is required (which may be to reflect lifestyles in social, cultural and environmental terms, the functions performed by rural and urban areas, and public policy). For comparisons over time for the same country a national definition appropriate to the local conditions may suffice, but this may not be satisfactory where the interest is in making international comparisons.
2. The use of multiple and heterogeneous criteria to define rural areas, or a small reduced list, or even a single criterion. The last may be more easily implemented for comparing a multiplicity of countries but may omit some variables that are considered of local importance. In practice, a reduced list may be difficult to agree across national boundaries (Rodriguez, 2010b).
3. Whether a dichotomic (rural/non-rural) or gradient approach should be used. Gradients permit the identification of different types of territories, from the distinctly rural (dispersed rural), going through intermediate categories, up to those that are eminently urban. (e.g. metropolitan areas) (see Box III.1 for ways of constructing gradients).

Variables differ in their ability to be quantified, which may be reflected in their suitability as the basis of forming a workable definition. Furthermore, it is important to distinguish between those variables used to separate between urban and rural (e.g. access to public services) from those that can be used to establish differences in the dynamics of both categories (e.g. differences in schooling).

BOX III.1
Ways of constructing a gradient of rural areas

Once there is agreement on the variables to be considered when defining rural areas, there are at least three possibilities for constructing a gradient. The first is to start with a dichotomic urban-rural classification of smaller and heterogeneous geographical units and then, by means of adequate aggregation procedures establishing the categories of the gradient for larger territorial units. In this case the urban-rural separation is based on a single variable (e.g. population density). An example is the original OECD gradient, which separated communes based on a population density threshold of 150 inhabitants/km^2, and then classified territories in predominantly rural, intermediate and predominantly urban, depending on the proportion of population living in urban and rural communes.

A second option, adequate when more than one variable is used, is to reduce the variables to a common metric (e.g. a 0-1 scale) and use them to construct an index, whose extreme value represent the limiting conditions of rurality or absence of it. Then, using adequate aggregation statistical procedures, the categories of the gradient are established. This approach is applied by Saborío and Rodríguez (2008) for Costa Rica and by Waldorf (2006) for the USA.

An intermediate option is when the gradient is based on only two variables. In this case the gradient is the result of the cross classification of the categories of both variables. The result is a gradient with a minimum of four groups for the case when both variables are classified in dichotomic classes. One example of this type of gradient is provided by Candia (2010) for Brazil, Chile, Ecuador, Panamá and Venezuela and by Rodríguez and Murillo (2008) for Costa Rica. Another example is the current OECD typology, which modifies the classification of a region based on population density if it has an urban centre representing no less than 25% of the regional population.

The third option is to establish first the gradient's categories and, if deemed appropriate, aggregate in two categories, one urban and one rural. This is, for example, the case of Costa Rica, where census enumeration segments are classified in a gradient of four categories: rural concentrated, rural disperse, urban periphery and urban concentrated, which can be aggregated into urban and rural. In such case, however, there is not an official procedure similar to that of the OECD for larger geographical units (e.g. Districts); therefore, the gradient allows the quantification of the population living in each type of segment, but not a characterization of territories according to the degree of rurality-urbanity. Using similar criteria to those of OECD, Rodríguez and Murillo (2008) carried out the exercise to classify Costa Rican districts and cantons in predominantly rural, predominantly urban and intermediate.

III.1.1 CONCEPT OF RURAL AREAS IN OECD COUNTRIES

The potential complexity of applying a definition of what is a rural area is illustrated by the situation in OECD countries. On the one hand the notion of "rural" is universally used by OECD Member countries, as describing certain parts of the country that are characterized by a relatively low number or density of population, or by certain socio-economic features (OECD, 1996). On the other, a survey in 2003 by the UNECE[1] on Rural Development statistics highlighted the great number of definitions of rural then in use (see Chapter V). Thus **no single accepted official definition of "rural" exists** among the richer industrialised countries**.** There are three main reasons for this (EU, 2008):

1. The various perceptions of what is (and what is not) rural and of the elements characterizing "rurality" (natural, economic, cultural, etc.),
2. The inherent need to have a tailor-made definition according to the "object" analysed or policy concerned,
3. The difficulty in collecting relevant data at the level of basic geographical units (administrative unit, grid cell, plot, etc.).

Nevertheless, the OECD definition (OECD 1994, 1996 and 2007a) is the most used at international level in territorial analysis in member countries. It is based on three criteria, combining features of population density, distribution and size. Details, and the typology of areas developed from their use, are described in Section III.2.1 below.

In parallel to the OECD definition, member countries have their own definition(s) of rural. In a number of them, rural is treated as a residual category. In this instance, it is defined negatively, in the sense of not being "urban" or "agglomerated", rather than being explicitly specified by its own properties. Urban definitions vary somewhat amongst countries, but in general urban areas are thought of as agglomerate with a high density of persons per square kilometre.

Even if "rural" is defined as a residual, the two concepts of urban and rural are not perfect complements, especially in highly populated countries. Rural space belongs to that complex blend of elements deemed as "not urban": suburban areas, villages, small towns, industrial areas, natural parks, mountains, lakes, deserts and so on (Gibbs *et al.*, 2008). Moreover, rural (and especially extremely rural) areas often do not overlap administrative areas precisely (Pizzoli, 2010), whereas urban areas usually can be fitted into small administrative boundaries (municipalities or district).

In many cases, administrative and political subdivision of areas is based on geographical characteristics (rivers, mountains, coasts, etc.) and borders are designed based on them. However, in other cases administrative boundaries have been geometrically designed only on maps[2]. In the latter, new technologies based on remote sensing and digital photos allow the identification of rural areas with high degrees of approximation and enable them to be delimited at a small area scale (Smith *et al.*, 2009). At the state of the art, the main limits to using this kind of solution stem from economic constraints and data availability.

[1]For further information on the UNECE project please refer to Chapter IV.

[2]As in some ex-colonial African countries.

Therefore, a fundamental issue when constructing statistics for rural areas is the definition used to distinguish them from other areas. Choice has to be made on a number of aspects that carry implications for the statistics. These are:

A) The size of the territorial units and the level of geographic hierarchy;

B) The criteria used to characterize the units at the respective levels;

C) The quantitative thresholds used to define the boundary between rural and other areas (OECD, 1996).

A) Size of territorial unit

Considering the first of these, it is clear that, among OECD countries, the basic territorial units used in national definitions of rural vary considerably in size, both with regard to population and area. For example, French Communes, which are the smallest administrative units in Europe, have an average population of 1,500 inhabitants and a surface area of 15 square kilometres while English Districts encompass 118,000 inhabitants in areas of more than 500 square kilometres. Counties, which in the United States are used as the basic building blocks for rural analysis, have an average population of 80,000 inhabitants and an average surface area of almost 3,000 square kilometres. In terms of area, these American Counties are much smaller in the East than in the West (OECD, 1996).

Within OECD countries, local and regional administrations perceive rural issues and implement rural policies mostly with reference to the geographic detail at the local community level. In contrast, national, as well as supra-national administrations often deal with rural issues at the more aggregate regional level (OECD, 1996). *A priori*, neither level of territorial detail is more appropriate than the other. The "right" choice will depend on the analytical purpose or on the policy problems that have to be solved.

Two-level approach – an explanation

As a simplification, one can roughly distinguish two levels of territorial hierarchy used in practice for rural classification and analysis.

- Local community level: At this level, the territorial grid is very detailed. It consists of small, though not necessarily the smallest possible, basic administrative or statistical units. Rural analysis is usually based on these local units when it is concerned with characteristics of "homogeneous" areas that can be classified as being either rural or urban. In practice, several levels of local units may be in use simultaneously where the policy interest goes down to small areas, such as where there a pockets of identifiably rural problems in close proximity to built-up areas (see the case study for England).
- Regional level: Here the territorial grid is less detailed. The geographic building blocks are larger administrative units or functional zones, such as provinces or labour market areas. At this level, the emphasis of rural analysis is on functional relations and on the wider context in which rural development takes place. Usually these larger zones cannot be classified in terms of either rural or urban but as more or less rural, according to their degree of rurality.

This distinction between two hierarchical levels of territorial detail is central to the conceptual approach. Without this distinction, it would be impossible to accurately describe the complexity of rural problems in their various national and regional contexts. A too narrowly designed scheme for territorial analysis would not **properly reflect the diversity** of analytical and policy perspectives concerning rural development both within and between countries.

The **appropriate level for territorial analysis** always depends on the question under review. If, for example, territorial differences in employment opportunities are to be assessed from an economic policy perspective, information should be made available at the regional level. In fact, unemployment rates are usually reported at this level rather than at the local community level. The implicit premise is that, within reasonable distances, workers should be prepared to commute between their place of residence and their place of work. This may imply commuting from a rural to an urban area.

It would not be a realistic rural policy objective to provide jobs for rural citizen only in their own, or even in other rural communities. A reasonable aim would be for rural citizens to find jobs within an acceptable commuting distance from where they live. The place of work could well be urban but it should be within the same region or labour market area. The distinction between three types of region, however, allows an analysis of job opportunities under the different regional conditions.

The fact that unemployment rates at the local community level are usually not considered as an appropriate measure for judging economic policy performance does not, of course, mean that such figures would not be of interest in a different policy context. From the perspective of social policy, for example, it might be relevant to know whether there are rural/urban differences in crime and suicide rates and to what extent these rates correlate with unemployment.

A **numerical example** may help to underline the advantages, or even the need for, a two level approach. This relates to a simple but important indicator - population change – in Germany. It may give an idea of the complexity of rural development issues and of the need for different strategies for different rural areas, depending on their specific regional contexts (OECD, 1996). In Germany, the total population grew by 1.7% from 1980 to 1990. When growth is measured for both the total rural and the total urban populations, the picture looks rather bad for rural areas; the growth rate for the urban population was almost double that for the rural population (1.9% as compared with 1.0%). However, when broken down into regions, it was evident that the "predominantly rural" regions had the highest increase (2.2%), above the national average and much greater than that in the "significantly rural" regions (0.6%) and even slightly larger than in the "predominantly urbanised" regions (2.1%) (OECD, 1996).

However, even a two-level approach may be misleading. A closer look at the German example shows that the good performance of the predominantly rural regions was due to a very high growth rate in their urban communities; at 6.0% they had by far the highest increase in population. But also the rural communities in the predominantly rural regions did better (1.5%) than the average rural communities (1.0%) and almost attained the national average growth rate (1.7%). The fastest growing rural communities were those in the predominantly urbanised regions (1.8%), almost

reaching the growth rate of the urban communities in those regions (2.2%). The stagnating rural communities were in fact those in the intermediate, significantly rural regions (0.2%). Within these regions, growth in the urban communities was not much better either (0.8%) (OECD, 1996).

These few results give an idea of the complexity of rural development issues and of the need for different strategies for different rural areas, depending on their specific regional contexts (OECD, 1996).

Stability of units

An additional difficulty arises from the fact that in many countries the territorial grids do not remain constant over longer periods of time. **Boundaries are frequently changed**, often as a consequence of administrative reforms. Also, a given unit may be reclassified due to changes in population, making time series analysis on the basis of aggregated rural data particularly difficult, if not impossible.

B) Criteria for designating areas as rural

In terms of the second issue, the **criteria** for the designation of "rural" areas, a **wide range** is found in use. For example, these may include:

- Size of population (total or agglomerated, absolute or relative);
- Population density (in relation to total or usable area);
- Commuting intensity (towards major cities or labour market centres);
- Share of agriculture (either in employment or in value added).

The choice of criteria used to identify rural areas is not independent of the size or hierarchical level of the territorial units to which they are applied. To define rural at the local community level, most OECD countries use a population size criterion. For larger functional or administrative regions, which in most cases will include at least some urban elements, criteria such as density and distance or others such as economic base are more commonly applied (OECD, 1996).

C) Quantitative thresholds

Even when the same criteria are used, the thresholds set for defining the boundary between rural and other categories vary considerably. For population, the size of the agglomerated units used by OECD Member countries varies between 1,000 (Australia and New Zealand) and 20,000 (Korea); 2,000 is the most common threshold. Where the share of agricultural employment has been used (though this is no longer applied in the OECD), the minimum considered for classifying an area as rural differed between 1.5% (Luxemburg) and about 20% (Greece).

It is clear that the use of **alternative definitions** will not only yield different results with regard to the scope of rural areas but will also **create different pictures of their problems and perspectives.** For example:

- If the share of "rural" population in **France** were to be calculated using the French, Italian, Spanish and Greek definitions, the respective results would be: 27%, 51%, 30% and 27%. None of these definitions or their results, not even the

French one, should be considered incontroversially as the "right" one (OECD, 1996).

- In the **United States**, rural analysis relies on two different traditional definitions. The Census bureau definition distinguishing "rural" from "urban" places, the Office of Management and Budget classification differentiating "metropolitan" (or "metro") from "non-metro" counties. In 2000, both definitions happened to result in roughly similar numbers of residents, 21% and 20% of the total United States population. .
- In **Canada**, there are also two main definitions of rural. The Census defines rural areas as those with a population of less than 1,000 and a density of less than 400 persons per square kilometre, while the Rural and Small Town methodology considers as rural areas under 10,000 people outside the commuting zone of a census metropolitan area and census agglomeration area (OECD, 2009).One-third of these "rural" individuals are living within the commuting zone of "larger urban centres" (specifically, Census Metropolitan Areas with an urban core population of 100,000 or more or a Census Agglomeration with an urban core population of 10,000 to 99,999). Thus, these individuals are "rural" in the sense of living outside a centre of 1,000 or more but, from a labour market perspective, they are living within commuting distance of a larger urban centre. From this perspective they might be classified as "metro".

As these few examples show, there is no single "correct" definition of rural. National definitions are continuously under debate and are in fact adjusted from time to time, reflecting, for example, changes in socio-economic and administrative structures or in mobility and communication (OECD, 1996).

Rural as the residual of urban

The UNECE review of national approaches to what is "rural" has shown that it is often considered as corresponding to the residual of "urban"[3]. Studies on whether the definition of rural could be based on attempts to describe urban reveal the following for countries reviewed:

- Two different approaches to measuring "urban" could be identified: one focusing on Urban Communities, the other dealing with Urban Areas and their Urban Centres.
- Population size was the decisive criterion in both approaches.
- The share of "urban" population reported by the two projects differed considerably.
- The ranking of countries by share of urban population varied according to the sources used.

The limitations of these statistics, at least for the purposes of rural analysis, can be demonstrated by a few examples. According to the OECD Urban Affairs statistics, only 18% of the Dutch population lived in urban areas in the mid-1990s – the Netherlands being the most densely populated Member country in the OECD – whereas the highest share of urban population was attributed to Canada (50%) and Greece (38%). In

[3]This review does not cover all OECD countries, but includes non-OECD European countries.

contrast, according to the Social Indicators statistics, Sweden and Denmark were ranked amongst the most urban OECD Member countries, with urban populations of more than 80%. Italy with 53% and the Netherlands with 66% showed up as being the least urban countries (OECD, 1996).

The definitions used may be considered reasonable for urban analysis. But for rural analysis they seem to be a false starting point. Three main conclusions can be derived from this short review:

- "Rural" cannot be well defined as the residual of "urban"; population size alone is not a sufficient criterion for describing "rural";
- Statistics that are not based on commonly applied definitions tend to produce seriously inconsistent results (OECD, 1996).

Focus on National Definitions of Rural in OECD Countries and Others Surveyed by the UN Economic Commission for Europe (UNECE) 2003

Focus on National Definition of Rural Areas at a Very Detailed Local Level – The Example of England and Wales

III.1.2 RURAL AREAS IN DEVELOPING COUNTRIES

The FAO Statistics Division has started work on reviewing the underlying definitions and statistical frameworks for evaluating and monitoring rural development. Current work is focusing on devising a definition of rurality that provides a better basis on which to create indicators. Current definitions focus on population-related concepts, but these definitions are proving to have little value in developing countries where spatial concepts are more important in evaluating and monitoring progress towards the overall goal of measuring rural welfare. In this context, the FAO is devising a rural definition that uses spatial aspects of rurality on a rural-urban continuum. Indicators which use distance as a dimension will be evaluated in the context of creating a statistical framework for rural development, e.g. distance to markets, employment, health services, education etc.

It is worth noting that some of the issues discussed for OECD countries also apply elsewhere. For example, rural areas in China are defined as a residual to urban areas, which are defined as:

- cities, where county-level government (or higher administrative level) is located, districts directly under municipal government and with population density more than 1500 persons per square kilometre and the extension areas of districts directly under municipal government, and
- small towns and special areas with non-agricultural population (more than 3,000 persons), including industrial and mining areas and development zones (Zhiquan, 2002).

In Thailand, the target area is the administrative unit called Tambon, usually translated as "township" or "subdistrict" in English (the latter is the recommended translation) (http://www.cirdap.org.sg/SpecialIssue.pdf). A Tambon is a local government unit: below district (amphoe) and province (changwat), they form the third administrative

subdivision level. The average size of a tambon is about 6 by 6 km, and the average number of households is around 1000. Tambons are sub-divided into 5 classes according to their annual income. Most of the tambons fall into category V and have an annual income of less than 3 million Baht (ILO, 2004.). As of 2009 there are 7,255 tambon - not including the 169 khwaeng of Bangkok, which are set at the same administrative level - thus every district contains 8-10 tambon. Tambon are further subdivided into 69,307 villages (muban), about 10 per tambon. Tambon within cities or towns have no subdivision into villages, but into communities (chumchon) (http://www.absoluteastronomy.com/topics/Tambon).

III.2 TYPOLOGIES OF AREAS

Criteria for classification

For the purpose of rural analysis, the geographic units must be grouped into different types. In doing so, it is crucial not to confuse two logical steps:

1. Identify the object of observation – rural population and area;
2. Describe their status and development.

Since rural is about people and territory, the OECD selected population density, calculated as inhabitants per square kilometre, as the most relevant and practical criterion for identifying **rural at the level of local communities**. Population density reflects characteristics of settlement, distance and even intensity of communication and land use.

Population density is a concept that is both intuitive to users and simple for providers of rural indicators to calculate. Whatever the specific national or regional contexts may be, rural areas will always have a lower population density than urban areas. Contrary to the population size criterion that is applied in most national definitions, the use of population density as the classification criterion for local community units neutralises some of the distorting effects of the differences in the size of these units. Population density also has the advantage of being policy neutral. It does not refer to any specific perception of rural problems and potentials.

As described above, to distinguish between rural and urban communities, not only must the classification criterion be selected but also a quantitative threshold has to be determined. This threshold will be context-sensitive, and it will vary between countries. For example, under the OECD's working definition for its Members the density threshold was set at 150 inhabitants per square kilometres for Europe, North America, Australia and New Zealand, and 500 inhabitants per square kilometre for Japan. Setting thresholds always involves some arbitrary judgment. The decision to use 150 (in the case of Japan 500) as the dividing line was, however, based on a series of considerations. The analysis of the national distributions of local communities by density class showed that for most countries changing the threshold to 100 or 200 inhabitants per square kilometre would not lead to major changes in the share of the rural population. Only for a few countries would the ranking by share of rural population be different. In the case of **Japan** its population density is exceptionally high, being one of only three OECD countries where average national population density exceeds 300 inhabitants per

square kilometre, its settlement pattern is extremely diverse. While the population tends to be concentrated in certain parts of the country, other parts remain unpopulated. Mountains and islands create many natural barriers that limit accessibility. After intensive explorations, it was decided to use the same criteria and methodologies but to apply a higher density threshold of 500 inhabitants per square kilometre (OECD, 1996).

Under the OECD's working definition, rural areas are homogeneous in one dimension: their density is relatively low. This does not mean, of course, that their problems and perspectives are homogeneous. On the contrary, rural areas in the OECD are heterogeneous in several dimensions and it is an important task to understand this diversity further. The differences cannot, however, be explained only by the characteristics of the rural areas themselves. They often result from the type and intensity of relationship the rural communities have to other places in the wider region of which they are a part (OECD, 1996).

Once rural is neutrally defined, the performance of rural areas can be measured by the use of indicators. With descriptions provided by the indicators, it may be of interest to create problem- or policy related - typologies. This should not be confused, however, with the question of what "rural" is. It would be misleading to embed preconceived outcomes of rural analysis in the very definition of rural.

III.2.1 OECD – AN EXAMPLE OF REGIONAL CLASSIFICATION

The **typology of regions** used by the OECD is an example of a gradient measure, though it starts from a dichotomy based on population density. The OECD territorial scheme distinguishes two levels of geographic detail: **local communities** and **regions.** It is based on three criteria, combining features of population density, distribution and size.

The first criterion identifies rural communities according to **population density**. A local community (small, basic administrative units appropriate to the country concerned) is defined as rural if its population density is below 150 inhabitants per square kilometre (500 inhabitants for Japan to account for the fact that its national population density exceeds 300 inhabitants per square kilometre).

The second criterion classifies regions according to the **percentage of population living in rural communities**. Thus, a region is classified as:

- **Predominantly rural** (PR), if more than 50% of its population lives in rural communities.
- **Intermediate** (IN), if between 15% and 50% of its population lives in rural communities.
- **Predominantly urban** (PU), if less than 15% of its population lives in rural communities.

The third criterion is based on the **size of the urban centres**. Accordingly:

- A region that would be classified as PR on the basis of the general rule is classified as IN if it has an urban centre of more than 200 000 inhabitants (500,000 for Japan) representing no less than 25% of the regional population.

- A region that would be classified as IN on the basis of the general rule is classified as PU if it has an urban centre of more than 500 000 inhabitants (1,000,000 for Japan) representing no less than 25% of the regional population.

As the geographic and population size of a "region" can vary significantly both within and between countries, the OECD has also established a systematic classification of territorial units within each Member country. The classifications, and therefore the regional typology, are based on two Territorial Levels (TL). The higher level (TL2) consists of about 300 macro-regions while the lower level (TL3) is composed of about 1,700 micro-regions (OECD, 2009).

The **criterion** used to create the typology at the regional level is the share of the population of the region living in rural communities. Thus, the typology reflects the **degree of rurality** of the whole region (OECD, 1996). In 1990, about a third of the OECD population lived in rural communities that covered over 90% of the OECD territory. About a quarter lived in predominantly rural regions (OECD, 1994).

Refinements

The geographic scheme shown here can serve as a tool to structure the OECD territory and generate internationally comparable data. No doubt, however, it could and should be refined and improved in the course of future work. The following have already been discussed extensively:

- The interdependence of the size of the geographic units and classification threshold in defining rural;
- The options for alternative or more comprehensive sets of classification criteria;
- The implications of selecting modulated rather than uniform thresholds (OECD, 1996).

The descriptive quality of the results generated by the OECD scheme not only depends on the selection of the classification criteria and thresholds but also on the detail of the territorial grids to which they are applied. With regard to this interdependence, it was concluded that efforts should be concentrated more on establishing equivalent grids than on modulating thresholds (OECD, 1996).

It is evident that the sub-national units and the characteristics of the territorial grids vary among Member countries. In an international context, however, the **equivalence of territorial grids** cannot simply be judged on average data for population and area. The choice of grids should always reflect what is considered a reasonable regional or local community context for rural analysis and policy. Not surprisingly, the perception of what might be the appropriate area for territorial units differs considerably between countries like Australia or Canada at the one extreme and most European countries or Japan at the other.

Topography, history and administrative tradition, language or other cultural distinctions have often created territorial entities which are small in area and population but which are nevertheless appropriate units for description of rural problems and policies. In any case, in selecting the territorial grids, a balance must be found between the aim of reflecting diversity and the risk of ignoring important functional relations.

At the regional level, in addition to the main criterion (**regional share of rural population**), a secondary criterion (**size of the urban centre**) has been used. Regions with a centre of more than 500,000 inhabitants are usually better characterised as predominantly urbanised. With an urban centre of more than 200,000 inhabitants, it becomes reasonable to classify regions at least into the intermediate category of significantly rural regions. The additional criterion of urban centre size shifts the distribution by type of region towards the urbanised end.

At the other extreme, for regions with a very low density – below ten or even five inhabitants per square kilometre – it might be reasonable to create an additional category or a sub-category of the predominantly rural areas. The characteristics and perspectives of these **very low density regions** - mostly located in Australia, Canada, and parts of the United States but also in the northern parts of Scandinavia - will probably be quite distinct from those of the predominantly rural regions in the EU. In addition, these regions are usually also very remote from any urban agglomerations. Since, this fourth type of region would probably only be relevant for a limited number of Member countries, it was decided not to introduce it in the tables of this Handbook. Further details could, however, be of interest in future stages of the Project's work.

The OECD typology of regions has been refined recently to take into account remoteness of rural regions: the extended typology comprises remote rural regions, rural regions close to a city, intermediate and predominantly urban regions. It has been developed jointly by DG Regio of the EU Commission and OECD (OECD, 2010), who suggests including a criterion on the accessibility to urban centres (Ruiz and Dijkstra, 2010). The results show a clear distinction between remote rural regions and rural regions close to a city in terms of declining and ageing population, level of productivity and unemployment. This extended typology, which includes a measure of distance from cities for the population living in a rural area, is applied to North America and Europe. The authors aim to extend it in the future to the other OECD countries and evaluate the feasibility to apply a similar method to non OECD countries.
http://www.oecd.org/document/62/0,3343,en_2649_34413_36878718_1_1_1_1,00.html

Links are provided to two examples of regional typologies – in OECD countries in general and in the EU specifically.

Focus on Typology of Regions in OECD Countries
http://www.oecd.org/dataoecd/35/62/42392595.pdf

Focus on Typology of Regions in the European Union (EU)

Examples of typologies used in France and Denmark are also set out in the following two boxes.

BOX III.2
A French definition and typology of rural areas

The French National Institute for statistics and economics (*Institut national de la statistique et des études économiques*, INSEE) defined in 2000 predominantly rural areas (*espace à dominante rurale*, *EDR*) as the total area occupied by small urban municipalities (*communes)* and by rural municipalities (those with less than 2 000 inhabitants), which do not belong to predominantly urban areas (*espace à dominante urbaine*, *EDU*). There are three categories of predominantly urban areas:

- *Urban centres* are defined as urban units with a minimum of 5 000 jobs in the centre itself or in adjacent units (61% of the population, 72% of employment and 8% of land in 1999).
- *Periurban rings* where urbanization is continuous (without enclaves) and a minimum of 40% of the population works in the main urban center or another municipality of the ring.
- *Multipolar municipalies* are contiguous rural municipalities and urban units outside urban areas, where less than 40% of active residents work in several urban areas, without reaching this percentage for any of them.

Periurban rings and multipolar municipalities are considered as periurban municipalities. They included 21% of total population, 12% of employment and 33% of land in 1999.

Predominantly rural areas, being defined by opposition to predominantly urban areas, are quite heterogeneous. They group rural towns with weak urban influence (at least 20% of their active residents work in urban areas), rural units which form rural centres offering between 2 000 and 5 000 jobs, municipalities under their influence and rural units with less than 2 000 jobs. Using the same principles as for predominantly urban areas, they are classified as:

- *Rural employment centres* comprised of urban units (or rural municipalities) grouping between 1500 and 5000 jobs.
- *Rural employment rings* where a minimum of 40% of the population commutes to a rural centre.
- *Other predominantly rural areas* (53% of land and 12% of population).

Rural employment centres and rings are forming rural employment areas representing close to 6% of the population, 6% of employment and 6% of land.

The National Strategic Plan distinguishes two types of rural areas: predominantly rural areas (58.8% of the national territory) and periurban areas (33.1% of the national territory). Periurban areas are considered in this plan because agriculture and forestry occupy 53.2% of the area and offers associated landscapes. In addition, over 35% or farms are located in periurban areas. French rural areas account for 39% of the population (22.8 million inhabitants).

Besides, INSEE has developed in 2004 a zoning system for the French territory comprising 1 745 "*bassins de vie*", defined as the smallest territorial unit in which the population has access to both health, education, public services and shopping equipments, and employment. Employment has been grouped in three broad categories: residential-related sectors, agri-food-related sectors; other industry-related sectors. Territorial units are then classified according to the main employment sector. This classification can be combined with the rural-urban classification above. For example, categories such as residential, periurban rings can then be identified.

Source: INSEE (2002). *Organisation territorial de l'emploi et des services. INSEE Première*, No. 870, November. Perrier-Cornet (2002), *Repenser les Campagnes*, éditions de l'aube; Aubert and Schmitt (2006), *Mécanismes économiques à l'œuvre dans les espaces ruraux, conceptions du rural et logiques de l'intervention publique*, ENESAD/INRA. INSEE (2004). *Les bassins de vie des bourgs et petites villes: une économie résidentielle et souvent industrielle.* Eric Ambiaud, Michel Blanc and Bertrand Schmitt, *INSEE Première* No. 954, April; *Structuration de l'espace rural: une approche par les bassins de vie* (accès en ligne sur www.insee.fr). http://www.insee.fr/fr/themes/detail.asp?ref_id=bassins_vie&reg_id=99&page=donnees-detaillees/bassins_vie/bassins_vie.htm

BOX III.3
Classification of rural areas in the Danish Rural Development Programme 2007-2013

For use in the Rural Development Programme (RDP), the Ministry of Food, Agriculture and Fisheries in co-operation with the Faculty of Agricultural Sciences, University of Aarhus has developed a classification system showing the "degree of rurality" for each municipality. The intention is to establish an indicator of the need for strengthening development in the rural areas. The classification system is based on the following 14 variables indicating socio-economic, demographic and rural conditions for each municipality:

- Population per square kilometer;
- Population in rural areas and in towns with less than 1 000 inhabitants;
- Part of area in rural zones;
- Number of employees in agriculture;
- Part of the population 17-64 years;
- Part of the population 25-44 years;
- Development in population 1994-2004;
- Development in employment 1994-2004;
- Average distance to motorway;
- Number of jobs in relation to number of employed (dependence on commuting);
- Part of work force with basic school education;
- Part of the workforce with medium or higher education;
- Average distance to areas with large surplus of jobs;
- Taxation base per inhabitant.

In the classification system an index of the "degree of rurality" is calculated for each municipality, and based on the index the municipalities are classified into one of four groups: 1) remote municipalities, 2) rural municipalities, 3) intermediate municipalities and 4) urban municipalities. The calculations are made for the municipalities that have been created by the 2007 structural reform.

Part of the Danish RDP applies country wide and for part of the programme the application is dependent upon the classification of the municipality. In the programme "rural municipalities" covers the municipalities in the groups: 1) remote municipalities, 2) rural municipalities and 3) intermediate municipalities, a total of 63 of the 98 municipalities.

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Focus on National Definitions of Rural in UNECE and OECD Countries

Two sources of information are presented here on the definitions used in OECD countries and those covered by the UN Economic Commission for Europe (UNECE). The first is a survey conducted by the UNECE on a range of issues relating to statistics for rural areas, of which the definitions of rural then in use was only one topic. Fuller results are presented in a section linked to Chapter V where national approaches to rural statistics are reviewed, though it is relevant at this stage to report an analysis of the main characteristics of the definitions of what constitutes a rural area.

The second source is the OECD which, for 30 Member countries, has built up an inventory of the national statistical definitions of rural in use. There is some overlap with the UNECE survey, which is quoted as one of its information sources. However, the coverage of countries is different and there is a greater level of detail for some of them.

A. Summary analysis of responses from countries surveyed by the UN Economic Commission for Europe (UNECE) in 2003

The responses to the 2003 UNECE survey showed that there was a **large variety of national definitions**. In several countries more than one definition was used; the policy issue to be addressed determined which definition was employed. The differences, both within countries and between countries, related not only to the different variables taken to distinguish rural from non-rural but also to different thresholds and basic statistical units.

It should be borne in mind that changes may have been made in national practices since the 2003 UNECE survey was carried out. However, on the basis of the information then gathered there appeared to be two main definition types. One was based on variables applied to **administrative areas** such as municipalities or larger areas (such as, for example, "Kreise" in Germany or counties in the United States). The second type was a **settlement-based definition**, which looked at built-up areas/urban land use irrespective of administrative boundaries. The first type was more commonly found than the second.

Both these basic types of definitions then used specific variables to distinguish rural from non-rural areas. For a detailed summary of the definition of rural the reader is referred to Chapter V of this Handbook and the link given there to the results of the 2003 UNECE Survey.

Most definitions in use were a **combination of two or more variables,** most frequently population level and population density, but also commuting intensity. The **way these variables were used differed greatly**. In Denmark and the Czech Republic, the number of inhabitants of an administrative area was used on its own. In Germany, the definition was based on the population level of urban centres and the population density of the area surrounding urban centres. In the United States, one definition looked at the population level of urban centres and commuting patterns of the areas surrounding the urban centre. In Switzerland, population level, commuting pattern, population growth rates, built-up area, population/job density and employment in the primary sector were

used to delimit agglomerations and isolated towns. All areas outside agglomerations and isolated towns were then considered to be rural. These are but a few examples of how population level and population density were used in definitions of rural areas. Very few countries did not refer to either population level or population density in the definition of rural. One of these exceptions was Romania where the "rural" status for a settlement was established by law without explicitly taking into account the demographic size or the population density. Similarly, in Kyrgyzstan the parliament decided on the status of every settlement.

Even when similar variables were used to distinguish rural from non-rural, the **thresholds applied could be very different**. For the population level of municipalities, for example, this threshold ranged from 200 (in Denmark) to 2,500 (in Estonia). Several definitions looked at the size of urban centres within a certain administrative area (for example, in Germany the threshold was an urban centre of 100,000 inhabitants within a region and in Bulgaria a municipality was only rural if the biggest town had less than 30,000 inhabitants). These examples also show that often rural was defined as the residual of urban.

The third element of the definition is the territorial unit on which the definition is based. According to the results of the 2003 survey, most **countries used existing administrative areas as the basic territorial unit**. Several countries, however, used statistical subdivisions that were mainly based on the organisation of the population censuses (for example, Australia, Canada and Ireland). In Denmark and Sweden, the definitions were based on addresses. These definitions had the advantage of being independent of relatively random administrative borders and of providing a flexible basis for summary statistics. This approach was possible in countries like Sweden and Denmark with a wide range of register-based statistics. In many countries, however, statistics at such a low level would require large resources. Rural markers would have to be added to sample surveys and the results would probably have to be compiled in two different ways - once in the traditional way to derive statistics for administrative areas and once to derive statistics on rural areas. For some statistics, such as those based on administrative records, this might not be possible.

The next question that was addressed was whether there was a need for a definition that distinguished **degrees of rurality**. The responses to the questionnaire seemed to suggest that there was a need for such a sub-division as more than half of the countries with an official definition of rural used some kind of sub-division of rural areas. The variables used to define degrees of rurality did not necessarily have to be the same as for the rural/non-rural definition. For example, the rural non-rural definition could be based on population level, whereas the sub-division could be based on the distance to an urban centre of a certain size.

Information from OECD on national definitions in its Member Countries[1]

FOCUS TABLE III.1
National statistical definitions of rural in OECD countries

Australia	*Standard Geographical classification*: Rural areas are defined as those areas other than urban. Urban areas are census Collection Districts (CDs) that contain people living in close proximity to others (at least 200 persons per square kilometer) in clusters of 1,000 or more persons. *Remoteness Area classification*: Developed in the late 1990s, this system classifies CDs into five broad classes of remoteness according to the Accessibility/Remoteness Index of Australia based on the physical road distance to five urban centres of various population sizes.
Austria	Rural areas are those areas which are non-urban or lack an urban centre. Urban is determined by population size and employment pattern.
Belgium	No definition was found
Canada	*Census definition:* Rural areas are those with a population of less than 1,000 and a density of less than 400 persons per square kilometre. *Rural and Small Town methodology*: Areas under 10,000 people outside the commuting zone of a census metropolitan area and census agglomeration area.
Czech Republic	Areas occupied by municipalities with less than 2,000 residents.
Denmark	Rural areas: Areas that are not urban, *e.g.* occupied by urban centres with less than 200 inhabitants. Rural area municipalities: municipalities, where the largest urban area as of 1 January 1999 had less than 3,000 inhabitants (valid up to 2007 when the municipal structure was reformed).
Finland	Three types of rural areas are distinguished based on their prospects for development: urban-adjacent rural areas, rural heartland areas and peripheral areas.
France	The French National Institute for Statistics and Economics defines predominantly rural areas as the total area occupied by small urban municipalities (communes) and by rural municipalities, those with less than 2,000 inhabitants.
Germany	Regions with a population density of below 100 inhabitants per square kilometer with an urban centre of 100,000 and more; and regions with a population density of below 150 inhabitants per square kilometer without an urban centre of 100,000 or more.
Greece	Rural areas are defined as the territories of communities with less than 2,000 inhabitants.
Hungary	*Narrow definition*: Less than 120 inhabitants per square kilometer or under 10,000 residential population at settlement level. *Broader definition*: Predominantly rural at NUTS4 level if 50% of the residential population lives in a settlement with a population density of under 120 inhabitants per square kilometer and significantly rural if 15 to 50% live in a settlement with a population density of under 120 inhabitants per square kilometer.
Iceland	No definition was found
Ireland	*Census definition*: Rural areas are defined as towns under 1,500 persons or open country.
Italy	Rural areas are those with a population density lower than 100 inhabitants per square kilometer.
Japan	*Classification of Agricultural Area (MAFF statistics)*: Rural areas are those which are not classified as urban. Urban areas are defined as the territories of municipalities with a population density of 500 inhabitants or more per square kilometer.
Korea	There are three categories of administrative regions in Korea: Dong (city center areas), Eup (suburbs) and Myeon (remote villages). Myeon are settlements with less than 20,000 inhabitants, but apart from that threshold, denominations are not based on strict criteria. Territories of Dongs are recognized as urban areas, and territories of Eup and Myeon are categorized as rural areas.
Luxembourg	No definition was found

[1]Supplied by Catherine Moreddu, of the OECD Trade and Agriculture Directorate

Mexico	The National Institute of Statistics, Geography and Informatics (INEGI) defines rural areas as the territories of the communities with less than 2,500 inhabitants.
Netherlands	There is no official definition of rural areas in Dutch statistics. The LEI define as rural, areas (on the basis of postcodes) with fewer than 100 addresses per km2 and with less than 10% built-up areas.
New Zealand	*Standard classification*: Rural is defined on a population basis as those areas outside centres which have 1,000 or more people, further separated into "rural centres" (with a population of 300 to 999 people) and "other rural". *Alternative classification*: Separates out the standard rural area into four different categories – rural areas with high urban influence, rural areas with moderate urban influence; rural areas with low urban influence; and highly rural/remote areas – based on workplace address.
Norway	There is no official definition of rural areas in Norwegian statistics. However, Norway has a standard classification of municipalities based on industry, population density and centrality.
Poland	Urban/rural areas are determined on an administrative basis by the Council of Ministers. Urban status us given to an area when it has sufficient infrastructure, urban character, spatial arrangement plan and at least 2,000 inhabitants.
Portugal	The OECD classification is applied at the NUTS3 level with the following adjustments: -NUTS3 parishes classified as PU are reclassified as PR if that they are less favoured. -NUTS3 parishes classified as IN are reclassified as PR if they are less favoured, or integrated into municipalities in which at least 10% of the economically active population is employed in agriculture and forestry. -NUTS3 parishes including population centres with at least 15,000 inhabitants are not classified as PR.
Spain	National Statistics Institute of Spain (INE): rural areas are defined as municipalities with less than 2,000 inhabitants. Intermediate rural areas are municipalities having between 2,000 and 10,000 inhabitants. Urban areas are municipalities with more than 10,000 inhabitants.
Slovak Republic	Areas of municipalities with less than 100 inhabitants per square kilometer and less than 5,000 permanent residents.
Sweden	The traditional definition is based on the dichotomy rural-urban, where urban is any agglomeration of more than 200 persons. Recently a more elaborated system of categories was proposed by the national Rural Area Development Agency which distinguishes different degrees of rurality based on travelling time. These are urban centres with more than 3,000, countryside close to urban centres, countryside and rural areas.
Switzerland	All the areas outside isolated towns and agglomerations are considered as rural. Agglomerations of 20,000 or more inhabitants and isolated towns of 10,000 or more are considered urban. To delimit agglomerations, the number of jobs (at least 2,000) and the commuting pattern (of the economically active population 85% or more work in the agglomeration). Commuting pattern, population growth rates, built-up area, population/job density and employment in the primary sector are used to decide if municipalities are part of an agglomeration or not.
Turkey	Areas occupied by municipalities with less than 2,000 residents.
United Kingdom	England and Scotland: All areas outside settlements with a population of 10,000 or more. Wales: All areas are rural except those of a small list of communities in towns and cities that were deemed to be entirely non-rural, e.g. with over 150 people per square kilometer

Focus on National Definition of Rural Areas at a Very Detailed Local Level – the Example of England and Wales (United Kingdom)

For national purposes the approach that classifies regions based on NUTS2[1] (counties and groups of counties) or NUTS3 (groups of local authority districts) may be far too broad-brush. For example, in the UK there are no NUTS2 regions classed as "predominantly rural" in England or Wales using the OECD definition, yet policies for rural areas clearly exist in both of these countries and there are concerns with the different conditions found there compared with those of non-rural areas.

Before 2001 in England at least ten different definitions were in operational use by public institutions, ranging from the largely intuitive through those based on single indicators (land use, population density and so on) to more formal statistical definitions based on multivariate analysis of indices deemed to indicate rurality. This proliferation hindered the integration of data for rural areas and had become a source of confusion.

In March 2001 the then Department of the Environment, Transport and the Regions (DETR) commissioned a study of urban and rural definitions used for policy purposes (SERRL *et al.* 2001). Several broad types of purpose for applying a definition of rural were identified, though the distinctions are not absolute (they have been rearranged and simplified from the original).

- For the statutory allocation of resources and rural policy targeting. Examples of this in England were "Right to Buy" provisions of legislation on rural housing, requiring a clear definition, and Rural Bus Grant and Rural Business Rate Relief for areas that qualify as rural.
- In the construction of various "headline indicators" for use in rural policy, such as those in the government's Rural White Paper issued in 2000.
- For constructing urban/rural statistical descriptions; this requires consistency between the geographical units used to create the urban and rural definitions and administrative areas.
- For analytical purposes; including the locating of survey points and population banding for sample survey and data reporting purposes.

The SERRL review concluded that the three sets of criteria commonly used to assess rurality (land cover, population characteristics, and social/economic organizations) had become, in a sense, increasingly out of step in the UK. The SERRL commented that "when it comes to defining and delineating urban and rural areas for policy (e.g. practical) purposes, (the fact that the terms "urban" and "rural" have become increasingly indistinct) means that no single solution is likely to meet more than a "fair proportion" of the range of "policy requirements"(SERRL *et al.* 2001). An important point is that any simple classification system (binary rural/non-rural classification or one that adopts a set of categories of rural types) is unlikely to be adequate for describing all the characteristics of rural areas that are of interest to policymakers. On the other hand, the use of multiple

[1]Nomenclature of Units for Territorial Statistics, the basis of area classification in the EU

definitions invites confusion, especially when non-experts attempt to combine datasets using different definitions. There is virtue in having a standard approach that can be widely shared across government departments.

In line with this thinking, a project was launched by a combination of government departments and agencies to develop a new rural definition that could be applied within policy to help target support to groups, communities and businesses. The new "rural" definition for England and Wales (Scotland and Northern Ireland preferred alternative approaches) was launched by the Department for Environment Food and Rural Affairs" *Rural Strategy* in 2004 (DEFRA, 2004) and recognised as a "national statistic" by the Office for National Statistics shortly afterwards. It is based on population density (or, more strictly, household density) but in a flexible way that allows both settlement type and its context (in terms of the household density of the surrounding area) to be reflected. This system seems particularly appropriate for England, where the countryside often contains substantial settlements and where there is a wide variation in extent to which it is populated.

At its most detailed level it involves allocating each Census Output Area (units connected to the ten-yearly population census, containing of approximately 125 households) into one of eight different area types, as shown below, according to its settlement type and context. The process by which COAs are allocated is described in Focus Box III.1 below; it involves using a grid of 1 ha cells and a "moving window" that examines both the population density of that cell and the characteristics of its surrounding area. Thus two characteristics, *morphology* and *context* are at the basis of the new definition and it is built on very small geographical units. It should be noted that "rural" comprises the six types that are not explicitly "urban".

FOCUS TABLE III.2
England: Classification of Census Output Areas by Settlement Type and Context

Settlement type	Context
Urban >10,000	Less sparse
Town and fringe	Less sparse
Village	Less sparse
Hamlet and isolated dwellings	Less sparse
Urban >10,000	Sparse
Town and fringe	Sparse
Village	Sparse
Hamlet and isolated dwellings	Sparse

Source: CRC (2007), *Defining rural England.*

FOCUS BOX III.1
The basis of area classification system in England leading to the definition of rural areas (summarised from Shepherd 2007)

Two features of the rural settlement landscape are identified in the definition: settlement *morphology* and settlement *context*. Compared with the OECD recommendation of a 1km grid to define a local community level of rurality, this approach is 100 times more detailed. Furthermore it puts settlements in their wider context.

Every residential postal address in England and Wales (around 23 million addresses) is allocated to a 1ha grid cell. The key analytical step is the calculation of a *density profile* for each cell in the grid using a constant numerator but different denominators. For the identification of *settlement type* the denominators are set at 200m, 400m, 800m and 1600m around each cell. For the calculation of the much larger scale *context measure*, the denominators are 10km, 20km and 30km. chosen to represent average distances to services of different kinds. In Geographical Information Systems terms a 'moving window' consisting of a set of fixed denominator concentric density zones is passed over each cell in the grid and the average household densities at each scale are calculated for each cell.

Empirically it can be shown that different types of rural settlement exhibit a typical density profile. For example, a "compact village" would have a density of greater than 0.18 residences per hectare at the 800m scale, a density at least double that at the 400m scale and a density at the 200m scale at least 1.5 times the density at the 400m scale. In practice, the method was found to be capable of identifying at least nine distinct rural settlement types. The same principle was applied at wider geographic scales to identify the population *context* or 'density landscape' in which a rural settlement type is found. This can be interpreted as the generalized accessibility of a settlement (e.g. average expected distances) to town shopping, local authority services and emergency services. In the case of the new rural definition generalized densities were calculated at three scales: 10,000m, 20,000m and 30,000m.

The final stage is the classification of the Census Output Areas (or Super Output Areas) according the proportion of its population in each settlement type. In the case of the *settlement morphology* measure an area is classified according to the majority of resident population in one of three settlement types: rural town, village and 'dispersed' dwellings. In the case of *settlement context* an area is "scored" as "sparse" if it has the majority of its population at a specific level of average density in all three geographic scales.

In classifying Local Authority Districts six broad types are identified, three of which are urban. The main **rural** types are called "Significant Rural", "Rural-50" and "Rural-80", identified by the proportion of people in rural settlements of all kinds: "Rural-80" LADs have between 80 and 100 percent of inhabitants in rural settlements, "Rural-50" LADs have more than 50 percent, whilst "Significant Rural" LADs have more than the national average of 26 percent. These broad classes can, if required, be further broken down into the different *types* of specifically rural settlement they contain. Most "Rural 80" LADs, for example, have a predominance of people living in villages.

A full discussion of the definition methodology and results with detailed mapping can be found on the Office for National Statistics website at http://www.statistics.gov.uk/hub/index.html, the Defra website at http://www.defra.gov.uk/ and on the Rural Evidence Research Centre website at www.rerc.ac.uk

The core classification of Census Output Areas (COAs) has been adapted for larger geographical units that comprise multiple COAs, including Electoral Wards (the smallest unit of local government) and Local Authority Districts (LADs). It might be argued that it is the ability to classify LAD that is the more useful. Much official data for England is only collected at the level of the 354 LADs into which England is divided. These are allocated to one of six broad classes based upon the number and proportion of their populations in the main settlement types derived from the "local" rural definition. Three classes are predominantly **urban** in nature: "Major Urban", "Large Urban" and "Other Urban" comprising 176 LADs in all.

The main **rural** types, of which there are 178, are called "Significant Rural", "Rural-50" and "Rural-80", identified by the proportion of people in rural settlements of all kinds: "Rural-80" LADs have between 80 and 100 percent of inhabitants in rural settlements, "Rural-50" LADs have more than 50 percent, whilst "Significant Rural" LADs have more than the national average of 26 percent. These broad classes can, if required, be further broken down into the different *types* of specifically rural settlement they contain. Most "Rural 80" LADs, for example, have a predominance of people living in villages.

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CRC (2007). *Defining rural England.* Commission for Rural Communities.

Defra (2004). *Rural Strategy 2004.* Department for Environment, Food and Rural Affairs, London.

SERRL *et al.* (2001). *A Review of Urban and Rural Area Definitions - Preliminary Draft Final Report*, Department of the Environment, Transport and the Regions, London.

Shepherd, J. (2007). *What is Rural? Some Key Definitional Issue*s. Paper to the University of London/Penn State/ERS: Design and Evaluation of Public Policies for Rural Development Workshop 1: Public Policy and Rural Development an EU/US Comparison Wye, Kent June 25-26.

United States	*Census Bureau Definition:* Urban areas are defined as "core census block groups or blocks that have a population density of at least 1,000 people per square mile and surrounding census blocks that have an overall density of at least 500 people per square mile". Any territory not defined urban is considered rural. These definitions are made at a sub-county level. *Office of Management and Budget metro and non-metro classification:* Metropolitan areas contain: (a) core counties with one or more central city of at least 50,000 residents or with a Census Bureau - defined urbanized area (and a total metro area population of 100,000 or more), and (b) adjacent counties linked through commuting ties. Non-metropolitan counties are outside the boundaries of metropolitan areas and have no cities with as many as 50,000 residents. *ERS Rural-Urban Continuum Code*: a nine category system that classifies counties from most urban to most remote rural. Metropolitan counties are classified into three categories based on population size: non-metro counties are classified into six categories based on their degree of urbanization and adjacency to metro areas. *Official Federal definition:* Rural areas comprise places (incorporated or unincorporated) with fewer than 2,500 residents and open territory.

FOCUS PIECES

OECD (1998), *Annex 3* of UNECE (2007), *MAFF* Japan (2006), *MAFF* Korea (2006) & *Country Reviews*, Box 1.1

Focus on OECD Typologies of Regions in Member Countries

Attention here focuses on the methodology used by the OECD to classify regions according to their degrees of rurality in its Members. The OECD methodology is the only one internationally recognised, even if the results are sometimes considered as imperfectly reflecting the rural character of areas, particularly in densely populated regions. The results may differ from those based on national definitions. They are, however, essential in order to enhance the international comparability of data.

The OECD considers "rural" as a spatial or territorial concept. The main focus is on people, land and other resources in the open country and small settlements outside major urban centres; furthermore, it is not restricted to any particular use of land, degree of economic development, or productive sector. The attention to rural economies and to rural problems is a common denominator of OECD member countries. Nevertheless, they recognize that the diversity of rural conditions and national goals means that each country will need its own policies for rural development.

The design of the territorial scheme, which provides the geographic grids for the collection, aggregation and presentation of statistical data, is of key importance for all kinds of rural analysis.

Regional grids

In any analytical study conducted at sub-national levels, the first step is to define the territorial unit because the word "*region*" may have different meanings within and among countries. To address this issue, the OECD has classified regions within each member country. The classification is based on two territorial levels which refer to the NUTS system[1]. The higher level (territorial level 2 – NUTS2) consists of 335 large regions, while the lower one (territorial level 3 – NUTS3) is composed of 1,681 small regions. All the regions are defined within national borders and often correspond to administrative regions (see Focus Table III.3). Each NUTS3 region is contained within a NUTS2 region (except in Germany and the United States).

This classification – largely consistent with the Eurostat classification for European countries – facilitates comparability between regions at the same territorial level. Indeed, these two levels constitute the framework for implementing regional policies (OECD, 2009).

[1]The NUTS classification was created and developed according to the following principles:
a) The NUTS favours institutional breakdowns. Different criteria may be used in subdividing national territory into regions. These are normally split between normative and analytic criteria:
1) normative regions;
2) analytical (or functional) regions;
3) institutional divisions.
b) The NUTS favours regional units of a general character. A territorial unit specific to certain fields of activity (mining regions, rail traffic regions, farming regions, labour-market regions, etc.) may sometimes be used in certain Member States. NUTS excludes specific territorial units and local units in favour of regional units of a general nature.
c) The NUTS is a five-level hierarchical classification (three regional levels and two local levels). Since this is a hierarchical classification, the NUTS subdivides each Member State into a whole number of NUTS1 regions, each of which is in turn subdivided into a whole number of NUTS2 regions and so on (*OECD Glossary of Statistical Terms*, http://stats.oecd.org/glossary/detail.asp?ID=6640).

FOCUS TABLE III.3
Regional grid of OECD member countries

Region	NUTS2	Non Official Grid (NOG)	NUTS3
Australia	States/Territories (8)	LFS, Dissemination Regons (30)	Statistical Divisions (60)
Austria	Boundeslander (9)	-	Gruppen von Politischen Bezirken (35)
Belgium	Régions (3)	-	Provinces (11)
Canada	Provinces de Territories (12)	LFS, Economic Areas (71)	Census Division (288)
Czech Republic	Oblasti (8)	-	Kraje (14)
Denmark	Regions(3)	-	Amter (15)
Finland	Suuralueet (5)	-	Maakunnat (20)
France	Regions (22)	-	Départements (96)
Germany	Lãnder (16)	-	Spatial planning regions (97)
Greece	Groups of Development regions (4)	-	Development regions (13)
Hungary	Planning Statistical Regions (7)	-	Counties + Budapest (20)
Iceland	Regions (2)	-	Landsvaedi (8)
Ireland	Groups Regional Authority Regions (2)	-	Regional Authority Regions (8)
Italy	Regioni (21)	-	Province (103)
Japan	Groups of prefectures (10)	-	Prefectures (47)
Korea	Regions (7)	-	Special city, Metropolitan area and Province (16)
Luxemburg	State (1)	-	State (1)
Mexico	Estados (32)	-	Grupos de Municipios (209)
Netherlands	Landsdelen (4)	-	Provinces (12)
New Zeland	Groups of regional Councils (2)	-	Regional Councils (14)
Norway	Landsdeler (7)	-	Fylker (19)
Poland	Voïvodships (16)	-	Subregions (45)
Portugal	Comissaoes de coordenaçao regional + Regioes autonomas (7)	-	Grupos de Concelhos (30)
Slovak Republic	Zoskupenia Karajov (4)	-	Kraj (80)
Spain	Comiunidades autonomas (19)	-	Provincias (52)
Sweden	Riksomraden (8)	-	Län (21)
Switzerland	Grandes regions (7)	-	Cantons (26)
Turkey	Regions (26)	-	Provinces (81)
United Kingdom	Government Official Regions + Countries (12)	-	Upper tier authorities or groups of lower tier authorities or groups of unitary authorities or LECs or groups of districts (133)
United States	States (51)	-	Economic Areas (179)

Regional typology

The OECD regional typology is based on the three following criteria (OECD, 2009).

The *first criterion* (based on OECD, 1994) identifies rural communities according to population density. A community is defined as rural if its population density is below 150 inhabitants per square kilometre (500 inhabitants for Japan to account for the fact that its national population density exceeds 300 inhabitants per square kilometre). This step requires information on population and areas, and classification can only be undertaken with a long periodicity (in general every 10 years when a population census is made) (OECD, 2009).

However, the diverse "geography" of each region represents another important issue for the analysis of regional economies. It is useful to highlight that very different areas could be classified at the same level; for instance, in the United Kingdom the highly urbanised area of London and the rural region of the Shetland Islands are both considered TL3 regions. To account for these differences, the OECD has established a *second criterion* which classifies regions according to the *degree of rurality*, the percentage of population living in rural communities. This further classification enables meaningful comparisons between regions belonging to the same type and level (OECD, 2009).

The general rule is that a NUTS3 region is classified as:

- Predominantly rural (rural or PR), if more than 50% of its population lives in rural communities.
- Predominantly urban (urban or PU), if less than 15% of the population lives in rural communities.
- Intermediate (IN), if the share of population living in rural communities is between 15% and 50%.

According to Huillet (1993), PR regions are usually remote areas with the lowest population densities, often the lowest incomes and older populations, depend heavily on primary sector employment, and generally provide the least adequate basic services. Conversely, PU regions have been gaining population, have employment based in one or more of the secondary or tertiary sectors – though farming may be still a key part of land use - and are likely to face potential threats to the environmental, social and cultural heritage. Finally, IN regions are characterized by economic and social vitality of individual communities that varies considerably. Their economies are more likely to depend on a mix of primary and secondary sectors. In many countries, larger scale farming operations are likely to be found in these intermediate areas.

Finally, the *third criterion* is based on the size of the urban centres, accordingly (OECD 2009):

- A region that would be classified as rural on the basis of the general rule is classified as intermediate if it has a urban centre of more than 200 000 inhabitants (500,000 for Japan) representing no less than 25% of the regional population.
- A region that would be classified as intermediate on the basis of the general rule, is classified as predominantly urban if it has a urban centre of more than 500 000

inhabitants (1,000,000 for Japan) representing no less than 25% of the regional population.

The typology is calculated only for the lower territorial level (NUTS3); the dimension of NUTS2 regions is too large to allow for a categorisation into predominantly urban, intermediate or predominantly rural.

For analytical purposes the percentage of a population living in PU, IN, and PR is calculated for NUTS2 regions by compiling the population by the regional typology of its NUTS3 regions. For example the NUTS2 region of Rhone-Alpes in France has 28% of its population living in NUTS3 regions classified as PU, 67% in NUTS3 IN regions and 5% in NUTS3 regions classified as PR (OECD, 2009).

Three types of region – degrees of rurality

Focus Tables III.4 and III.5 show the spatial distribution of total population and area respectively by the three types of regions (this is also shown in Focus Figure III.2, at the end of this section). On average, one quarter of the OECD population dwell in predominantly rural regions. These are those regions where the majority of people live in rural communities. At the other extreme, about 40% of the OECD population is concentrated in 5% of the territory in predominantly urbanised regions. The remaining one third inhabits the significantly rural, intermediate regions[2]. It should be remembered that even in the predominantly urbanised regions a certain share of the population, up to 15%, live in rural communities and that in the predominantly rural regions part of the population live in urban places (OECD, 1996).

Information on the differences in the territorial distribution of population between the three types of region provides another insight into the spatial organisation of Member countries. The graphical presentation in the form of a triangle in Focus Figure III.1 gives an overall impression of the national differences in the degree of rurality at the regional level.

For many OECD countries - in particular the Netherlands, Belgium, Germany, the United Kingdom and Switzerland - the population share increases from predominantly rural to predominantly urbanised regions. For Austria and the Scandinavian countries, however, the opposite is the case. Here, less than a quarter of the population live in predominantly urbanised regions. In other Member countries - France and Spain, for example - the largest share of population is in the intermediate, significantly rural regions. Conversely, Ireland, Iceland, Greece and Portugal and also Canada and Australia have a dual structure with a greater share of their population inhabiting the rural and urban extremes and a smaller fraction living in the intermediate regions.

[2]The OECD now uses the term “intermediate” instead of “significantly rural”.

FOCUS TABLE III.4
Typology of regions by degree of rurality: shares of population in national totals* 1995 – 2005 (National total = 100)

	1995			2005		
Country Name	Predominantly Urban	Intermediate	Predominantly Rural	Predominantly Urban	Intermediate	Predominantly Rural
Australia	55	22	23	57	21	22
Austria	22	39	40	23	31	46
Belgium	81	17	2	83	14	2
Canada	44	23	33	54	17	29
Czech Republic	-	-	-	11	84	5
Denmark	23	38	39	29	32	39
Finland	21	32	47	26	21	53
France	29	30	30	29	55	17
Germany	66	26	8	50	40	10
Greece	35	18	47	36	24	40
Hungary	-	-	-	17	42	41
Iceland	57	8	35	0	62	38
Ireland	38	-	62	28	0	72
Italy	47	44	9	54	37	9
Japan	43	34	23	55	32	13
Korea	-	-	-	45	36	20
Luxembourg	0	100	0	0	100	0
Mexico	-	-	-	47	17	36
Netherlands	85	15	0	85	15	0
New Zealand	39	61	0	43	57	0
Norway	11	38	51	11	40	49
Poland	-	-	-	23	39	38
Portugal	41	24	35	52	27	21
Slovak Republic	-	-	-	11	63	25
Spain	35	46	19	45	42	13
Sweden	19	32	49	21	30	49
Switzerland	61	25	14	41	50	9
Turkey	12	30	58	47	25	27
United Kingdom	68	17	15	70	28	2
United States	30	34	36	43	20	37
OECD average	40	32	28	38	37	25

Source: OECD. "Creating rural indicators for shaping territorial policy". Paris, 1996,
OECD. “Regions at a glance”. Paris, 2009.

“Rural” communities = local communities with population density below 150 inhab./km^2, 500 inhab./km^2 in the case of Japan.
Typology of regions according to the share of rural population: “predominantly rural” = more than 50%; “significantly rural” = 15-50%; “predominantly urbanised” = below 15%.
Calculations based on most recent data available.

FOCUS TABLE III.5
Typology of regions by degree of rurality: shares of area in national totals* 1995 – 2005 (National total = 100)

	1995			2005		
Country	Predominantly urbanised	Intermediate	Predominantly rural	Predominantly urbanised	Intermediate	Predominantly rural
Australia	0	8	92	0	14	85
Austria	1	28	71	1	20	79
Belgium	57	28	15	61	25	15
Canada	1	4	95	1	3	96
Czech Republic	-	-	-	1	91	9
Denmark	1	31	68	5	28	68
Finland	1	16	83	2	10	88
France	5	34	61	4	55	41
Germany	42	39	19	20	53	27
Greece	3	16	81	3	25	72
Hungary	-	-	-	1	41	58
Iceland	1	24	75	0	1	99
Ireland	9	-	91	1	0	99
Italy	20	54	26	25	47	28
Japan	8	33	59	15	53	32
Korea	-	-	-	4	32	64
Luxembourg	-	100	-	-	100	-
Mexico	-	-	-	6	11	83
Netherlands	66	34	-	66	34	0
New Zealand	5	95	-	5	95	0
Norway	0	16	84	0	16	84
Poland	-	-	-	3	39	58
Portugal	6	13	81	9	22	70
Slovak Republic	-	-	-	4	64	32
Spain	6	39	55	14	42	45
Sweden	2	10	88	2	9	90
Switzerland	17	29	54	12	49	39
Turkey	1	17	82	21	28	51
United Kingdom	26	22	52	22	54	24
United States	5	10	85	13	9	78
OECD Total	3	10	87	6	14	80

Source: OECD. "Creating rural indicators for shaping territorial policy". Paris, 1996, OECD. “Regions at a glance”. Paris, 2009.

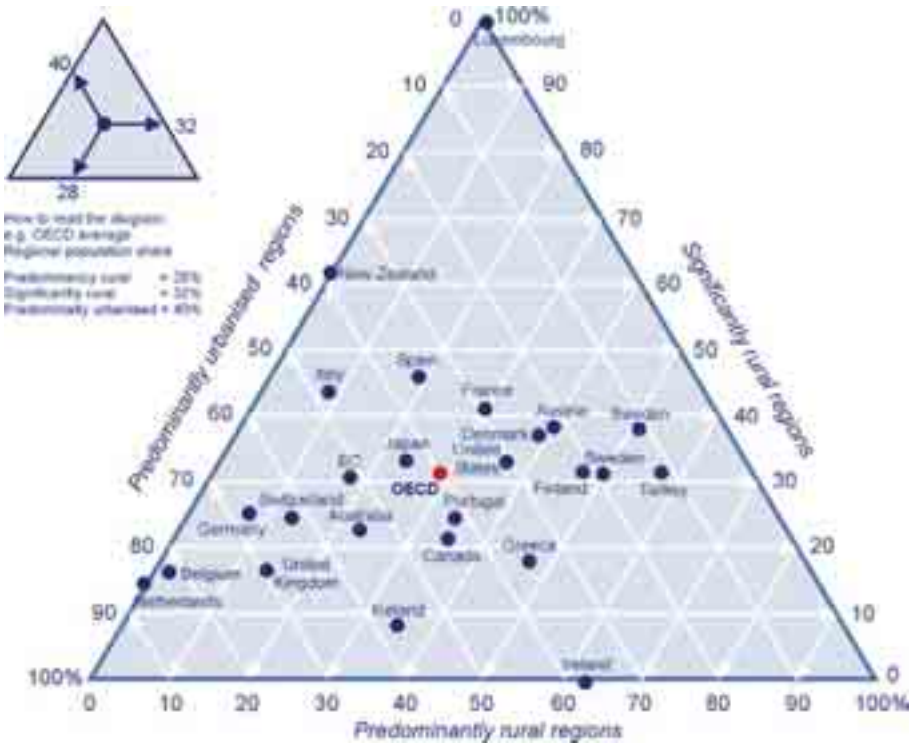
Focus Table III.5 shows that the percentage of the total OECD population living in rural communities has been decreasing. While in 1995 about one third of the total OECD population (250 to 300 million people) were living in rural communities, occupying over 90% of the territory, ten years later this share dropped to one quarter. National shares

differ, of course, ranging from a rural population of just under 2% in the Netherlands and Belgium to about 53% in Finland, 49% in Norway and 27% in Turkey.

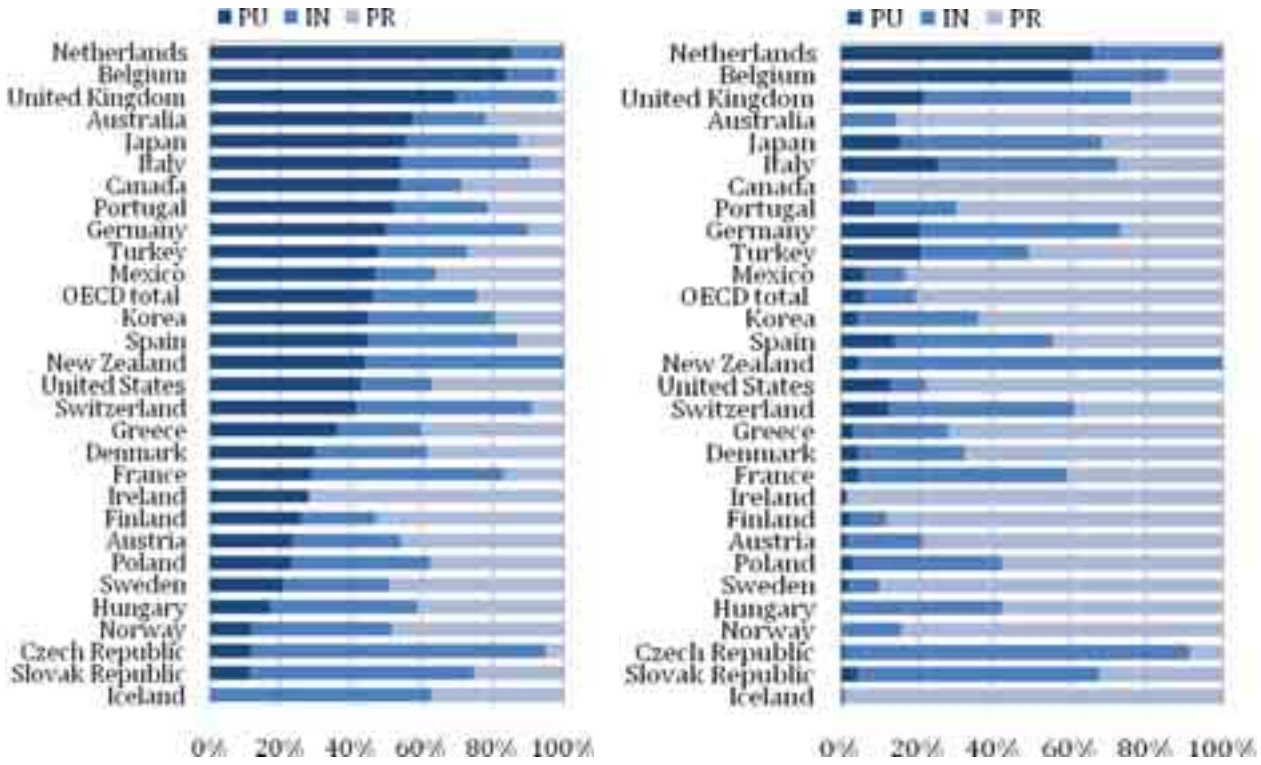
In some Member countries, the rural area is very large but only a small fraction of the population lives there. In others, the rural population is large and more equally distributed. Whereas for the OECD as a whole the ratio of the rural-to-urban population is about 1:4, it is less than 1:3 in Turkey, 1:2 in Norway or Finland and as much as 1:5 in Korea (OECD, 2009).

Even this simple comparison reveals certain commonalties and differences in settlement pattern amongst Member countries. It facilitates a better understanding of their perceptions of rural and their respective policy approaches (OECD, 1996).

FOCUS FIGURE III.1
Distribution of population by type of region (Regional populations share in national totals, %)



FOCUS FIGURE III.2
Distribution of population (left) and area (right) into predominantly urban, intermediate and predominantly rural regions (2005)



Source: OECD. *Regions at a glance*. Paris, 2009, p.55 (http://dx.doi.org/10.1787/523707103346)

FOCUS PIECES

Huillet, C., 1993. *The Rural Development Challenge In OECD Member Countries. Options Méditerranéennes, Skr.* A /n0 23, 1993 - Strengthening endogenous development patterns in European agriculture, http://ressources.ciheam.org/om/pdf/a23/CI000371.pdf

OECD (1996). "*Creating rural indicators for shaping territorial policy*". Paris, 1996.

OECD (2009). "*Regions at a glance*". Paris 2009 http://www.oecd.org/document/9/0,3343,en_2649_33735_42396233_1_1_1_1,00.html

Focus on Typology of Regions in the European Union (EU)

So far no official typology for the European Union exists despite several attempts to create one in the past, for example, adapting the OECD typology for certain purposes (Vidal *et al.*, 2001).

In the *Proposal on Agri-Environmental Indicators* (PAIS) report (see Chapter V), it is said that if one wants to move away from typologies based on spatial criteria, there are more sophisticated rural typologies based on structural approaches that take into account a variety of characteristics to describe rural areas[1]. A number of multivariate analyses of a broad range of socio-economic indicator variables have been used to develop more sophisticated definitions of rurality at national and European levels. Reference is also made to a multivariate index of rurality, based primarily on Census data (Bryden, 2001).

Similar structural approaches to rural-urban classifications have been used for targeting resources to rural areas. In demarcating areas for Objective 2 Structural Fund assistance, for example, **rural areas are defined by either (low) population density or a percentage share of the workforce employed in agriculture** (Bryden, 2001).

DG AGRI tried recently to use the OECD population density method and a land cover method (using Coordination of Information on the Environment - CORINE[2]) to come up with a first proposal combining the two approaches. However, for the time being this has to be seen as a pure academic exercise, which probably will be continued (Vard *et al.*, 2005).

The relationships between rural and urban areas extend beyond labour market flows however, as explored by the pilot Study Programme on European Spatial Planning (SPESP) conducted in 1998. They include home-work relationships, rural areas as urban consumption landscapes, rural areas as suppliers of natural resources for urban areas and central place dynamics. The SPESP identifies **a six-fold typology of European territories** based on population statistics and takes its point of departure from urban and rural relationships, although it utilises normative regions. These regions are:

- regions dominated by a large metropolis
- polycentric regions with high urban and rural densities
- polycentric regions with high urban densities
- rural areas under metropolitan influence
- rural areas with networks of medium-sized and small towns

[1]The overall objective of the PAIS project is to contribute to the on-going development of Agri-Environmental indicators of the European Commission, as outlined in COM (2000) 20 and COM (2001) 144. A specific focus of the PAIS project is directed at the following three indicator themes: Landscapes, Agricultural Practices, and Rural Development.

[2]The CORINE Land Cover project was adopted by the European Commission in 1985 (Directorate General "Environment") then managed by the European Topic Centre of the European Environment Agency in 1993. The aim of Corine Land Cover is to provide information on land cover and on the state of the environment in the European Union. Corine Land Cover is a cartographic tool which covers every national territory where the survey is undertaken (EEV, 1999).

- remote rural areas

Using NUTS2 and 3 data, territories are distinguished on the basis of urbanisation rate, rural population density, the degree of contrast in the distribution of settlement size, average distance to urban settlement, the primacy of the largest city and the size of the largest centre. The study stresses that more refined typologies are needed (NUTS4 and 5) to be relevant for the analysis of sparsely populated areas where relationships are formed between small and medium-sized towns and rural areas (Bryden, 2001).

FOCUS PIECES

Bryden, J. (2001). *Section 3: Rural Development*. In *Landsis g.e.i.e. Proposal on Agri-Environmental Indicators PAIS*. Luxembourg.

European Environment Agency (1999). *Corine Land Cover – a Key database for European Environmental Assessment*. http://etc-lusi.eionet.europa.eu/CLC2000/docs/publications/corinescreen.pdf

Vidal, C., Eiden, G. & Hay, K. (2001). *Agriculture as a key issue for rural development in the European Union*. Conference on Agricultural and Environmental Statistical Applications (CAESAR), Rome. www.unece.org/stats/documents/ces/ac.61/2001/wp.2.e.pdf

CHAPTER IV

CONCEPTUAL FRAMEWORK – RURAL DEVELOPMENT INDICATORS

IV.1 THE GLOBAL STRATEGY CONCEPTUAL FRAMEWORK FOR AGRICULTURAL AND RURAL STATISTICS

Statistics on agricultural and rural development are used by policy makers, donors and private sector decision makers to inform their decisions regarding a variety of important issues. It is these issues that drive the choice of indicators to be developed and the core data to be collected. Various attempts have been made to quantify the value of information to public and private sector decision makers, and the many case studies examined in literature reviews suggest that the benefits of having the information generally far outweigh the costs of providing it.

Many of today's critical issues are not new, but they have increased in importance, have come to be framed differently or have been newly recognized. Therefore, many traditional indicators remain relevant, while others need to be refocused or developed anew. One important finding of the *"Global Strategy To Improve Agricultural And Rural Statistics"* (World Bank *et al.*, 2011) was the considerable overlap between the issues identified by different stakeholders, including national statistical agencies, non-governmental and donor organizations, research institutions and many other users. Multiple users expressed the need for new and improved indicators on prices, energy and biofuels, agricultural environments, climate change, trade, water, land, soils, household consumption, food security, socio-economic data, economic accounts, management of natural disasters and fisheries. They also had high expectations for geospatial and remote sensing data and expressed the need for improved integration and for more accessible and searchable databases.

The most critical issues are not independent from each other, and much of the data are needed for more than one indicator. The goal of the Global Strategy is to capture the interrelationships of these emerging issues and to ensure that appropriate indicators are defined and underlying data provided. This points to a major problem with current

agricultural and rural statistics: many of the issues have been considered in isolation, and this does not allow the cross-cutting analysis that is most desperately needed.

IV.1.1 DIMENSIONS OF DATA DEMAND

While agriculture is fundamentally an economic activity, in that its purpose is the production of food and other commodities, concern about its relationships to environmental and social issues has been increasing. These relationships have to be considered in a broader context in which agriculture, the environment and social factors are no longer treated as discrete disciplines. Institutions and enterprises affect all three through policies, regulations, taxes and infrastructure such as transportation, education, markets, and processing facilities.

The economic dimension of agriculture

The economic dimension consists of the land, labor and capital that enter into the production process and the outputs that result from it. It covers markets and farm and non-farm income. The output of the production process takes many forms: some are consumed by the household, some are retained for seed or feed to be used on the agricultural holding, and others enter supply chains that extend to markets.

Some of the products require processing, such as crushing soybeans for oil, ginning cotton, or the slaughter of livestock by non-agricultural enterprises. An emerging output is the use of agricultural commodities for the production of energy products. The outcome of the production process is income to the agricultural and non-agricultural enterprises, and to households – both agricultural and non-agricultural. The impact of the production process affects food security, poverty, and the sustainability of the environment and the economy.

The environmental dimension of agriculture

The environmental dimension consists of the sector's role as a user of environmental resources – principally land and water – and as a provider of environmental services. In addition to its direct use of natural resources in production, its impacts also relate to the waste and emissions generated by production. Agriculture can affect the condition of the resources it uses, with important implications for climate change and biodiversity. Recognition of the negative and potentially positive impacts that agriculture has on global, regional and local environments points to the need for statistics that enable informed analysis of the interaction between agriculture's role in the economy and in the environment.

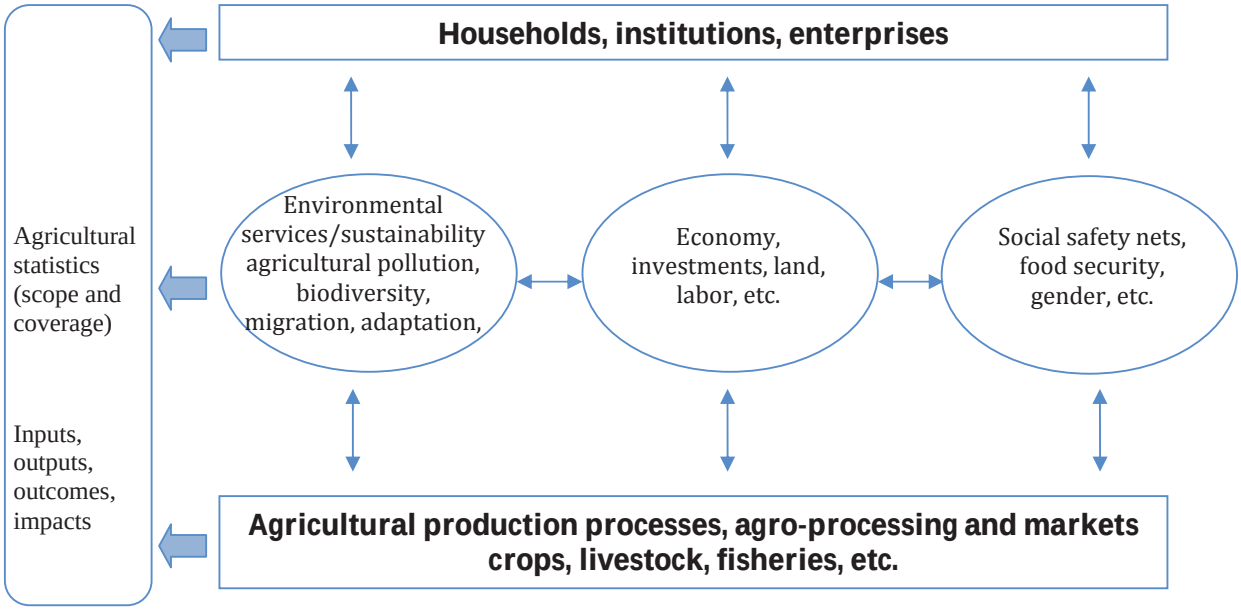
The social dimension of agriculture

The social dimension covers the need to reduce risk and vulnerability, including food security and issues related to gender. Data that relate to this dimension of agriculture and rural development begin with households and household members – both farm and non-farm. This represents a higher level of detail than was captured by much conventional data, which more often began with the farm enterprise as its basic unit. Including non-farm rural households also serves to develop a broader and more complete picture of rural communities and the multitude of interdependencies that

characterize them. Rural communities are far more than spatial clusterings of households located in sparsely populated areas. Understanding the interactions between rural households, business and government agencies – and between communities – generates the need for extensive data. It is especially important that the combination of agricultural and non-agricultural income sources among households, farms and non-farm businesses be represented with data, given the significance of seasonality to food security among vulnerable households and individuals. Data are very important also in examining the relationships that exist between agriculture and other sectors in rural society. Finally, social data are needed to examine households and individuals not only in their roles as producers and consumers, but also as users of social services such as health and education programs.

These three interconnected dimensions combined with desired high priority outcomes provide a map of data demand.

FIGURE IV.2
The conceptual framework for agricultural statistics



Source: World Bank, FAO and UNSC (2011). *Global Strategy to Improve Agricultural and Rural Statistics*. Report no 56719-GLB. World Bank, Washington DC.

IV.2 GENERAL NATURE OF INDICATORS

IV.2.1 INTRODUCTION

Indicators are statistical variables that help to transform data into relevant information. Indicators have meaning within defined conceptual frameworks and for specific analytical or administrative purposes. To provide meaningful information, they have to

be interpreted in the context of these frameworks and purposes. While some indicators can realistically fall within the coverage of official statistics because they meet the necessary quality criteria, others may not.

There is no general internationally-accepted definition of what constitutes an indicator as a special subset of statistical results that would be applicable to all areas of official statistics (Brüngger, 2004). However, the term "indicator" is used with increasing frequency. One reason may be that the terms "statistics" or "statistical results" do not attract as much attention from users and the media as the term "indicator." The implicit undertone of the term indicator is that it is more than an "ordinary statistic," such as the size of the population or tonnes of cereals produced, and as a result indicators deserve more attention than ordinary statistics. In practice, in rural development both "ordinary" statistics and more complex formulations are used as indicators. The need to exercise caution when synthesising indicators is returned to later.

Thus the term "indicator" has both a generic meaning (implying quantitative information) and a more specialist technical meaning. Using the word in the first sense, indicators offer the possibility of establishing rankings or league tables if applied to comparisons of regions, countries, or other appropriate units, for the same period[1]. They also allow a statement of "better"/"worse" (including a quantification of the difference), both in comparisons over time and across space. The indicators used in this normative way may be simple or complex.

Another interpretation of the term concerns those indicators that cover only a part of a target concept, which remains unmeasured within the framework of official statistics. This type of indicator can be found normally in areas that lack a common measurement unit (e.g. health, education, quality of work or crime), environmental statistics and some new phenomena covering aspects of both economic and social statistics such as globalization, competitiveness and the information society. In this second approach, the term indicator stands for something broader than what it actually measures.

Indicators can be powerful tools for analysis, planning, monitoring and evaluation if the trade-off between their strength (reduction of complexity) and their weakness (over-simplification) is carefully considered. Appropriate methodology has to be used when building indicators to deal with issues of aggregation over time, space and contributing variables. Thorough interpretation, therefore, is a necessary prerequisite to any reasonable indicator use. Often individual indicators can be interpreted adequately only as part of a more comprehensive set of indicators.

Focus on the Aggregation Problem

Without explicit reference to a specific analytical task or policy objective, indicators are just statistical data or variables that provide only potentially useful information. The underlying logic relating certain statistical data to specified purposes must be based, at the very least, on a hypothesis, if not on a more elaborate theory or model. In fact,

[1]For example, the World Competitiveness Yearbook (WCY) ranks and analyses the ability of nations to create and maintain an environment in which enterprises can compete (http://www02.imd.ch/wcc/methodology/).

indicators can often be seen as a first attempt to structure complex interrelationships that may, in the end, help to formulate more sophisticated theories (OECD, 1996).
Indicators on rural development need to be based on **(1) published statistics** that are **(2) consistently collected** in **(3) comparable areas**, using the **(4) same unit** of measurement and based on a **(5) clear definition**. Indicators should also be **(6) sensitive to changes and trends over time** that can inform future policy direction. To meet these demands, descriptive indicators for rural development often involve re-valuing well-known concepts and data sets in the rural policy context (Bryden, 2001).

In particular the following three questions should be addressed in the selection process:

- What are the basic requirements for the construction of any indicator?
- What are the specific rural development dimensions that have to be captured by rural indicators?
- What are the purposes of collecting and providing indicators? (OECD, 1996).

IV.2.2 QUALITY OF INDICATORS

The perception of good quality of indicators has been articulated many times by international organisations and independent commentators, typically overlapping heavily. Particular attention must paid to the quality of statistical data to be used as input to construct indicators and their sources, availability of meta-data and suitability for international benchmarking.

Relatively early, the FAO considered the issue of good quality in the World Conference on Agrarian Reform and Rural Development (WCARRD) held in Rome in 1979. The following properties were considered necessary for socio-economic indicators when monitoring activities. They should be**:**

- relevant
- valid
- objective and verifiable
- sensitive
- feasible
- timely
- simple

If an indicator was weak in one of these properties a secondary indicator should be included. Based on these considerations, OECD and European Union have presented similar lists of desirable features.

Focus on OECD Indicator Requirements

Focus on the European Union Indicator Requirements and Their Assessments

More recently FAO, in the process of creating the CountrySTAT database, proposed the following properties for data quality and metadata requirements (FAO, 2010):

- Relevance (legal and institutional environment, resources, transparency)
- Comparability across the country (concepts and definitions, scope, classification)
- Accuracy (source data, assessment of source data, statistical techniques, assessment and validation of reliability intermediate data and statistical outputs)
- Timeliness and punctuality (periodicity and timeliness, geographical coverage, consistency, revision policy and practice)
- Accessibility (data accessibility, metadata accessibility).

IV.2.3 DIMENSIONS OF INDICATORS

Three dimensions may be identified when assembling any indicator:

1. the **state** or situation or level of the indicator,
2. the **dispersion** or concentration or variability of this indicator, and
3. the **tendency** or trend of this indicator over time.

Each dimension of a given indicator adds important information for the policy discussion in rural development. The purpose of statistical indicators is to highlight those aspects considered sufficient to describe the socioeconomic and environmental characteristics. First, to summarise the phenomena it is necessary to produce some measures of the **level.** These have to include only principal and uncorrelated components. Second, some measures of component **dispersion** and **concentration** should be provided. Finally, are things **improving** or **getting worse** – what is the trend over time?

The household is commonly the unit of observation for which data are tabulated for each rural territorial unit[2]. An example of an indicator calculated on the household basis is the normalised mode of per capita real income of the household in a given year in a given rural area[3]. The dispersion and concentration of this variable can be measured in various ways, such as by the normalised squared error from the mode and the Gini Index of Inequality (see Chapter XI later in this Handbook for a review of measures of inequality in the context of agricultural household incomes).

An example of an indicator not on a household basis might be the normalised mortality rate for children under 5 years of age for a given year for a given rural area, calculated from an administrative database. The dispersion and concentration indicators could be calculated across all similar rural areas.

It is often useful to have a measure of **tendency over time**. For many characteristics of rurality, time series data are necessary to calculate the inter-temporal rates of improvement or growth, or the average of these rates over a set period of time.

[2]In some cases, the rural area itself becomes the unit of observation in cases where the statistical agency might publish data collected from an administrative data source (such as the municipal budget allocated to education for a given rural territorial unit) or provide estimate significant only at given administrative level.

[3]Mode, or at least median, is suggested for variables that are not normally distributed among the population even if in practical terms, as a first approximation, normal mean is applied.

Averaging the rate of growth over, for example, five years might be preferable for understanding tendency because short-term volatility will be excluded.

Finally, each dimension (**level**, **dispersion** and **tendency**) of an indicator for a given rural territorial unit may be compared to other rural territorial units or to urban territorial units to obtain a measure of imbalance in development or to measure a socioeconomic and environmental discrepancy.

IV.2.4 "SOFT" AND "HARD" INDICATORS

A distinction is sometimes made between "soft" and "hard" indicators. Hard indicators are thought of as those aspects of situations that can be measured directly (e.g. number of jobs, time spent, income, cost), while soft indicators relate to less tangible conditions, such as skills, satisfaction or expectations, that must be measured indirectly. Often both types apply to a particular policy issue. For example, beneficiary opinions of the impact of agri-environment schemes on biodiversity on their farms would be "soft" whereas the changes in the observed number of farmland birds (which scientific evidence may link with a complex mix of biological changes at field level) would be "hard".

As an example, in Italy area-based indicators were used in two different ways when evaluating progress under regional policies taking place under the EU Community Support Framework (CSF) 2002-2006. In "soft" applications, indicators were used to measure final objectives and were usually broad context ones to assess effectiveness across multiple territories. These indicators can serve to identify the relative strengths and weaknesses across units being measured, reduce the degree of fuzziness of regional policy analysis, and increase the accountability broadly of all the stakeholders involved in decision making. However, because of their limitations, "soft" indicators are difficult to use for a robust evaluation of the performance of policies or of those who implement the policies. "Hard" applications of indicators were often used to measure intermediate objectives of policies, where their attainment, such as establishing a new institutional arrangement, was a necessary step for achieving the policy aims. Incentives or sanctions are more easily implemented for these hard indicators where the implementer has control over the output (OECD, 2006).

A similar distinction can be made between the indicators used in assessing the performance of policy interventions under EU Rural Development Programmes for the period 2007-13 in Member States. Indicators used to establish baseline conditions and impacts of entire Programmes may be relatively "soft". For example, if the measure's aim is to improve the skills of the agricultural labour force, a baseline which looks at the perceived adequacy of existing skills will be based on assessments ("soft") which are likely to be subjective as least in part; whereas indicators applied to individual schemes, such as the numbers of training days provided, will be "hard".

These examples suggest that the combined use of "soft" and "hard" indicators can improve the effectiveness of evaluations and help develop over time a "culture of evaluation" (OECD, 2006).

IV.3 THEMES AND SET OF INDICATORS

The selection of indicators for rural areas must be guided in part by the principles applicable to any set of indicators, but it must be driven even more by characteristics that are specific to rural development. There are three basic aspects of rural development, which any reasonable assessment of conditions in rural areas and trends must take into account:

- **Territory**: Rural development is a spatial concept. It deals with territorial differences in problems and perspectives, options and opportunities. Such differences can be considered positively (diversity) or negatively (disparities). In either case, the territorial distribution determines the overall performance and viability of economic, social and environmental systems as well as the effectiveness and efficiency of related policies.
- **Themes**: Rural development is a multi-sectoral concept. It is concerned with a wide range of demographic, economic, social and environmental issues. It stresses the importance of a cross-sectoral perspective and often provides an appropriate framework for the horizontal integration of various activities and policies.
- **Time**: Rural development is a dynamic concept. It is concerned not with the mere passing of time but with concrete, historical dynamics which are reflected in changing technological options, economic structures, or social attitudes and perceptions.

Any set of indicators for rural areas, therefore, has to provide information on a variety of economic, societal and environmental subjects. It has to do so in a territorially differentiated manner and it should be capable of reflecting changes over time (OECD, 1996). Within the themes, a statistical reduction of strongly correlated indicators is encouraged to reduce overlapping information (where closely similar indicators tell the same story), to further economy in the provision of public services, and to avoid the negative effect of excess information that produces 'noise' for users and potentially reduces their understanding (Gianfaldoni *et al.*, 2009).

In terms of what themes indicators should attempt to depict, clearly this depends on the nature of the problem and policy in hand. The observation of rurality can be done from several perspectives, suggested by different theories of development, which in turn lead to corresponding themes of interest. For example, if the focus is on the development process, the discussion on indicators might start from a framework for understanding "sustainable livelihoods" as suggested by the UK's Department for International Development (DFID). DFID defines livelihood as the combination of "the capabilities, assets and activities required for a means of living"[4].

[4]Introduction to the Sustainable Livelihoods Approach (www.livelihoods.org/info/info_guidancesheets.html)

Within this livelihood context the core analytical framework starts from the so-called **asset pentagon**, which contains the following five categories:

1. **natural capital**
2. **financial capital**
3. **human capital**
4. **physical capital**
5. **social capital**

Communities and regions achieve desired outcomes by applying strategies that exploit these assets. Indicators or statistics on strategies are difficult to conceptualize and, typically, the strategy that works for one community or region will not be appropriate for another. However, some indicators or statistics may be proposed that measure the potential for development, requiring a further (sixth) category:

6. **The capacity of the community/region to generate and to implement strategies .**

Finally, indicators of **Desired Outcomes** would need to be monitored.

An indicative generic approach is provided in the following supporting document.

Focus on the Selection of Rural Indicators

An example of themes within statistics, required for a specific type of rural development policy, is provided by the EU, where part of the Common Agricultural Policy (its Pillar II) is concerned with the role that agriculture (broadly defined) can play in improving the economic, social and environmental conditions in rural areas, and its choice of themes for indicators, needed to service this policy, reflect that particular orientation.

Focus on European Union Rural Development Themes

Sets of stage-related indicators to evaluate rural development policies

Indicators carry out a range of functions in the policy process by which governments attempt to foster rural development and by which the performance of policies, aimed at improving conditions in rural areas, are evaluated. A prominent example of a formal system of evaluation that uses sets of indicators at various stages is the EU's Common Monitoring and Evaluation Framework (CMEF) that applies to Rural Development Programmes operated under the Common Agricultural Policy (European Commission, 2006). Though the CMEF uses a particular terminology, the principles it embodies, including its set of indicators, are of general applicability.

Frequently statistics are needed about the situation in rural areas that gives concern before policy intervention is undertaken, that is to establish a **baseline.** This information will also feed into an analysis of the Strengths, Weaknesses, Opportunities and Threats (SWOT) that underlies the rationale for policy action. Under the CMEF two types of baseline indicator are encountered (see Box IV.1). The first (called *objective-related*) directly relate to the issues under concern and on which rural development policy focuses (for example, the incomes and productivity of rural residents). The

second type (*context-related*) relate to factors that are anticipated to affect the issues under concern in addition to the policy intervention itself (such as the pattern of land use and the proportion of the working population in rural areas). As policy actions are implemented there will be interest in how these indicators have moved from their initial levels. Evaluators will be concerned with the extent to which interventions have been the cause of shifts in levels or of alterations in trends.

However, evaluation of rural policy also involves indicators that measure the direct resource use and immediate impacts of interventions. While rural statistics are not likely to be concerned with the **inputs** or **outputs** of policy actions (for example with the cost of providing vocational training or the number of people trained), they will be increasingly affected by indicators of **results** (such as the gross number of jobs created) and the **impacts** of the interventions (the net number, once other factors such as displacement and multipliers have been accounted for)[5]. Evaluators will need to examine how the baseline indicators have changed over the life of a rural development policy and to explain how many of the observed changes can be attributed to the policy interventions that have taken place. Various techniques have been suggested by which this may be achieved (European Commission, 2010), though the less-than-ideal circumstances in which evaluation typically takes place (including data deficiencies) means that a degree of subjective judgement is always present. Thus while baseline indicators, to which statistics for rural areas bear a close relationship, are important to evaluating the performance of rural development policy, they do not provide a complete description of the process by which policy interventions work and how its performance can be assessed. Other information and process-linked indicators of inputs and outputs ("hard" indicators in terms of the description given above) will also be needed.

IV.3.1 THEMES FOR DEVELOPING COUNTRIES

Countries at different stages of economic development are likely to require rather different but overlapping sets of indicators to describe their rural areas, differences reflecting *in alia* the respective roles played by agriculture in generating incomes and providing employment. So far discussion here has tended to focus on OECD countries, but it is important to also consider the situation of developing countries and their particular needs in terms of the nature and balance between indicators required. Two main examples will suffice here.

[5]The indicators at the various stages of policy interventions are a feature of the **Logical Framework Approach (LFA),** a process and a tool often used in developing countries to help strengthen analysis and design during formulation, implementation, evaluation and audit (FAO, 2010). In the LFA context, the term "outcome" is used in place of "result".

BOX IV.1
Indicators at various stages of rural development policy (EU-CMEF)

Baseline indicators. They are used in the SWOT analysis and the definition of the programme strategy. They fall into two categories: (i)*Objective related baseline indicators*. These are directly linked to the wider objectives of the programme. They are used to develop the SWOT analysis in relation to objectives identified in the regulation. They are also used as a baseline (or reference) against which the programmes' impact will be assessed. Baseline indicators reflect the situation at the beginning of the programming period and a trend over time. The estimation of impact should reflect that part of the change over time that can be attributed to the programme once the baseline trend and other intervening factors have been taken into account; (ii) *Context related baseline indicators*. These provide information on relevant aspects of the general contextual trends that are likely to have an influence on the performance of the programme. The context baseline indicators therefore serve two purposes: (1) contributing to identification of strengths and weaknesses within the region and (2) helping to interpret impacts achieved within the programme in light of the general economic, social, structural or environmental trends.

Input indicators. These refer to the budget or other resources allocated at each level of the assistance. Financial input indicators are used to monitor progress in terms of the (annual) commitment and payment of the funds available for any operation, measure or programme in relation to its eligible costs.
Example: expenditure per measure declared to the Commission

Output indicators. These measure activities directly realised within programmes. These activities are the first step towards realising the operational objectives of the intervention and are measured in physical or monetary units.
Example: number of training sessions organised, number of farms receiving investment support, total volume of investment.

Result indicators. These pertain to the direct and immediate effects of the intervention. They provide information on changes in, for example, the behaviour, capacity or performance of direct beneficiaries and are measured in physical or monetary terms.
Example: gross number of jobs created, successful training outcomes

Impact indicators. These refer to the benefits of the programme beyond the immediate effects on its direct beneficiaries both at the level of the intervention but also more generally in the programme area. They are linked to the wider objectives of the programme. They are normally expressed in "net" terms, which means subtracting effects that cannot be attributed to the intervention (e.g. double counting, deadweight), and taking into account indirect effects (displacement and multipliers).
Example: increase in employment in rural areas, increased productivity of agricultural sector, increased production of renewable energy.

Source: Based on European Commission (2006). *Handbook on the Common Monitoring and Evaluation Framework*. DG-Agriculture and Rural Development, Brussels.

The first is generic. The World Conference on Agrarian Reform and Rural Development (WCARRD) held in Rome in 1979 provided the impetus for work on rural development statistics for the next decade. The World Conference recommended under Section ID (i) dealing with monitoring and evaluation that countries:

- Collect on a regular basis quantitative data and develop appropriate indicators on a number of specific items pertaining to the progress of agrarian reform and rural development.
- Establish benchmarks relating to the indicators for the years around 1980; and report on changes pertaining to these indicators at every other FAO biennial Conference.

The Programme of Action also recommended that the United Nations organizations, with FAO as the lead agency, consider the adoption of specific measures to assist countries in the above-mentioned tasks.

Rural poverty is a pervasive problem in many developing countries. There is therefore a need to systematically monitor its reduction. In developing countries some 70% of the poor reside in rural areas. Therefore, a country in this group cannot expect to raise itself out of poverty without specifically addressing poverty in rural areas (World Bank, 2000).

The World Bank has identified a number of key factors, which drive improvements in rural well-being, and grouped them into the following categories:

- Improvement in the rural economy. This necessitates improving agriculture productivity, fostering non-farm activities, expanding the market base, fostering the private sector, and developing rural infrastructure.
- Sustainable natural resource base. In most countries, rural economies are dominated by agricultural and natural resource-based activities. Many producers are already concerned about the deteriorating land and water base in their areas, and public awareness of environmental issues adds urgency to the search for solutions to conservation issues. There is therefore a general consensus that unless the natural resource-base is managed in a manner that ensures its continued productivity and environmental quality, growth in the rural economy will not be sustainable.
- Fostering an enabling "environment" for broad-based and sustainable rural growth: an appropriate overall macro-economic policy and a supportive institutional framework are essential to growth and poverty reduction, and for the success of development activities in rural areas. Policy frameworks and good governance that enable rural people to effectively influence public decisions that affect them are needed. Public investments are also more effective if they are provided in a decentralized and participatory way.
- Improving social well-being, managing and mitigating risk, and reducing vulnerability. To improve social well-being and minimize the vulnerability of the rural poor, developing countries should endeavour to improve access to nutrition and health services, help mitigate the effects of HIV/AIDS, increase access to rural education and improve its quality, and help improve food security for the rural poor. To achieve these objectives and foster broad-based growth and sustainable management of natural resources, it is essential to promote inclusiveness and remove barriers that exclude individuals on the basis of gender or ethnicity from economic and social opportunities.

In developing countries, it is expected that agriculture will remain the foundation of the rural economy for the foreseeable future. In Sub-Saharan Africa, for instance, agriculture accounts for 30% of GDP, 40% of exports, and 70% of employment (World Bank, 2000).

Specific examples of sets of indicators relating to rural development in non-OECD countries are available: the first relates to work by the FAO and the second to the documentation of the *Global Strategy to Improve Agricultural and Rural Statistics* (World Bank *et al.*, 2011) which seems to have largely superseded the former.

Focus on FAO Themes and Indicators

Focus on the List of Indicators from the Global Strategy

A further example relates to a specific non-OECD country – **China**. Almost 800 million, or 62.3%, of China's total population of 1,276 million people live in rural areas; as noted in Chapter V, these are defined as a residual to urban areas (including industrial and mining areas and development zones) (Zhiquan, 2002). In 2001, the per capita net income of Chinese rural households was 2,366 yuan, which was less than one quarter of the urban counterpart. Looking at the expenditure side, rural households accounted for only 25% of total retail sales. On the other hand, it is worth noting the tremendous success in reducing poverty in China – from some 250 million individuals living in poverty to about 30 million in just a few decades.

The first Chinese Agriculture Census showed that as many as 34% of the 230 million rural households were engaged in both agricultural and non-agricultural activities. Improved productivity in the agriculture sector is therefore essential for economic growth and for reducing poverty, whether it is China or Sub-Saharan Africa. However, this cannot be done by agriculture alone, which, in particular, the Chinese experience has shown. It has to go hand-in-hand with important contributions from non-agriculture activities and non-farm rural employment opportunities (Zhiquan, 2002; World Bank, 2000). In China, **agriculture, rural development** and **rural residence** are considered three dimensions of an **integrated rural system**, each with a set of core indicators being monitored.

IV.3.2 DATA ISSUES

The supply of data from which indicators may be constructed is dealt with in depth in Chapter VI. Here it is sufficient to note that, though the problem of data availability to construct indicators is by no means limited to developing countries, it is most acute there. The World Bank recognizes that there are considerable problems not only with the quality and reliability of rural data in many developing countries but also with the non-existence of vital data. Even when data are collected, most are aggregated at the national level with no possibility of breaking this down to urban-rural and regional levels.

The World Bank also stresses that improved monitoring of rural development will require a significant effort in data collection on a long-term basis. It advises against *ad hoc* surveys because these do not provide consistent coverage of the different aspects of rural development. Instead the World Bank proposes comprehensive household surveys

and extended coverage of the agricultural censuses, focusing on family status, access to services, economic activities, production practices, expenditures and social activity. Such census should be complemented by regular panel surveys using sub-samples (World Bank, 2000).

Recently, a joint team – composed by staff from the Global Donor Platform for Rural Development, the World Bank and FAO – has published the *Sourcebook of indicators for monitoring and evaluation (M&E) agriculture and rural development in less-than-ideal conditions* (GDPRD *et al.*, 2008). This work provides a number of workable approaches for designing an M&E system that would be of greatest relevance to different agricultural and rural development activities, projects and programmes, and degree of data availability. A set of 19 priority indicators have been identified in order to allow international comparisons. The construction of the GDPRD rural development statistical framework was based on three main requirements: comparability, availability and relevance.

Focus on the List of Priority Indicators in Less-than-Ideal Conditions

IV.4 WARNINGS AND SUGGESTIONS ON INDICATORS

IV.4.1 INDICATORS – USE AND MISUSE[6]

The point was made at the outset of this chapter that the word "indicator" implies that reference is being made so something more than a "simple statistic", though the latter can be important to assessing problems of rural areas and of evaluating the performance of policies to alleviate them. In a sense, then, the word "indicator" can have both a generic meaning (referring to quantitative information) and a more specialist technical one.

It is important that all users of official statistics, irrespective of their stand on certain policies and priorities, accept them as authoritative measures of reality, this is particularly important for normative indicators (those official statistics that allow a statement of "better"/"worse", including a quantification of the difference). This is the true meaning of impartiality. This principle is also the reason why official statisticians should avoid policy prescriptive comments when disseminating normative indicators. Normative indicators lend themselves to transformation into rankings or league tables. Opinions differ whether statistical offices, and statistical services of international organizations, should publish rankings, as opposed to a more neutral sequence of tables. Fundamentally, if the indicator is sufficiently robust, and if the data sources are of sufficient quality and comparability, there is nothing that prohibits ranking. Ranking is even used for statistics other than normative indicators, with the purpose of identifying countries or regions that are "outliers" in a certain way and where the ranking deserves further explanation and analysis.

[6]This section is adapted from Brüngger (2004).

Using the term "indicators" in the latter, technical way, an indicator is simply the combination, through a defined algorithm, of two (or more) statistical results ("numbers") to form a new derived measure. Such an indicator may or may not lend themselves to a normative interpretation. The simplest form of algorithm is through a numerator and denominator, e.g. as per capita ratios or percentages or other forms of shares. The two elements may be taken from the same statistics (e.g. as for growth rates), or from two different statistics. The added element of the derived measure, as compared to simply looking at the numerator and denominator separately, is the added degree of comparability; the derived measure eliminates the size effect of the denominator. This is an especially desirable property when comparing across regions or between countries, but it is also important for comparisons over time in economic statistics. With this wide characterization of an indicator, all comparisons over time based on simple indices (with a base period value as denominator) would be included under this concept. There are more elaborate forms of algorithms to compile derived measures in official statistics, which try to eliminate effects other than size. Examples are age standardisation, constant price aggregates, or seasonal adjustments.

The so-called **synthetic indicators** take the algorithms to a far higher level of complexity and require special care in their use and interpretation. These are composite measures of individual indicators designed to give an easy overview of a complex array of indicators or statistics. Different forms and techniques of "weighting" the individual series are used[7]. The need for weighting arises from the fact that either the components are not expressed in the same measurement unit, or refer to different items where there is no obvious method of aggregation (such as prices for different commodities). While there has been some discussion about synthetic indicators in meetings of official statistics, the issue of whether, or under what conditions, such indicators are compatible with the framework of official statistics has not been given much attention.

Price and volume indices are prime examples of synthetic indicators that are widely used in official statistics. If the single components are themselves produced according to the framework of official statistics, the added step of synthesizing them through empirical weighting derived from official statistics is also within this frame, and can add considerable value to the results. The essential character of such indices that make them acceptable is that economic theory has something to say about the correct way of aggregating.

The issue is rather different with synthetic indicators where theory has no (or little) guidance to offer and where aggregation is based on subjective weights, be they determined by policymakers, specific users, or based on expert opinions about importance. Many statisticians argue that such subjective weights are not compatible with the principle of impartiality. According to this view, official statisticians should not publish such synthetic indicators under the guise of official statistics, even when the individual components are fully part of those official statistics. Aggregating with no assignation of weights is tantamount to giving equal weights to every component, but this equal weighting remains subjective unless it has an empirical or conceptual

[7]An obvious example is found in the annual **Human Development Reports** (HDR), which was first launched in 1990. Since the first Report, four new composite indices for human development have been developed — the Human Development Index, the Gender-related Development Index, the Gender Empowerment Measure, and the Human Poverty Index (Source: http://hdr.undp.org/aboutus/).

foundation. Subjective weighting is especially problematic for international comparisons, because different countries may prefer different weighting schemes, and it is hard to see ways in which an agreement between countries on subjective weights may be reached. In practice, the "experts" from the secretariats of international organizations will impose their own subjective weights[8].

It is recommended that official statisticians withstand pressures for endorsing synthetic indicators based on subjective weights, and make the components visible. If they are used, the limits of aggregation that are permitted within official statistics have to be made absolutely clear.

IV.4.2 SYNTHETIC INDICATORS: PROS AND CONS

Synthetic indicators, with some components being subjective, have become very popular outside official statistics, such as for comparing countries on corruption, competitiveness etc. Before official statisticians embark on the same approach serious consideration has to be done on their relative advantages and disadvantages and caution exercised about the possible loss of impartiality that may be implied.

As stated above, a synthetic or composite indicator is created when individual indicators (or variables) are compiled into a single index on the basis of an underlying model of the multi-dimensional concept that is being measured (e.g. development, poverty, wellbeing, quality of life, etc.). They are used when individual indicators cannot adequately capture such multi-dimensional concepts. Ideally, a composite indicator should be based on a theoretical framework which allows single indicators or variables to be selected, combined and weighted in a manner which reflects the dimensions or structure of the phenomena being measured.

Operationally, the steps for constructing a composite indicator can be summarized as follows:

1) **Defining the phenomenon** to measure. The definition of the concept should give a clear sense of what is being measured by the composite indicator. It should refer to a theoretical framework, linking various sub-groups and underlying indicators.
2) **Selecting a group of primary indicators**, usually expressed in different units of measurement. The strengths and weaknesses of a composite indicator reflect the quality of the underlying primary indicators. Ideally, indicators should be selected according to their relevance, analytical soundness, timeliness, accessibility etc. Proxy measures can be used when the desired data are unavailable or when cross-country comparability is limited.

[8]A good example of this issue is Transparency International's (TI's) annual "Global Corruption Reports", which contains a number of Corruption Surveys and Indices: The TI Corruption Perceptions Index (CPI) ranks countries in terms of experts' perception of corruption; the Global Corruption Barometer is a survey that assesses general public attitudes towards, and experience of, corruption in dozens of countries around the world; and The TI Bribe Payers Survey evaluates the supply side of corruption - the propensity of firms from industrialized countries to use bribes in foreign countries. (http://www.transparency.org/about_ti/annual_rep/index.html).

3) **Normalising primary indicators** to make them comparable. **Normalisation** is required prior to any data aggregation as the indicators in a data set often have different measurement units. Therefore, it is necessary to bring the indicators to the same standard, by transforming them into pure, dimensionless, numbers. There are various methods of normalisation, such as ranking, re-scaling, standardisation (or z-score) and "distance" to a reference. Assigning the same "importance" to each indicator, it is indispensable to apply a transformation criterion that makes the indicators independent from both the unit of measure and from the variability, e.g. the standardisation (Mazziotta and Pareto, 2010b).

4) **Aggregating and weighting** the normalised indicators by composite indices (mathematical functions). Different aggregation methods are possible. The most used are additive methods that range from summing unit rankings in each indicator to aggregating weighted transformations of the original indicators. Nevertheless, additive aggregations imply requirements and properties which are often not desirable or are difficult to meet. For example, they assume a full substitutability among the components of the index: a deficit in one dimension can be offset (compensated) by a surplus in another (e.g. in a quality of life index, economic growth may offset environmental destruction). To overcome these difficulties, many solutions have been proposed, e.g. multiplicative aggregations like the geometric mean or non linear aggregations like the Multi-Criteria Approach (Munda and Nardo, 2005) and the MPI[9] (De Muro *et al.*, 2009).

The main pros and cons of using composite indicators are as follows (OECD, 2008):

Pros of composite indicators:

- summarise complex or multi-dimensional realities;
- are easier to interpret than a battery of many separate indicators;
- facilitate the tasks of ranking countries on complex issues and comparing their progress over time;
- place issues of countries' performances at the centre of the policy arena;
- facilitate communication with general public and promote accountability.

Cons of composite indicators:

- may send misleading policy messages, if poorly constructed or misinterpreted;
- may invite simplistic policy conclusions, if not used in combination with the individual indicators;
- may be misused, if the construction process is lacking and/or not transparent;
- may be the subject of political dispute;
- may disguise serious failings in some dimensions and lead to inappropriate policies.

[9]The MPI (Mazziotta-Pareto Index) is a non-compensatory composite index which, starting from a linear aggregation, introduces "penalties" for the statistical units with "unbalanced" values of the indicators. The MPI is based on the property of "non-substitutability" of indicators and can be applied to different scientific contexts, since it is independent from the "sign" (polarity) and the range of the individual indicators (Mazziotta and Pareto, 2010).

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Focus on the Aggregation Problem[1]

The construction of published statistical data is a long and complex process involving institutional and theoretical constraints, although this is not sufficiently explained to the public. In this process *aggregation* is one of the most sensitive stages, but it is often overlooked. The process of aggregation should not be underestimated because it could lead to misinterpretations and consequently to wrong interventions by policies.

Aggregation is currently an issue in the literature because of the needs of supranational institutions such as central banks and economic and political integrated groupings (such as, for example, the European Union) to manage economic policy across the complete territory. In such contexts, the availability and accuracy of data become strategic and decisive.

In statistical and econometric literature the term "aggregation" has been treated to various interpretations. It is possible to identify the following three aspects:

- *longitudinal or spatial aggregation*, which concerns aggregation across geographic space (usually Regions or lower administrative areas) or a combination of physical and institutional units (households, businesses and institutional sectors), or productive sectors
- *temporal aggregation*, that concerns moving from higher frequency data (e.g. quarterly) to a lower one (typically annual)
- *contemporal aggregation*, in which the aggregation is done across variables (e.g. the construction of a composite index such as the HDI - Human Development Index, created in 1990 for the purposes of the United Nations Development Programme), or between different prediction models (e.g. the combining or pooling forecasting).

Several theoretical approaches have stressed the need of non-contradiction between micro and macro linear relations, and more generally have discussed the degree of consistency in aggregation. Some scholars developed statistical tests that would identify the conditions for perfect aggregation, while empirical studies are now more concerned about which level of aggregation is optimal for analysis.

There are several reasons in favour of working with highly aggregated data. The most significant ones are:

- in some cases the choice between aggregated and disaggregated data is constrained by their availability (often, only aggregate data are available);
- simplicity and parsimony; a few numbers are very effective in summarizing complex issues in a simple and understandable way to public opinion and policy-makers;
- statistical processing is faster and clearer; this is a key factor when the data have to be released at fixed deadlines;
- to work on macro variables can be a practical solution if the micro-data are taken from incomplete or unreliable statistical sources;
- macro-data can, in some cases, solve problems of systematic error in micro-data, as well as reducing their impact on model specification;

[1] Section contributed by E. Pizzoli and G. Lutero. The Appendix is by G. Lutero.

- the collection and processing of new micro-data from statistical surveys is very expensive and poses a further constraint to their availability (it is therefore necessary to properly evaluate their real contribution in terms of statistical information).

Conversely, working with disaggregated models and micro-data has the following advantages:

- completeness of information; all information content of the source data is preserved and data reduction (aggregation) is just one of several possible choices for the analysis;
- better estimates with respect to macro-models results; greater availability of observations involves more degrees of freedom in data processing and, consequently, the estimates are more efficient, the statistical tests are more powerful, etc.;
- alternative model specifications; the availability of micro-data allows various specifications of the model on micro-units to be considered, depending on the circumstances;
- better forecasts with respect to macro-models estimates; this is a consequence of the increasing accessibility of micro-data and a differentiated, and therefore better, specification at the micro level.

There are two good reasons to face the topic of aggregation with a new approach: the increasing availability of time series data on basic statistical units, and the expansion of fast computing power. The evolution of applied disciplines has led to the discovery of new and more refined econometric methodology (like panel data models or dynamic factorial analysis) that keeps the informative contents of microdata yet, at the same time, identifies an aggregated parameter estimate representative of macroeconomic behaviours.

Often the applied research is focused on the identification of best linear predictors for aggregates, checking whether there are more efficient forecasts from aggregated variables or the aggregation of forecasts from individual micro equations. What influences the accuracy of predictions should be also considered because, unfortunately, several factors could be sources of statistical bias. They can be synthesized in the following groups:

- model specification identification of variables to include;
  - functional form (linear aggregation versus nonlinear);
  - model selection criteria;
- estimation uncertainty;
- data measurement errors;
- structural breaks over forecast horizon.
- The statistical and econometric procedures (parametric and non-parametric) available to face the issue of aggregation may be classified as follows:
- regression model-based stochastic framework:
  - static univariate models (cross-sectional data);
  - dynamic models (time indexed, e.g. typically ARIMA models or OECD's Composite leading indicators);
  - multivariate (factor models) or panel models;
- non regression model-based deterministic framework (composite indicators).

The aggregation bias in linear static or dynamic aggregated stochastic models could be determined by:

- micro parameters values;
- mis-specification of equations (omitted variables in micro models or, conversely, models over-parametrization);
- measurements errors;
- mis-classification errors;
- dynamic interrelation between behavioural structural micro equations.

A choice between macrodata and microdata and then between aggregated or disaggregated data or procedures cannot be resolved by *a priori* reasoning. An empirical solution can be found in the context of particular applications, because several factors could be sources of bias (estimation uncertainty, models' mis-specification to several level of aggregation, endogenous dynamic relation between predictors). The main alternative available for public opinion and policy-makers seems to be information loss *versus* readability.

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Focus on the Aggregation Problem

Appendix A

Longitudinal aggregation

For the sake of simplicity, theory will be exclusively illustrated in relation to univariate linear models and finite sample. Following Theil (1954), let us consider the disaggregated model relative to a single micro-unit *i* (e.g. country, industry, household) at time *t*

$$y_{it} = x_{it}^{'}\beta_i + u_{it} \quad i = 1,...,n \quad t = 1,...T \tag{1.1}$$

where y_t is the dependent variable relative to unit i at time t, $x_{it} = (x_{1it},...,x_{kit})$ is a vector of *k* exogenous regressors, β_i is the vector of coefficient for *i-th* section and u_{it} is a stochastic error with the usual hypothesis (mean equal zero and variance σ_i^2). Assuming linear additive aggregation, let us define equation relative to aggregated data

$$y_{at} = \sum_{i=1}^{n} y_{it} = x_{at}\beta_a + u_{at}$$

To identify the statistical correspondence between micro equations and macro equation disturbances, Theil adopts a set of auxiliary relations, computing projections of micro model predictor variables on the corresponding of aggregated ones

$$x_{it}^{'} = Z_{rt}\delta_i + \varepsilon_{it} \tag{1.2}$$

where matrix $Z_{rt} = diag(x_{1at}, x_{2at},..., x_{kat})$ and ε_{it} auxiliary regression shocks. Finally, substituting equation (1.2) in structural micro equation (1.1) and summing across units, estimated aggregate disturbances is the sum of two magnitudes, respectively the *aggregation bias* and the sampling disturbances

$$\hat{u}_{at} = \sum_{i=1}^{n} \hat{u}_{it} = \sum_{i=1}^{n} (\varepsilon_{it}^{'}\hat{\beta}_i + \hat{u}_{it}) \tag{1.3}$$

Hence variance of aggregate error is the following

$$\hat{\sigma}_a^2 = n^{-1}(\sum_{t=1}^{T} \varepsilon_{it}^{'}\hat{\beta}_i)^2 + \sum_{i=1}^{n} \hat{\sigma}_i^2 + \sum_{j \neq i} \sigma_{ij} \tag{1.4}$$

From this last relation is verified that variance of aggregation bias can be computed as a weighted mean, whose weights are represented by estimated squared micro coefficients.
The very good article of Pesaran, Pierse and Kumar (1989) resume state-of-the-art on static linear aggregation and proposes a more general misspecification test, comparing differences between the average of estimated micro coefficients and aggregated estimate. Null hypothesis of perfect aggregation is the following

$$\xi = \sum_{i=1}^{n} X_i \beta_i - X_a b = 0$$

If $\xi > 0$, the authors stress that this statistic test might be taken as measure of misspecification in micro equations.

Lippi and Forni (1990) expand the investigation to dynamic models specification and showed that adopting an ARMAX framework for micro equations as follows

$$\phi(L) y_{it} = \gamma(L) x_{it} + \theta(L) \varepsilon_{it}$$

with usual stochastic assumptions and no common polynomial factors, it is possible to improve the study of individual heterogeneity, providing for relations between the dynamic structure of several micro equations, represented by polynomials in the lag operator $\phi(L), \gamma(L), \theta(L)$. Besides they stress that dynamic shape is altered in the passage from micro to macro equations (*dynamization effects* of aggregation[2]) and, although aggregated model might possess much richer dynamic specification, well-specified disaggregated models give in general better outcomes.

Lippi e Forni adopted Factor analysis[3] to determine aggregation error linked to microdata. Let us suppose that explanatory variables are collected in matrix $X_t = \left(x_{1t}, x_{2t}, ..., x_{nt} \right)$, and it may be split in two distinct, orthogonal processes

$$X_t = WC_t + h_t \qquad \textbf{(1.5)}$$

where $C_t = (c_t, c_t, ..., c_t)$ is a matrix of non-observable common factors, $h_t = (h_{1t}, h_{2t}, ..., h_{nt})$ is a matrix of idiosyncratic components and $W = \left(W_1, W_2, ..., W_n \right)$ is a matrix of static loadings coefficients: unobserved common movements along time, the latent factors, are extracted from observed aggregated data and residual magnitude is regarded as the individual specific shock. Micro model expressed in factor analysis approach is the following

$$y_{it} = (W_i c_t + h_{it})' \hat{\beta}_i + \hat{u}_{it} \qquad \textbf{(1.6)}$$

Substituting and summing across units, aggregated model will be

[2]These dynamization effects may arise from errors in the set of available variables, from temporal aggregation, from omission of relevant variables and finally from adoption of linear framework to interpret nonlinear relationships.

[3]Factor analysis representation has been introduced in time series by Lucas (1973), Sargent and Sims (1977) and Geweke (1977). See also Forni and Lippi (1997) (chap. 1) for an introduction to this approach.

$$y_{at} = \sum_{i=1}^{n} y_{it} = \sum_{i=1}^{n} (W_i c_t)' + \sum_{i=1}^{n} h_{it} \hat{\beta}_i + \sum_{i=1}^{n} \hat{u}_{it} \quad \textbf{(1.7)}$$

Similarly to equation (1.3), estimated aggregate error is a mixture of aggregation bias and misspecification errors in microdata

$$\hat{u}_{at} = \sum_{i=1}^{n} \hat{u}_{it} = \sum_{i=1}^{n} \left(h_{it} \hat{\beta}_i + \hat{u}_{it} \right) \quad \textbf{(1.8)}$$

Estimated variance of aggregated factor model is

$$\hat{\sigma}_a^2 = n^{-1} (\sum_{t=1}^{T} h_{it}' \hat{\beta}_i)^2 + \sum_{i=1}^{n} \hat{\sigma}_i^2 + \sum_{j \neq i} \sigma_{ij} \quad \textbf{(1.9)}$$

In factorial formulation aggregation bias is directly expressed by idiosyncratic components: Theil's conditions of compositional stability results from the absence of micro individual heterogeneity that involves the vanish of first term in equation (1.9) as for micro homogeneity case.

Afterwards Forni and Lippi (2001) proposed a generalization of factor models, introducing a dynamic relation between variables and unobserved common component and relaxing the condition of orthogonality for idiosyncratic components. For every unit, it will have the following relation

$$y_{it} = b_{i1}(L) c_{1t} + b_{i2}(L) c_{2t} + ... + b_{iq}(L) c_{qt} + h_{it}$$

To estimate common movements are available several methodologies: static principal component, dynamic principal component and structural state-space approach.

Appendix B

Temporal aggregation

Let us define a stationary stochastic process y_t at time frequency t. High frequency data are available at aggregation frequency k (e.g. *k*=4 implies quarterly data, *k*=12 monthly data). To obtain low-frequency series is applied a linear transformation to high frequency data, represented by polynomial function A(L)=$(1+L+L^2+\ldots+L^{k-1})$, where L is lag operator such that $y_{t-k}=L^k y_t$

$$y_{lt}=A(L)y_t=\sum_{i=0}^{k-1}\omega_i y_{t-i}$$

Let us start with most common stochastic process, the autoregressive AR(p), of order p

$$\phi(L)y_t=\xi_t \qquad \textbf{(2.1)}$$

Applying to AR(p) model the polynomial A(L), which transforms high-frequency data to low-frequency ones

$$A(L)\phi(L)y_t=A(L)\xi_t \qquad \textbf{(2.2)}$$

the resulting model will be an ARMA(p,s), where order s is represented by the following ratio

$$s=\left[\frac{(p+1)(k-1)}{k}\right]$$

in which square brackets identifies the integer part of the ratio. The solution descends from a nonlinear system of equations, taking into account the autocovariance structure of the MA polynomial.

As well, the same transformation operated on Autoregressive Moving Average ARMA (*p*,*q*) model

$$\phi(L)y_t=\theta(L)\xi_t \qquad \textbf{(2.3)}$$

leads to an ARMA(p,s), in which magnitude s is equal to

$$s=\left[\frac{(p+1)(k-1)+q}{k}\right]$$

If we also considered non-stationary processes, it could be introduced the Integrated Autoregressive Moving Average ARIMA (*p*,*d*,*q*), could be introduced, where parameter d is the order of integration

$$(1-L)^d\phi(L)y_t=\theta(L)\xi_t \qquad \textbf{(2.4)}$$

In this case aggregation involves the switch of the original model in ARIMA (*p*,*d*,*s*), and the following value of parameter *s*

$$s = \left[\frac{p(k-1) + (d+1)(k-1) + q}{k} \right]$$

Focus on OECD Indicator Requirements

As part of its Statistics Strategy, the OECD has developed a Statistical Quality Framework for OECD Statistical Activities[1]. This Framework has four elements:

- a definition of quality and its dimensions;
- a procedure for assuring the quality of proposed new statistical activities;
- a procedure for evaluating the quality of existing statistical activities on a regular basis;
- a set of broad principles on which OECD statistical activities are to be conducted and quality guidelines covering all phases of the statistical production process.

Quality is defined as "fitness for use" in terms of user needs. This definition is broader than has been the custom in the past, when quality was equated with accuracy. Even if data are accurate, they cannot be said to be of good quality if they are produced too late to be useful, or cannot be easily accessed, or appear to conflict with other data. Thus, quality is viewed as a multi-faceted concept.

The OECD has adapted for its own use dimensions of quality previously identified by other statistical organisations. Thus, the OECD views quality in terms of seven dimensions:

- relevance;
- accuracy;
- credibility;
- timeliness;
- accessibility;
- interpretability; and
- coherence.

Another factor is that of cost-efficiency which, though not strictly speaking a quality dimension, is still an important consideration in the possible application of one or more of the seven dimensions cited previously.

These criteria are in turn adapted to specific domains. Two of these are of particular relevance to this Handbook.

Statistics for rural development policy

A key challenge for policy makers is to identify indicators that are capable of describing the impacts of policies where cause and effect are not always identifiable and where results may appear only in the medium to long run (OECD, 2006). The traditional challenges for identifying indicators for monitoring and evaluation are exacerbated by the multi-sectoral nature of rural development policies. For example, indicators are often measured to establish a causality between actions taken and the observed change

[1] http://www.oecd.org/document/43/0,3343,en_2649_33715_21571947_1_1_1_1,00.html

or lack of change. Each rural place has its own unique characteristics, and for this reason applying statistical measures might be particularly difficult. Often case studies are used to evaluate rural development policy, either to analyse the same place before and after a "treatment" (longitudinal) or to analyse two different places at the same point in time, one that received "treatment" and one that did not (cross-sectional). Given the multitude of variables in rural development, such attempts at establishing causality are questionable. The lack of sufficient theoretical models to understand exactly how and why regional development occurs further complicates such analyses (OECD, 2006).

Good indicators must therefore meet several requirements. They should be unambiguous measures of strengths or weaknesses of an area that are available across all units or regions being observed in a timely fashion and in a time series. The indicators must be complete with regard to the issues being evaluated. The quality of the data must be uncontroversial and reliable. A specific challenge for rural development policy, with the split of knowledge and incentives among levels, is the trust by all actors in the data source and the method of data collection. This trust is particularly important when results are being used for a form of sanction or reward (OECD, 2006).

Therefore, the OECD has formulated the following requirements on rural indicators:

- **Communication**: OECD rural indicators shall enable Member countries to better communicate and discuss their national rural development problems and prospects.
- **Comparison**: OECD rural indicators shall facilitate the identification among Member countries, of similarities and differences in rural development based on comparable statistics, so that a fruitful exchange of views and experience is possible.
- **Co-operation**: OECD rural indicators may even encourage Member countries to co-operate in the design and assessment of their rural development strategies.

The Project on Rural Indicators provides information on sub-national (rural) areas in a multi-national (OECD) context. It aims to establish a consistent information basis for systematic general description as well as for cross-national analysis of rural conditions and trends, which form the background for the design, implementation and impact of rural policies in OECD Member countries.

OECD indicators should not be considered as imposing uniform concepts at the national level but rather as helping to provide a common language that allows international communication of similarities and differences. To meet this task:

- The statistics on which the calculation of indicators is based must be harmonized and comparable to the degree needed to make international communication meaningful.
- The results generated from these sources should be sufficiently differentiated and specific to the degree that they adequately reflect the whole range of territorial variety and distinctiveness.

From the above considerations the OECD derived three basic principles, which are important for any attempt to develop and operationalise a set of indicators:

- **Relevance**: To be relevant, indicators must serve a **clearly defined purpose**. Thus, the analytical and/or policy objectives for developing and using the indicators should be specified. Consideration of the relevance of indicators always implies an identification of their potential uses. For those indicators that are designed to shape, implement or monitor policies, relevance also implies taking into account the administrative context, whether (inter-)national, regional or local, in which they can usefully be interpreted.
- **Reliability**: To be reliable, indicators must have **a sound scientific basis**. The reliability of indicators and their underlying analytical concepts depends on the quality of the theoretical foundations or models on which they are based: Validity of measurement must be ensured. As far as possible, the explanatory power of the indicator should be intuitive to potential users and not only to trained specialists in the field. This is more likely to be achieved if the measurement is as direct and close as possible to the observed phenomenon:
- **Realisability**: To be realisable, indicators must **be built on available statistical data**. Availability depends on the degree to which the analytical concept can be operationalised, on the type of data source, and on the possibility of assembling data within reasonable limits of time and resources. Realisability thus focuses on the producers of indicators and on the feasibility of data collection and processing (OECD, 1996).

Environmental indicators

In some countries, principally the Member States of the EU, rural development policy embraces issues such as biodiversity and the appearance of the countryside. Agriculture and forestry are used instrumentally to achieve environmental objectives. It is therefore appropriate to give brief consideration to the requirements that the OECD has established for environmental indicators.

In developing environmental indicators, the OECD identified three basic criteria for selecting indicators and validating their choice: **policy relevance and utility** for users, **analytical soundness,** and **measurability.**

In terms of policy relevance and utility for users, an environmental indicator should:

- Provide a representative picture of environmental conditions, pressures on the environment or society's responses;
- be simple, easy to interpret and able to show trends over time;
- be responsive to changes in the environment and related human activities;
- provide a basis for international comparisons;
- be either national in scope or applicable to regional environmental issues of national significance;
- have a threshold or reference value against which to compare it, so that users can assess the significance of the values associated with it.

In terms of analytical soundness, an environmental indicator should:

- be theoretically well founded in technical and scientific terms;

- be based on international standards and international consensus about its validity;
- lend itself to being linked to economic models, forecasting and information systems.

In terms of measurability, the data required to support the indicator should be:

- readily available or made available at a reasonable cost/benefit ratio;
- adequately documented and of known quality;
- updated at regular intervals in accordance with reliable procedures.

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Focus on European Union Indicator Requirements and their Assessment

In the PAIS report a set of criteria very similar to that of the OECD is used for assessing indicators. It can be summarized as follows:

- Sensitivity: An indicator should be able to respond to a broad range of conditions within an appropriate time scale and geographic scale.
- Analytical Soundness: An indicator should be based on sound scientific methods.
- Comprehensibility: An indicator should be in a format that the target audience can understand; for example it should be non-technical if the target audience is the general public.
- Relevance: The indicator should be relevant to the desired goal, issues or mission. This is particularly the case for policy related indicators. For descriptive indicators the indicator is assessed in the particular light of the rural development issue to be addressed.
- Reference value: The indicator should have a guidance level or benchmark against which to measure change over time.
- Generality: The applicability of the indicator to the European level.
- Data availability: Indication of the availability of the data at the European level.
- Conceptual Requirements: Indication of how the conceptual basis of the indicator may need to be developed (Bryden, 2001).

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- Relevance: The indicator should be relevant to the desired goal, issues or mission. This is particularly the case for policy related indicators. For descriptive indicators the indicator is assessed in the particular light of the rural development issue to be addressed.
- Reference value: The indicator should have a guidance level or benchmark against which to measure change over time.
- Generality: The applicability of the indicator to the European level.
- Data availability: Indication of the availability of the data at the European level.
- Conceptual Requirements: Indication of how the conceptual basis of the indicator may need to be developed (Bryden, 2001).

FOCUS PIECES

Bryden, J. (2001). *Section 3: Rural Development*. In *Landsis g.e.i.e. Proposal on Agri-Environmental Indicators PAIS*. Luxembourg, 2001.

Focus on the Selection of Rural Indicators

By and large the sets of themes within rural development statistics proposed by international organisations resemble each other. It may be helpful to consider the choice of such indicators in generic terms. The observation of rurality can be done from several perspectives, suggested by different theories of development. The corresponding themes of interest could be utilized for the construction of rural indicators. Below examples of indicators are given for various themes within the two schemes.

Scheme I

Here the focus is on the components of rural development. The suggested indicators are as follows.

A. Components of rural development

1. Natural environment
2. Social well-being
3. Conditions for economic well-being

B. Potential of rural development

1. Territory with respect to population
2. Economic structure
3. Communications

C. Special focuses on developing countries

Scheme II

In this second scheme the focus is on the development process. The discussion on indicators of development starts from a framework for understanding "sustainable livelihoods" as suggested by the UK's Department for International Development (DFID) in the report: Introduction to the Sustainable Livelihoods Approach[1] (www.livelihoods.org/info/info_guidancesheets.html). DFID defines livelihood as the combination of "the capabilities, assets and activities required for a means of living". Within this livelihood context the core analytical framework starts from the so-called **asset pentagon**, which contains the following five categories:

1. Natural capital;
2. Financial capital;
3. Human capital;
4. Physical capital; and
5. Social capital**.**

Communities and regions achieve desired outcomes by applying strategies that exploit these assets. Indicators or statistics on strategies are difficult to conceptualize and,

[1]DIFD is a British government department responsible for promoting development and the reducing poverty.

typically, the strategy that works for one community or region will not be appropriate for another. However, some indicators or statistics will be proposed that measure:

6. **The capacity of the community / region to generate and to implement strategies.**

Finally, **Indicators of Desired outcomes** would need to be monitored.

It quickly becomes obvious that there are no hard-and-fast rules for assigning a given indicator to a given category. Rather, the purpose of these categories is to remind us that these five assets are important in the development process of urban and rural communities and regions.

A list of examples of indicators relating to these two schemes appears below.

Scheme 1

A. Components of rural development

A.1) Natural environment

Character: *Quality of the countryside and the condition of the natural environment (natural resources and wildlife), as necessary requirements to reach a good quality of life and as an opportunity to enhance the economic conditions of the rural population.*

Suggested proxy indicators:

1. State

Per capita drinking water: cubic metres of drinkable water at time *t* / population at time *t*

Per capita CO_2 emission: tonnes of CO_2 emission at time *t* / population at time *t*

Per capita energy consumption: KWh of energy consumption at time *t* / population at time *t*

Biodiversity index: number of animals (farmland birds, wild beasts, farm animals) at time *t* / square kilometres of the surface at time *t*

Landscape index: square kilometres of land lost from agriculture and forestry to industrial, housing, road and other uses at time *t* / square kilometres of the surface at time *t*

Waste recycling index: percent of waste that is recycled at time *t*

2. Tendency over time

For each indicator: indicator at time *t* / indicator at time *t-1*

A.2) Social well-being

Character: Quality of social life and welfare. Good quality means good education and health; reduced risks and vulnerability of people.

Suggested proxy indicators:

1. State

Literacy rate: percent of population, aged 15 – 24, who have completed a given level of formal schooling at time *t*

Infant mortality rate: number of deaths of infants (under one year of age) per 1,000 live births at time *t*

Newspapers per capita: number of newspapers sold at time *t* / population at time *t*

Political rights: percent of the eligible voters who voted in the last election

Green areas rate: green area as a percent of total area at time *t*

2. Tendency over time

For each indicator: indicator at time *t* / indicator at time *t-1*

A.3) Conditions for economic well-being

Character: Income and wealth of people.

Suggested proxy indicators:

1. State

Real per capita income: real income at time *t* / population at time *t*

2. Tendency

Real per capita income growth: real per capita income at time *t* / real per capita income at time *t-1*

3. Dispersion and concentration

Real per capita income inequality: normalised squared error from the mean at time *t*
Gini Index of Inequality at time *t*

B. Potential of rural development

B.1) Territory with respect to population

Character: territory available to the rural population to live, to cultivate (usable agricultural land) and to perform other economic activities.

Suggested proxy indicators:

1. State

Per capita territory: square kilometres of the surface at time *t* / population at time *t* (which is the inverse of the population density)

Per capita AAU: Agricultural Area Utilised (AAU) (square kilometres) by rural population at time *t* / rural population at time *t*

Rural youth: rural population under 14 at time *t* / rural population at time *t*

2. Dispersion

Per capita territory: Number of rural territorial units within each size class of square kilometres of surface area per inhabitant at time *t*

Per capita AAU: Number of rural territorial units within each size class of AAU at time *t*

3. Tendency over time

Rural pop. growth: rural population at time *t* / rural population at time *t-1*

B.2) Economic structure

Character: Health of the economic environment of the rural population.

Suggested proxy indicators:

1. State

Employment rate: population employed at time *t* / population at time *t*

Local government debt rate: local government debt in region *r* at time *t* / population in region *r* at time *t*

2. Tendency over time

Migration rate: percent net flow of population at time *t*

Employment growth rate: population employed at time *t* / population employed at time *t-1*

Local government debt reduction: local government debt in region *r* at time *t* / local government debt in region *r* at time *t-1*

B.3) Communications

Character: Ability of rural population to communicate and interact with the rest of the world.

Suggested proxy indicators:

1. State

Per capita stations: number of stations (railway stations, ports and airports) at time *t* / rural population at time *t*

Per capita telephones: number of telephones (home, mobile and public) available at time *t* / population at time *t*

2. Tendency over time

Per capita stations rate of growth: number of stations at time *t*/ number of stations at time *t-1*

Per capita telephones rate of growth: number of telephones at time *t* / number of telephones at time *t-1*

C. Special focus on developing countries

This is a list of characters that are relevant from a developing country perspective. The construction of indicators is not suggested as the final choice will depend mainly on data availability in any country.

C.1) Market and institutions

- food price index
- membership in organisations of agricultural producers

C.2) Infrastructure

- rural population with access to electricity

C.3) Poverty

- rural population living on less than $1 a day
- rural child malnutrition

C.4) Agriculture

- agricultural productivity
- food production index

C.5) Natural resource

- forests and deforestation

C.6) Education

- rural female literacy with respect to rural male literacy
- net rural enrolment ratio in primary education

C.7) Health

- infection among rural population

Scheme 2

ASSETS, CAPACITY to design and implement strategies and desired OUTCOMES for sustainable livelihoods

Selected possible indicators for urban and rural populations	One possible rural-specific indicator for this item
*Potential indicators of the **ASSETS** of a locality or region are:*	
Natural Capital	
Potential drinkable water per capita, within a given time period	How much time per day is required to access and transport water for an average family?
Hectares of arable land per capita	
Hectares of forested land per capita	
Financial Capital	
Share of population with savings over a given limit (say, with savings greater than one-half of the individual's annual income)	What share of these "savings" is in fixed assets (e.g. land, buildings, machinery) and what share is in liquid assets (e.g. stocks, bonds, bank accounts)?
Availability of financial institutions (banks, lending circles, etc.) within the community / region (e.g. number of institutions or distance to the nearest institution)	Is the institution required to re-invest a certain share of its portfolio in the local community?
Physical Capital	
Percent of population living in a household with electricity	For persons without electricity, what share has no access to electrical services?
Housing stock (number of persons per room in the dwelling)	
Percent of population within one kilometre of a paved road	
Percent of population within one hour of an international airport	
Human Capital	
Infant mortality rate: number of deaths of children under one year of age as a percent of all live births within a given the time period	For infants who die, what percent die due to a lack of access to maternal care?
Percent of population, for a given age group, who are literate (For some countries, the OECD Adult Literacy Survey is appropriate. Alternatively, one might tabulate the share of the population, within a given age group, who have completed a given number of years of formal schooling.)	
Percent of children, within a given age group, enrolled in formal schooling	For each age group, percent of population living more than 30 minutes from a school.
Percent of population living more than one hour (or one-half hour) from a hospital	
Social Capital	
Number of newspapers sold per capita, within a given time period	Share of news that is local, national and international
Percent of eligible electors who voted in a recent election	
Percent of individuals living in a residence with a telephone (land line or cell phone)	

Percent of individuals of a given age group who participate in a voluntary organization or community groups	
*Potential indicators of the **CAPACITY** to design and implement development strategies would include:*	
Percent of the population, for a given age group, who have attained a secondary school diploma;	For population 20 to 24 years of age without a secondary school diploma, percent who live more than 30 minutes from a secondary school
Percent of population working in, or with experience in, each of the industrial sectors of the economy (such as agriculture, manufacturing, tourism, retail sales, etc.)	
Percent of population living within 15 minutes of public transport (bus, train, boat, etc.)	
Number of new business starts in the past 12 months, calculated on a per capita basis	Percent of new entrepreneurs who grew up on this locality
*Potential indicators of the **desired OUTCOMES** of the sustainable livelihoods of individuals within urban or rural communities or regions:*	
Life expectancy at birth, for males and females	
Population change, tabulated for specific age groups and by gender (some rural communities / regions wish to stop population decline while other communities / regions wish to stabilize their populations at new, but lower, sustainable population level, while there is another group of rural communities / regions who wish to restrict their population growth from in-migrants);	
Employment rate (percent of individuals in a given age and gender group, who are employed – in wage work or self-employed or as an unpaid family worker);	
Earned income per worker[2] (by age and gender)	
Percent of population living in poverty (using the measure of poverty suitable for each country, to determine urban – rural differences)	
Percent of population, for a given age group, that dies from a preventable cause (e.g., accidents, communicable disease, AIDS, etc.)	

[2]One common indicator for international comparisons is the GDP per capita. This is problematic for sub-national analysis. Many countries do not prepare a sub-national set of national accounts – and most certainly not for rural and urban areas. The ability to correctly assign the earnings of labour and the earnings of capital, let alone the number of workers, to the appropriate sub-national geography is problematic (although admittedly still a popular activity for some). Caution is called upon against placing undue emphasis on the calculation of GDP per capita for sub-national areas.

FOCUS PIECES

Gianfaldoni, V. & Pizzoli, E. (2009). *Social Well-Being, Economic Development and Sustainability in Rural and Urban Areas. A Comparison of Indicators*. Second Wye City Group Meeting Proceedings, ISTAT, Rome (Link to paper).

Focus on EU Rural Development Themes

In the European Union what is commonly known as "rural development policy" takes place as Pillar II of the Common Agricultural Policy. The focus is the contribution that agriculture can make to economic, social and environmental conditions, and this is reflected in the themes on which related statistics are required to provide information. Thus issues such as poverty and the health conditions of the rural population are not covered.

For the purposes of evaluating Rural Development Programmes (under the Rural Development Regulation 1698/2005, coving the period 2007-2013, that enables EU funds to be used to support rural development actions) the Handbook on the Common Monitoring and Evaluation (CME) Framework outlines a number of areas that are to be covered by statistics. The Programmes' documents are required to describe the current situation of the geographical area using quantified data, highlighting strengths and weaknesses, disparities, needs and gaps and potential for rural development on the basis of the baseline indicators and of other relevant additional indicators. This description should concern:

- **The general socio-economic context of the geographical area**: the definition of the rural area according to the OECD definition or, as appropriate, other definitions; the demographic situation including analysis of the age and gender population structure, in and out-migration and problems arising from peri-urban pressures and remoteness; economic drivers, productivity and growth; the labour market including the structure of employment, unemployment and skills levels; general and agricultural/forestry land use and ownership structure, average size of holdings.
- **Performance of the agricultural, forestry and food sectors:** competitiveness of agricultural, forestry and food sectors, including restructuring and modernisation needs; human capital and entrepreneurship; potential for innovation and knowledge transfer; quality and compliance with community standards.
- **Environment and land management:** the handicaps facing farms in areas at risk of abandonment and marginalisation; overall description of biodiversity with focus on that linked to agriculture and forestry, including high nature value farming and forestry systems, the situation with respect to the implementation of the Natura 2000 directives in farm/forestland; water quality and quantity descriptions, the role of agriculture in water use/pollution and implementation of the Nitrates and the Water Framework directives; air pollution and climate change and their link to agriculture: GHG and ammonia emissions and link to different action plans/initiatives taken by the Member State/region to contribute in achieving international targets including the Code of Good Practice to reduce ammonia emissions (Convention on Long Range Transboundary Pollution); bioenergy use; soil quality descriptions (water and wind erosion, organic matter, contamination) and protection, pesticide use, organic farming and animal welfare; extent of protective and protected forest areas, forest areas under high/medium fire risk, annual average change in forest coverage. The above descriptions should be supported by quantified data.

- **Rural economy and quality of life:** structure of the rural economy, barriers to creation of alternative employment opportunities, micro-business formation and tourism; provision of services in rural area, infrastructural needs, cultural heritage and built environment in villages; human potential and local capacity for development including governance.
- **Leader:** the population and territory of the Member States covered by bottom-up integrated rural development strategies (Leader and other national and EU co-financed programmes) during the 2000-2006 programming period.

For a fuller description of the indicators used within the EU see Chapter VI.

FOCUS PIECES

European Commission (2006). *Rural Development 2007-2013. Handbook On Common Monitoring and Evaluation Framework. Guidance document.* European Commission Directorate General for Agriculture and Rural Development, Brussels. http://ec.europa.eu/agriculture/rurdev/eval/guidance/document_en.pdf

Focus on FAO Themes and Set of Indicators

Following the 1979 World Conference on Agrarian Reform and Rural Development (WCARRD) the FAO produced Guidelines on Socio-Economic Indicators for Monitoring and Evaluating Agrarian Reform and Rural Development (1988). The guidelines were the result of extensive collaborative work by UN agencies and countries. The provisional list of indicators was made available to countries for the preparation of their reports on progress in agrarian reform and rural development to the biennial FAO Conferences in 1983 and 1987. The final guidelines were then submitted for comments to the UN agencies through members of the ACC Task Force on Rural Development (1984).

The WCARRD Programme of Action stated that the primary objectives of rural development are the eradication of poverty, hunger and malnutrition. Other contributory objectives include growth with equity, national self-reliance (especially in food), ecological harmony and the conservation of finite resources.

Indicators covering the following goals and areas of concern were selected (see Chapter V for full list):

- Poverty alleviation with equity
- Income/consumption
- Nutrition
- Health
- Education
- Housing
- Access to community services
- Access to land, water and other natural resources
- Access to inputs, markets and services
- Development of non-farm rural activities
- Education, training and extension
- Growth

The primary indicators are grouped according to WCARRD goals and areas of concern. Notable omissions from the list of primary indicators are those related to people's participation, including women's participation, as they had not been fully developed at that time. It was noted that not all primary indicators would be relevant or meaningful to a particular country so that countries would have to choose among them and substitute or supplement then as necessary.

A selection was made from the primary indicators of a smaller number of "core indicators" that were considered crucial for monitoring poverty alleviation, relevant to most countries and feasible from the data collection point of view. The "core indicators" cover the levels of living items, including access to essential social services, as well as other indicators pertinent to rural conditions of life. On these indicators, countries were requested to establish benchmarks and report changes to the FAO Conference.

During the 1990's, the FAO Conference discontinued the requirement of countries to report on the WCARRD indicators on a biennial basis. The focus shifted to reporting on under-nourishment. Countries however continue to use many of the indicators established in the WCARRD framework.

In 2003, the United Nations Economic and Social Council – High-level segment focused on rural development. The Report of the Secretary-General, "Promoting an integrated approach to rural development in developing countries for poverty eradication and sustainable development" (2003) provides detailed analysis of the issues facing developing countries. In particular it highlights the following elements of an integrated approach to rural development:

- Strengthening the rural economy;
- Social development;
- Sustainable use of natural resources and protection of the environment;
- Empowerment of the poor as a strategy for integrated rural development.

In summary the report states: "*Accelerated rural development is essential to achieve the internationally agreed development goals, including the millennium development goals. The present report provides policy recommendations on ways to promote an integrated approach to rural development, encompassing the economic, social and environmental dimensions, with a number of mutually reinforcing policies and programmes that address a broad range of issues related to rural development.*"

The latest work on the rural world (GDPRD *et al.,* 2008) underlines the importance of the construction of a logical framework for the monitoring and evaluation of rural development.

The effort was to create a core set of 19 priority indicators among the 86 ones originally chosen. In preparing the menu, due care has been taken to include indicators covering all sub-sectors of agriculture and rural development and workable even in situation where data availability is less-than-ideal.

This core set comprises:

A. Sector-wide indicators for agriculture and rural development

1. Public spending on agriculture as a percentage of GDP from the agriculture sector
2. Public spending on agricultural input subsidies as a percentage of total public spending on agriculture
3. Percentage of underweight children under-5 years of age in rural areas
4. Food production index
5. Annual growth in agricultural value added
6. Rural poor as a proportion of the total poor population

B. Specific indicators for sub-sectors of agriculture and rural development

7. Change in yields of major crops

8. Annual growth in value added in the livestock sector
9. Capture fish production as a percentage of fish stock
10. Proportion of land area covered by forest
11. Percentage of the rural population using financial services of formal banking institutions
12. Public investments in agricultural research as a percentage of GDP for the agricultural sector
13. Irrigated land as a percentage of crop land
14. Change in sales/turnovers of agro-enterprises

C. Indicators for thematic areas related to agriculture and rural development

15. Percentage of farmers who are members of community/producer organizations
16. Withdrawal of water for agricultural as a percentage of total fresh water withdrawal
17. Proportion of land area formally established as protected area
18. Change in soil loss from watersheds
19. Percentage of land area for which there is a legally recognized form of land tenure

FOCUS PIECES

FAO (1988). *World Conference on Agrarian Reform and Rural Development: Guidelines on socio-economic indicators.* FAO, Rome.

GDPRD, FAO & World Bank (2008). *Tracking results in agriculture and rural development in less-than-ideal condition. A sourcebook of indicators for monitoring and evaluation*. FAO, Rome.

UN (2003). *Promoting an integrated approach to rural development in developing countries for poverty eradication and sustainable development.* Report of the Secretary-General. 02/04/2003. http://daccessdds.un.org/doc/UNDOC/GEN/N03/307/72/PDF/N0330772.pdf?OpenElement

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FOCUS PIECES

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Focus on the List of Indicators from the Global Strategy (2011)

The Global Strategy to Improve Agricultural and Rural Statistics is based on input from a large number of stakeholders including national statistical institutes and ministries of agriculture, plus regional and international organizations. One of the outcomes of the Fourth International Conference on Agricultural Statistics (ICAS IV) was that there was not only a lack of direction regarding agricultural data requirements posed by the Millennium Development Goals and other emerging issues such as the use of food for bio fuels, the environment and food security, but that these were accompanied by a general decline in the overall quality and availability of agricultural statistics.

These concerns were discussed at a meeting of interested parties during the 2008 meeting of the UN Statistical Commission. This led to a working group being formed to draft a strategic plan to improve agricultural statistics. This working group, under the guidance of the UN Statistics Division, included the World Bank, FAO, Eurostat, the US Department of Agriculture, and the International Statistical Institute.

The *Global Strategy* (World Bank, et al. 2011) states that: *The purpose of the Global Strategy is to provide the framework for national and international statistical systems to produce the basic data and information to guide the decision making required for the 21st century. It is based on three pillars:*

- *The first pillar is the establishment of a minimum set of core data that countries will provide to meet the current and emerging demands.*
- *The second pillar is the integration of agriculture into the national statistical systems in order to meet policy maker and other data user expectations that the data will be comparable across countries and over time. The integration will be achieved by implementing a set of methodology that includes the development of a Master Sample Frame for Agriculture, the implementation of an Integrated Survey Framework, and with the results available in a Data Management System.*
- *The Third Pillar is the foundation that will provide the sustainability of the agricultural statistics system through governance and statistical capacity building.*

The Global Strategy is based on a thorough assessment of data user needs and what is currently available. This revealed that not only is there a serious decline in the quantity and quality of agricultural statistics, it is occurring at the same time many new data requirements are emerging. These emerging data requirements include issues surrounding agriculture including poverty and hunger, global warming, the use of land and water, and the increasing use of food/feed commodities to produce biofuels.

These data requirements led to defining a conceptual framework that provides an overview of the economic, social, and environmental dimensions of agriculture. This conceptual framework brings forestry, fisheries, and land and water use into the agricultural and rural framework. The conceptual framework and data requirements call for a linkage between the household, the agricultural holding, and the land they occupy. The scope and coverage of agricultural production and activities is outlined.

FOCUS TABLE IV.1
Menu of indicators, data requirements, data sources and technical notes

	Indicator	Data Requirements	Data Sources	Technical Notes
	Sector Wide indicators for agriculture and rural development			
1	Gross Domestic Product (GDP)		Censuses and surveys of firms, farms, and households for small holders.	Value added should include unreported activities as well as the value of informal or small scale operations. Annual estimates between census or surveys based on extrapolations based on other indicators.
2	GDP growth from Agriculture value added.	Estimates of total production and value for all commodities produced in the country; including that from small holders/household plots minus estimates of the cost of inputs such as seed, feed, energy, fertilizer, labor, etc. Agriculture includes forestry and fisheries	Censuses and surveys agricultural enterprises, farm and rural households, administrative and processor. data	SNA concepts followed. Problems include estimation of output consumed by the household and the annual coverage of all commodities for which only periodic census data are available. Annual estimates made using previous census and other administrative data if available.
3	Amount of public spending on agriculture, subsidies, and infrastructure	Government budget allocations, and spending related to agriculture. Agriculture includes forestry and fisheries	Ministry of Finance, National Accounts, Planning commissions, Donor reports	The definition for public spending on agriculture should follow the UN Classification of Functions of Government (COFOG) for agriculture
4	Amount of public spending on rural infrastructure including health and education	Government budget allocations, and spending related rural areas	Ministry of Finance, National Accounts, Planning commissions, Donor reports	Rural defined using national description
5	Change in Investment in capital stock	Inventories of machinery and equipment owned by agricultural holdings, buildings such as milking purposes, animal breeding stock, area of semi-permanent crops such as trees and vineyards, number of trees and vines	Agricultural resource surveys of holdings and agricultural enterprises	Machinery and equipment inventories should be by purpose (tillage, harvesting, etc.) and size
6	Demographics of agricultural and rural population	Rural population and number of rural households, number of agricultural households and population living in them, age and education levels. Agriculture includes forestry and fisheries	Census of Population, Census of Agriculture, Household surveys, administrative records	Rural defined using national description

	Indicator	Data Requirements	Data Sources	Technical Notes
7	Rural poor as a percent of total poor population	Household income and consumption estimates for national and rural poverty lines. Purchasing Power Parities for comparisons across countries	Household Surveys. International Comparison Program for comparisons across countries	Countries should use poverty estimates based on PPPs and extrapolate between ICP benchmarks
8	Rural hungry as a percent of total poor population	Household income and food consumption estimates for national minimum energy requirements.	Household Surveys. International Comparison Program for comparisons across countries	Countries should use hunger estimates for monitoring food deprivation levels
9	Food production index	Area, production and yield for food crops, livestock numbers and production of meat, milk, eggs, fish captured and cultured, and other food products, non-food use of food products, food imports and exports	Agricultural Census, surveys of agricultural enterprises, processors, fish landings, administrative data such as imports, exports. Food Balances and Household consumption surveys	Follow FAO guidelines for inclusions and exclusions
10	Change in value of Trade—imports and exports	Imports and exports—quantities and values of agricultural products including fishery and forest products	Customs inspections—in some countries the customs offices collect the data which then are turned over to the national statistical office for compilation	National statistical offices should collaborate with customs officials to ensure coding and classifications follow international guidelines
	Indicators for subsectors of agricultural and rural			
11	Productivity of Crop production as measured by crop yields	Quantity harvested per unit of area such as hectare and area harvested. Area harvested, distinguished between irrigated-harvested crops and rainfed-harvested crops	Census of Agriculture, crop cutting surveys. Production sample surveys, processor surveys, such as oil seed crushers, cotton ginners	Difficult to measure with multi-cropping or with crops that can be harvested > once a year. Crop cutting can over estimate yields
12	Change in components of crop balances	Area Harvested, Quantity harvested, quantities imported/exported, change in stocks, quantities by utilization such as food, bio fuels, own consumption, for every crop including those produced for fiber and oil	Surveys of agricultural enterprises, administrative data on trade, processors by utilization, household surveys for own consumption	Crop balances should reflect the growing cycle and marketing year which could be different from the calendar year.
13	Livestock value added	Estimates of quantity and value of production of meat, and poultry, milk, eggs, by products	Surveys of agricultural holdings, enterprises such as slaughter plants, dairies,	Own consumption should be included, difficult to measure.

	Indicator	Data Requirements	Data Sources	Technical Notes
		such as hides and skins, wool mohair minus costs of inputs such as feed and replacement stock	processors. Household surveys for own consumption	
14	Change in components of Livestock and poultry Balances by species	Number of animals born, acquired, slaughtered, deaths from disease. Number of animals by purpose such as breeding, meat, milk, wool, and by age breakdowns relevant to specie. (see FAO 2010 Census)	Surveys of agricultural holdings at least annually but more often for species with more frequent births during a reference period. This ranges from annually for cattle to monthly for egg production.	Data collection intervals should reflect the reproductive cycles. This suggests annual for cattle, semi- annual for pork, quarterly or shorter for poultry, milk,
15	Change in productivity of Capture Fish production	Quantity of fish taken by unit of fishing effort; Scientific estimates of fish stock and exploitation rates;	National fishery surveys, surveys at landing sites, on-board observers, national, regional and global assessment results;	
16	Change in productivity of aquaculture	Estimates of quantity and value of production of fish by species minus costs and quantity of inputs such as seed, feed and fertilizers	Surveys of aquaculture enterprise, and holdings, aquaculture census, market certifications,	
17	Change in components of fish balances	Quantities and value of captures form coastal and offshore waters, rivers and lakes including non-landed catch; Quantities and value of products from aquaculture; utilizations including own consumption and discards, imports and exports, inputs such as seed and feed; outputs such as stocking; for each aquatic species	National fishery surveys, fishery census, aquaculture census, surveys of fishery and aquaculture enterprises, , processors, market information, administrative and inspection sources	See CWP Handbook, FAO coding and classification
18	Change in components of forestry balances	Quantity and value of removals of products from forested areas and respective utilizations	Appropriate ministries, satellite imagery, price surveys or processor data	
19	Commodity Price indexes	Market reports of prices being offered by commodity and location. Prices received by the enterprise at the first point of sale,	Market observers, Surveys of enterprises, agro enterprises purchasing commodities from agricultural enterprises	Care needed to ensure units of measure for pricing are comparable
20	Consumer Price indexes	Monthly/seasonal prices paid by the consumer	Consumer Price Index,	Care is needed to ensure highly seasonal products do not distort the price series.
21	Early warning of	Monthly/seasonal	Windshield surveys of	These do not have to be

	Indicator	Data Requirements	Data Sources	Technical Notes
	change in food security	prices paid by the consumer	crop conditions, amount of precipitation, satellite imagery of vegetative indexes, changes in trade data, animal disease outbreak	statistically rigorous, mainly to provide an early warning that other interventions are needed
	Climate Change, land, and the environment			
22	Change in Land Cover and use	Land Cover Classification System (LCCS), Area and geo-referenced for Cultivated land, Grass/pasture, inland water, marine water, wetlands, shrubland, woodland, fallow/idle cultivated land, barren land, urban/developed areas, areas equipped for irrigation.	Land use surveys, satellite imagery. Geo referenced data on economic situation of agricultural holdings needed to understand effect of policy decisions on land use.	Ground truth data required to provide more detailed breakdowns of cultivated land, especially for crops in small plots. Difficult to apply in detail where multi-cropping is used.
23	Change in proportion of land area covered by forests, rate of deforestation	Area geo referenced to map materials	Ministry responsible for forestry, satellite imagery	Follow LCCS classification
24	Percent of land and water area formally established as protected areas	Land and water area and geo referenced to mapping material	Responsible ministry—satellite imagery	Follow LCCS coding with expansion covering inland and marine water bodies
25	Irrigated land as percent of total cropland Productivity of irrigation	Total cropland and area irrigated by source of water for irrigation (surface water, groundwater, treated wastewater, etc.) - by method (surface, sprinkler, localized irrigation) Crop yields from irrigated land compared to yields from non irrigated areas.	Agricultural Census, other crop related surveys or water user survey	Irrigation refers to the artificial application of water to assist in the growing of crops (and pastures). Can be done by letting water flow over the land ("surface irrigation"), by spraying water under pressure over the land concerned ("sprinkler irrigation"), or by bringing it directly to the plant ("localized irrigation")
26	Withdrawal of water for agriculture as a percent of total water withdrawal	Area under irrigation, number of irrigations, irrigation intensity and requirements by crop, water withdrawal and turn over rate for aquaculture consumption, per capita consumption by people and animals	Appropriate ministries, special studies or surveys to estimate water use in agriculture and aquaculture, surveys of aquaculture enterprises and holdings.	Should include both surface and ground water. Coding and classifications should be defined

	Indicator	Data Requirements	Data Sources	Technical Notes
27	Change in soil loss from watersheds	Reduction in crop yields, reduction in area of cultivated land	Appropriate ministries, geo referenced data with satellite imagery	
28	Change in affect of inputs on the environment	Fertilizer, pesticide, and other chemicals applied to the soil, water bodies, and plants by type of crop and watershed area, stocking	Agricultural census and or follow-up surveys to measure fertilize and chemical use, tillage methods	Data should be geo referenced to land cover and use
	The agricultural and rural economy			
29	Number of family and hired workers on the holding	Include Unpaid labor of the operator of the holding and family members plus number of hired workers	Labor force surveys of holdings	Need to establish standards for minimum ages of workers and the number of hours worked per week to be considered a worker. Need to ensure female workers are counted
30	Number of household members employed by farm and non farm	The employment status for work off the agricultural holding for each household member	Labor force surveys—household surveys	
31	Change in Farm and Rural non farm household income from all sources	Income to the household by sector, crop, livestock, etc. Income from investments or employment outside the agricultural holding	Rural Household Survey.	Rural to be classified using range in population density.
32	Percent of rural population using services of formal banking institutions	Total number of rural households, number using credit or savings services	Central Bank or commercial banks, special surveys, agricultural census	
33	Change in sales of agro enterprises	Sales, net profits of enterprises providing services to agriculture	Special surveys	Use standard accounting principles

Source: (World Bank, et al., 2011)

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World Bank, FAO and UNSC (2011). *Global Strategy to Improve Agricultural and Rural Statistics*. Report no 56719-GLB. World Bank, Washington DC.

Focus on the List of Priority Indicators in Less-than-Ideal Conditions

Recent work on the rural world (GDPRD et al. 2008) underlines the importance of the construction of a logical framework for the monitoring and evaluation of rural development.

The effort was to create a core set of 19 priority indicators among the 86 ones originally chosen. In preparing the menu, due care has been taken to include indicators covering all sub-sectors of agriculture and rural development and workable even in situations where data availability is less-than-ideal and where statistical capacity is limited.

This core set comprises:

A. Sector-wide indicators for agriculture and rural development

1. Public spending on agriculture as a percentage of GDP from the agriculture sector
2. Public spending on agricultural input subsidies as a percentage of total public spending on agriculture
3. Percentage of underweight children under-5 years of age in rural areas
4. Food production index
5. Annual growth in agricultural value added
6. Rural poor as a proportion of the total poor population

B. Specific indicators for sub-sectors of agriculture and rural development

7. Change in yields of major crops
8. Annual growth in value added in the livestock sector
9. Capture fish production as a percentage of fish stock
10. Proportion of land area covered by forest
11. Percentage of the rural population using financial services of formal banking institutions
12. Public investments in agricultural research as a percentage of GDP for the agricultural sector
13. Irrigated land as a percentage of crop land
14. Change in sales/turnovers of agro-enterprises

C. Indicators for thematic areas related to agriculture and rural development

15. Percentage of farmers who are members of community/producer organizations
16. Withdrawal of water for agricultural as a percentage of total fresh water withdrawal
17. Proportion of land area formally established as protected area
18. Change in soil loss from watersheds

19. Percentage of land area for which there is a legally recognized form of land tenure

FOCUS PIECES

GDPRD, FAO & World Bank (2008). *Tracking results in agriculture and rural development in less-than-ideal condition. A sourcebook of indicators for monitoring and evaluation*. FAO, Rome.
ftp://ftp.fao.org/docrep/fao/011/i0380e/i0380e.pdf

CHAPTER V

INVENTORY OF NATIONAL APPROACHES TO RURAL DEVELOPMENT STATISTICS

V.1 INTRODUCTION

The need for a new set of statistics or for more detailed information on a specific area generally arises from a shift in policy focus. Rural development statistics are no exception. As noted in Chapter I, over recent years rural development has become an important policy issue in most countries.

In OECD countries, the problems in rural areas are increasingly not directly related to agriculture as an industry (see Chapter II), though its instrumental role in achieving environmental aims has risen to prominence. Especially in countries where agriculture only accounts for a small percentage of both production and employment in rural areas, the main focus of rural policy has started to move away from agriculture towards targeting the wider rural economy and population. In developing countries (using the term broadly to cover a wide range of economic situations) and in most members of the Commonwealth of Independent States (CIS) rural development has emerged as a distinctive field of policy, practice and research, resulting from a general disenchantment with previous approaches to development planning at national and sectoral levels. This new approach is defined by its concern with equity objectives of various kinds, in the sense that it focuses particularly on poverty and inequality.

In both types of country the term "Rural Development" now refers to a distinct approach which is at once broader and more specific than "agricultural development" (Harriss, 1982). It is broader because it entails much more than the development of agricultural production, and is more specific in the sense that it is, in fact, a distinct approach to the development of the economy as a whole. Notwithstanding this common ground, the policy issues and their instruments, and hence the indicators for their monitoring, may differ considerably between OECD countries, on the one hand, and CIS and developing

countries, on the other. This is important to note when discussing an international core set of indicators to monitor rural development.

This shift in policy focus has been recognised in some countries in the name of the departments/ministries. Examples are the Department of Environment, Food and Rural Affairs in the United Kingdom, the Ministry of Agriculture, Rural Development and Fisheries in Portugal, the Ministry of Agriculture and Rural Development in Israel and the Ministry of Agriculture and Regional Development in Hungary. In other countries, the issues of rural development have been added to the responsibility of the ministry that deals with agricultural policy without a change in name. For example, the United States Department of Agriculture covers rural development issues. Alternatively, rural development can come under the responsibility of ministries without a link to agriculture, such as the Ministry of the Interior and Health in Denmark or the Ministry of Industry, Employment and Communication in Sweden or Ministries dedicated to dealing with regional issues such as the Ministry for Regional Development and Regional Authorities in the Czech Republic.

Regardless of where the responsibilities lie, it has been widely recognised that in OECD countries rural development statistics need to look far beyond agriculture. Rural development statistics have to cover not only the wider economic conditions in rural areas but, in many countries, also social and environmental conditions (see Hill, 2002). An interesting division exists between the EU and the US in the extent to which environmental policy, or rather that part that can be delivered by agriculture and forestry, is regarded as part of rural development and thus is expected to appear within statistics for rural areas; in the EU agri-environmental schemes are a major user of funds allocated to rural development by the Common Agricultural Policy, whereas such matters are typically treated as part of environmental policy in the US (recently two special issues of *EuroChoices* have been given over a comparative study of rural development policy in the two areas, including the indicators used to assess its performance). Getting this wider coverage of rural development statistics right is one of the challenges for statisticians working on the creation of a system of rural development statistics.

A final point concerns the availability of information on rural development on the Internet. This is still fairly limited, especially in developing countries, mainly because of the high costs of specific software tools to support statisticians in the various phases of the statistical data life cycle. A consequence is a kind of digital divide, something that may be significantly reduced by the adoption of *open source* (free) technologies and tools. These instruments are intrinsically designed to enhance a generalized and integrated approach to statistical data manipulation (e.g. editing and imputation, sampling design and estimation), as well as an effective and timely *data dissemination*, mainly in the form of specifically designed data warehouses available on the Internet (Barcaroli *et al.*, 2009).

V.2 INVENTORY OF NATIONAL RURAL DEVELOPMENT STATISTICS

As the demand for internationally comparable information rises, some kind of standard set of indicators is desirable. In an increasingly globalized world, policy makers, researchers and the general public are not only interested in statistics showing what is going on in their country but also statistics on how their country compares to others such as neighbouring countries or countries with similar environmental, climate, social or political conditions. The sensitivity of results to the definition of what is a rural area has already been established (see Chapter III), and comparability hinges on harmonisation of such a definition. Here, though, the focus is on the indicators themselves.

Much of this Chapter is devoted to describing the state of rural development statistics in a range of countries as found by a survey carried out by the UNECE. Some background information may be helpful.

In the spring of 2003, as a move that accompanied setting up the Task Force to develop the present Handbook, the UNECE started a project aimed at establishing an inventory of rural development statistics in member countries of the UNECE and OECD. This project did not attempt to cover developing countries as, at the time, the focus of Handbook did not extend to them (this broadening occurred from about 2003 and after first publication in 2005). After initial research on the Internet, a questionnaire was sent to 12 countries (Canada, Czech Republic, Denmark, France, Germany, Hungary, Ireland, Italy, Romania, Sweden, United Kingdom and the United States).

A summary of the replies of 11 of these countries was presented at the Meeting on Food and Agricultural Statistics held in Geneva in July 2003. Discussion of these first-round results highlighted some key issues.

- Participants pointed out that rural development statistics should be seen in the larger framework of regional/territorial statistics, as the increasing demand for statistics on small geographic areas is not limited to rural areas. A general system based on statistics for small geographic areas should be built up which could be flexible and accommodate different definitions and different classifications.
- A requirement to better understand policy needs emerged. Rural development statistics provide the evidence-base for rural development policy and therefore policy needs should be at the centre of statisticians' preoccupations.
- With the decoupling of agricultural subsidies it was likely that there would be more demand for rural development statistics.
- It was clear that rural development is much broader than agriculture and that a statistical approach needs to cut across traditional statistical categories of which agriculture is one. The possibility was raised that agricultural statisticians could coordinate rural development statistics, building on their knowledge of agricultural statistics.
- Though the usefulness of a standard definition of rural held attractions, it was noted that it might be difficult and/or not appropriate to have a standard

> definition due to the differences between countries. Others expressed the need for some kind of standard, pointing out that differences within countries can be larger than those between similar areas of different countries and that demand for internationally comparable data is increasing. There was general agreement though that more work needs to be done on an international level both on the definition of rural and on the rural development indicators.

As a result, the UNECE sent a questionnaire to all countries that participated in the meeting. The questions are shown in Box V.1; they cover a mix of issues (administration and organization, technical, definition used, contents and information on policy aims and main results). Replies were received from 26. The aim of the questionnaire was to establish which organisations are responsible for rural development policy and rural development statistics, what the aims of the rural development policies are, as well as how rural is defined and what kind of statistics are available at present. The question of which specific indicators could be used to satisfy the need for internationally comparable rural development statistics was not addressed by the UNECE project. However, both the OECD and Eurostat have carried out work in this area (see OECD, 1994 and Hay, 2002) (see Chapter VI).

No attempt has been made since the 2003 UNECE survey to update the information or to extend the coverage to include developing countries, though both could be valuable steps to be taken when the next edition of the Handbook is prepared.

The results of two sections of the questionnaire survey are presented here: the availability of rural development and related statistics and rural development policy. These are considered of relevance to readers from countries at all stages of economic development and are thus included in the Handbook's Core Text. The issue of the definition of rurality has already been dealt with in Chapter III above and its linked document. More detailed summaries of the replies by individual countries to the questionnaire, including the request for information on the definition employed of what is a rural area, is given in the following link.

Focus on UNECE Survey of Rural Development Statistics Undertaken in 2003

BOX V.1
The UNECE's 2003 survey rural development statistics

Rural Development Statistics Questionnaire

Rural Development Statistics

1. Which organization(s) is/are responsible for statistics on rural areas?
2. What variable(s) is/are used to distinguish rural from non-rural areas?
3. Are there any subdivision of rural areas relating to the degree of rurality?
4. What is the threshold value that classifies an area as rural?
5. What is the smallest territorial unit/area on which the definition of rural is based (e.g. postcode areas, community district, communities, district or regions)?
6. What is the percentage of the population that is classified to live in rural areas?
7. What is the percentage of the total land area that is classified as rural?
8. Is there a set of core indicators used to monitor rural development policy?
9. Can rural development be found on the Internet and if so where?

Availability of statistics for small areas

10. What is the smallest area for which statistics are available and what is the average size of this area (e.g. average population size, average area, range of population size or range of area)?
11. What statistics are available for this smallest area?
12. Are statistics on urban settlement/urban land use available?

Rural Development Policy

13. Which organization(s) is/are responsible for rural development policy?
14. What are the aims/objectives of rural development policies?
15. What are the main themes of rural development?

V.3 AVAILABILITY OF RURAL DEVELOPMENT AND RELATED STATISTICS IN UNECE/OECD COUNTRIES

In many of the countries that took part in the survey more than one organisation collects and produces statistics on rural development, reflecting the cross-cutting issues involved. Therefore, it is not as straightforward as in some other policy areas to compile an inventory of available statistics and indicators. However, in all countries some, but not necessarily the main, **responsibility** lies with the national statistical office. In countries that are based on a federal principal the regional statistical offices also play an important role in the collection of rural development statistics (e.g. Australia, Canada, Germany and the Russian Federation). Frequently, ministries also share the responsibility for statistics on rural development.

The replies to the question of whether there was a core/standard set of indicators to monitor rural development showed that **several countries were in the process of developing or were investigating the need for a set of indicators** to monitor rural development. In several countries, sets of indicators existed that were directly linked to the monitoring of the EU Special Accession Programme for Agriculture and Rural

Development (SAPARD) and the EU Rural Development Plan (the UNECE project was initiated before the round of EU enlargement in 2004). The nature of these programmes implied that the indicators were likely to reflect aspects of rural development associated with the agricultural community. One example of a set of indicators for rural development **not** linked to agricultural policy was the Finnish Rural Indicators project; a list of the entire set can be found in the UNECE survey document, the link to which is given above.

The questionnaire also revealed that at the time (2003) the information on rural development available on the **Internet** was fairly limited. Several countries indicated that no rural development statistics were then available in this way. In many other cases some regional and/or rural data were available on different sites. Very few countries had information on a dedicated site at that time.

Questions 10 to 12 focused on small area statistics. Again the answers are summarised in the linked document. They showed that in the majority of countries the **smallest areas for which statistics were available** were municipalities, which often corresponded to the EU NUTS5 areas. Nine countries produced statistics for even smaller areas, usually some sub-division related to the organisation or presentation of data in the population census. The reason for including these questions was to get some idea of the feasibility of basing an international standard for the definition of "rural" on territorial units not linked to administrative areas and/or those smaller than a municipality/village. The answers seemed to suggest that a definition based on areas that do not correspond to administrative areas would require many countries to produce two sets of statistics - one for the administrative areas for which statistics are currently required and another one for different territorial units which are not based on the current territorial units.

Finally, the questionnaire asked for the **percentage of the population** living in rural areas and the **percentage of land** classified as rural, perhaps the most basic of rural indicators. The results are presented in Table V.1. The figures are based on the national definitions of "rural" and therefore the **comparability** is very limited. Such figures are used for international comparisons (for example, in the World Urbanization Prospects published by the Population Division of the Department of Economic and Social Affairs of the UN) as they are the only ones available. The OECD has developed a definition based on population density (see Chapter III) and statistics for OECD countries are available based on this definition.

TABLE V.1
Rural population and rural land

	What is the percentage of population that are classified to live in rural areas?	What is the percentage of the total land area that is classified as rural?
Australia	12.84 percent	99.74 percent
Bulgaria	41.9 (11.2 percent in less developed countries)	83.7 percent
Canada	22 to 38 percent depending on the definition used	99.8 percent "rural" and 95 percent "predominantly rural" (OECD definition)
Czech Republic	26.5 percent	73.7 percent
Estonia	32.6 percent	98.4 percent
Finland	43 percent (27 percent excluding urban adjacent rural areas)	95 percent (83 percent if urban adjacent rural areas)
France	24 percent	82 percent
Germany	13.03 percent	30.35 percent
Hungary	Narrow definition: 47.35 percent; broader definition: predominantly rural 31.3 percent and significantly rural 68.7 percent	Narrow definition: 88.33 percent; broader definition: predominantly rural 58.3 percent and significantly rural 37.7 percent
Ireland	n/a	n/a
Italy	n/a	n/a
Kyrgyzstan	65 percent	28.8 (59.3) percent of the land is agricultural land and land of rural settlements (about 90 percent of the territory lays higher than 1,500 m above sea level
Latvia	47.5 percent	98.2 percent
Lithuania	33.1 percent	97 percent
Netherlands	n/a	n/a
Norway	22.3 percent (population not living in urban settlements)	99.3 percent (land outside urban settlements)
Romania	45.4 percent	89 percent
Russian Federation	27 percent	n/a
Slovakia	29.9 percent (OECD definition at NUTS 4 48 percent predominantly rural areas)	76.7 percent (OECD definition 59.5 percent in predominantly rural areas)
Sweden	35 to 40 percent	more than 95 percent
Switzerland	32 percent	77 V
Turkey	35.1 percent	n/a
United Kingdom	n/a	n/a
England	20 percent (settlement based definition) 28 percent (ward based definition)	93 percent (settlement based definition) 87 percent (ward based definition)
Scotland	30.9 percent*	n/a
Wales	32 percent	82 percent
Northern Ireland	n/a	n/a
United States	21 percent (Census Bureau definition) 20 percent (ERS definition)	97 percent (Census Bureau definition) 80.8 percent (ERS definition)

Source: *UNECE Rural Questionnaire*, 2003.
http://www.scotland.gov.uk/Publications/2003/05/17207/22175

Looking at the data available for Canada, England and the United States, which all had two or more definitions in common use, it can be seen that the different definitions can have sizeable effects on the indicators. For England, the population living in rural areas was either 20% or 28% depending on the definition used. The land in rural areas was 87% or 93%. For the United States, the difference between the two definitions was larger for the land area than for the population. In Canada the rural population varied between 22% and 38%. In addition, the overlap between the definitions was smaller than might be assumed; not all the 20% of the population classed as rural in the English urban settlement definition was also included in the 28% classed as rural according to the administrative area definition.

Another feature was the comparatively low figure for land in rural areas in Germany. The reason for this is that the smallest geographic unit used in the classification was a "Kreis", an administrative area consisting of several municipalities. All other countries in this sample based their definition on smaller geographic units. Generally, the smaller is the basic geographic unit used in the classification, the higher the percentage of land classified as rural.

Due to the lack of comparability of the data, it is difficult to draw any other conclusions from the data presented in the table. The same will be true for every indicator of rural development - whether economic, social or environmental. The impact the definition of rural has on rural indicators in Canada are shown in a research paper by Du Plessis *et al.*, 2002. It would be interesting to carry out similar research on an international level using different national definitions. This would show, for example, whether the differences in the rural population can be attributed mainly to differences in the definition or mainly due to actual physical differences in the various countries.

V.4 RURAL DEVELOPMENT POLICY IN UNECE / OECD COUNTRIES

Even though it is connected to agricultural policy and often emerges from it, rural development has a much wider scope. While agriculture plays a part in rural development, in many countries this is small and declining. Hence, rural development policy does not necessarily need to fall within the **responsibility** of the same organisation as does agricultural policy. In different countries, rural development is under the responsibility of different ministries/departments.

The 2003 survey found that in most countries the **ministry responsible for agricultural policy** was also the major player (e.g. Bulgaria, Estonia, Finland, France, Hungary, Kazakhstan and Slovakia) or one of the principal players (e.g. Australia, Lithuania, Netherlands and Romania) in rural development policy. In other countries, the main responsibility for rural areas fell within the scope of other ministries such as the Ministry of Industry, Employment and Communication in Sweden, the Department of Community, Rural and Gaeltacht Affairs in Ireland, the Ministry for the Interior and Health in Denmark and the Ministry for Regional Development and Regional Authorities in the Czech Republic. In several countries regional governments played a major role in developing and implementing rural development policies (e.g. Australia, Germany, Italy, Netherlands and the Russian Federation).

The UNECE questionnaire also included questions about the **objectives and major themes** of rural development policy. The replies showed that the focus of rural development varied considerably between countries. In Canada for example, the aim was to improve the well-being of rural citizens. In the United States, the emphasis was on the improvement of the quality of life in rural areas. In most EU Member States and (then) acceding countries, rural development was much more closely linked to agricultural policy, as rural development fell (and still falls) within the second pillar of the Common Agricultural Policy.

In order to decide on the scope and the focus of rural development statistics, it is important to understand the aims of rural development policy. The focus will be different depending on whether policy is mainly addressed at the agricultural community or more generally at the rural community.

To determine what general topic areas should be covered by rural development statistics, a question was included in the UNECE survey about what the main themes and objectives of rural development policy should be. The answers generally fell within the following main areas:

- Economic/employment;
- Service provision/Infrastructure;
- Environment;
- Social and
- Preservation or renewal of rural communities and tradition.

The importance attributed to agriculture differed greatly between countries, ranging from being a main focus to only playing a minor part.

V.5 NATIONAL CASE STUDIES

Case studies can be useful in describing in detail how statistical authorities in individual countries have devised sets of indicators for rural areas that meet the requirements of national governments. Each will reflect a particular mix of policy environment and data availability. Preferably these case studies will illustrate a range of situations and levels of economic development, including different capacities within of the statistical system, ways of collecting data etc.. The way in which such statistics are organised, though not necessarily directly reproducible elsewhere, may stimulate discussion of solutions in other circumstances.

This section provides links to case studies of rural developments statistics compiled by countries. The intention is that as this web-based Handbook is updated, additional country examples showing good practise will be added.

Focus on Canada: Case Study

Focus On England (United Kingdom): Case Study

Focus On India: Case Study

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Statistics Canada. *Rural and Town Canada Analysis Bulletin*. Various issues.

Website for England's rural statistics
www.defra.gov.uk/rural/

INFORMATION ON RURAL DEVELOPMENT AND RELATED STATISTICS AVAILABLE ON THE INTERNET FOR SELECTED COUNTRIES

Australia
Australian Bureau of Statistics (small area statistics under Themes – Regional Statistics)
www.abs.gov.au/

Bulgaria
Ministry of Agriculture
www.mzgar.government.bg

Canada
Canadian Rural Partnership:
www.rural.gc.ca
Rural and Small Town Canada Analysis Bulletin:
www.statcan.ca/english/freepub/21-006-XIE/free.htm
Statistics Canada – community profiles:
www12.statcan.ca/english/profil01/PlaceSearchForm1.cfm
Statistics Canada - Definition of Rural:
www.statcan.ca/english/IPS/Data/21-601-MIE2002061.htm

Denmark
Statbank Denmark:
www.statistikbanken.dk/

Estonia
Statistical Office (regional statistics on local government units, county and NUTS 3 level)
www.stat.ee/

France
INSEE (statistics on rural and urban zones):
www.insee.fr (rubrique "territoire")

Germany
Federal Office for Building and Regional Planning
www.bbr.bund.de/
Federal Statistical Office
www.destatis.de/themen/d/thm_regional.htm

Hungary
Ministry of Agriculture and Regional Development
www.fvm.hu/english/annex2.pdf

Kazakhstan
Agency of Statistics
www.stat.kz

Kyrgyzstan
Statistical Office

www.stat.kg

Latvia
Central Statistical Bureau (Agricultural Census and Population Census data)
www.csb.lv/

Lithuania
Statistics Lithuania (regional and agricultural statistics)
www.std.lt

Norway
Statistics Norway (regional statistics)
www.ssb.no/english/subjects/00/00/02

Russian Federation
Ministry of Agriculture and Food
www.aris.ru/ (Russian)
Goskomstat Russia
www.gks.ru/ http://www.gks.ru/eng/
Institute of Agricultural Marketing
www.apkmarket.ru/ http://www.apkmarket.ru/aboute.html

Switzerland
Federal Statistical Office (Scattered information)
www.bfs.admin.ch

United Kingdom
Department for Environment, Food and Rural Affairs (Defra)
http://www.defra.gov.uk/rural/default.htm
Office for National Statistics (ONS)
http://www.statistics.gov.uk/geography/nrudp.asp
Scotland www.scotland.gov.uk
Wales www.wales.gov.uk

United States
United States Census Bureau
www.census.gov/
Bureau of Labor Statistics
www.bls.gov/
Bureau of Economic Analysis
www.bea.gov/
Economic Research Service
www.ers.usda.gov/
National Agricultural Statistics Service
www.nass.usda.gov/

Focus on Results of UNECE Survey on Methods Used for Measuring Rural Development Statistics in UNECE and OECD Member Countries

Following the tabular summaries of responses to each of the questions shown below, annexes deal with specific situations in Finland, Latvia and Bulgaria.

FOCUS BOX V.1
The UNECE 2003 survey rural development statistics

Rural Development Statistics Questionnaire

Rural Development Statistics

1. Which organization(s) is/are responsible for statistics on rural areas?
2. What variable(s) is/are used to distinguish rural from non-rural areas?
3. Are there any subdivision of rural areas relating to the degree of rurality?
4. What is the threshold value that classifies an area as rural?
5. What is the smallest territorial unit/area on which the definition of rural is based (i.e. postcode areas, community district, communities, district or regions)?
6. What is the percentage of the population that is classified to live in rural areas?
7. What is the percentage of the total land area that is classified as rural?
8. Is there a set of core indicators used to monitor rural development policy?
9. Can rural development be found on the Internet and if so where?

Availability of statistics for small areas

10. What is the smallest area for which statistics are available and what is the average size of this area (e.g. average population size, average area, range of population size or range of area)?
11. What statistics are available for this smallest area?
12. Are statistics on urban settlement/urban land use available?

Rural Development Policy

13. Which organization(s) is/are responsible for rural development policy?
14. What are the aims/objectives of rural development policies?
15. What are the main themes of rural development?

Note: this survey was conducted in 2003

Link to the detailed questionnaire

Focus on Canada: Case Study

In many respects the rural statistical system in Canada is very advanced and lends itself to detailed analysis of policy issues related to various types of rural areas *vis-à-vis* both urban areas and the country as a whole. Many of the results appear in the ***Rural and Small Town Canada Analysis Bulletin*** series, which is published by Statistics Canada (and available at the Statistics Canada website: www.statcan.ca/english/freepub/21-006-XIE/free.htm). After reviewing the definitions and typologies used by Statistics Canada, selected results extracted from this Bulletin will be presented. These give a good illustration of what is achievable given the availability of a well-developed statistical system based on stringent definitions related to well proven survey methods.

Only a small fraction of the statistics from the various issues of the ***Rural and Small Town Canada Analysis Bulletin*** is presented here[1]. For instance, the detailed statistics broken down by categories such as regions or genders, which are of prime importance for rural development statistics, are, for reason of space, only briefly mentioned here. Readers interested in these breakdowns should consult the original sources.

Definitions and typologies [Vol. 4, No. 8]

Several alternative definitions of "rural" are used in Canada for national and provincial level policy analysis. The policy issue and the geographical focus being addressed (e.g. local, regional, national or international), leads an analyst to choose one definition over another. The definition chosen is of course also dependent on available data sources.

There are six alternative ways of defining "rural" in Canada. Depending on the definition of rural being applied, between 22% and 38% of the Canadian population are defined as rural. Three definitions will be shown below.

Definition 1: For analysis of metropolitan versus non-metropolitan regions and their sub-categories

This definition is based on census divisions (CDs) as the "building block" for defining regional types. This typology is equivalent to the Beale Code typology developed by Calvin Beale at the USDA.

***Metropolitan regions*:** 50,000 or more people living in urban settlements (where an urban settlement has a population of 2,500 or more inhabitants)

1. **Major metro (central)**: CDs with urban settlements of one million or more (central)
2. **Major metro (fringe)**: CDs with urban settlements of one million or more (fringe)
3. **Mid-sized metro**: CD with urban settlements of 250,000 to 999,999 people

[1]References are made in the text to the various volumes and issues of this periodical without each time mentioning the name of the periodical.

Non-Metropolitan regions: (those with under 50,000 people living in urban settlements)

4. **Small city (metro-adjacent)**: CDs with 20,000 to 49,999 living in urban settlements, adjacent to a metropolitan region.
5. **Small city (non-metro-adjacent)**: CDs with 20,000 to 49,999 living in urban settlements, non-adjacent to a metropolitan region.
6. **Small town (metro-adjacent)**: CDs with 2,500 to 19,999 living in urban settlements, adjacent to a metropolitan region.
7. **Small town (non-metro-adjacent)**: CDs with 2,500 to 19,999 living in urban settlements, non-adjacent to a metropolitan region.
8. **Rural (metro-adjacent)**: CDs with no people in urban settlements with 2,500 or more, adjacent to a metropolitan region.
9. **Rural (non-metro-adjacent)**: CDs with no people in urban settlements with 2,500 or more, non-adjacent to a metropolitan region.
10. **Northern**

Definition 2: The second typology concerns Rural and Small Town (RST) areas.

This definition focuses on the population living outside the commuting zones of larger urban centres or more specifically outside so-called Census Metropolitan Areas (CMA) and Census Agglomerations (CA). The more precise definitions of these concepts are:

- **Rural and Small Town** (RST) areas have a population of 1 - 9,999 where less than 50% of the employed individuals commute to a CMA/CA and less than 25% commute from a CMA/CA
- **Census Metropolitan Areas** (CMA) has an urban core of 100,000 or over and includes all neighbouring municipalities where over 50% of more of the labour force commutes into the urban core or more than 25% commute from a CMA/CA
- **Census Agglomerations** (CA) has an urban core of between 10,000 and 99,999 and abides by the same commuting rule as CMAs.

Definition 3: The third definition is based on the OECD definition

The OECD definition distinguishes between:

- **Predominately urban** regions
- **Intermediate** regions; and
- **Predominately rural** regions, sub-divided into
  - Metro-adjacent
  - Non-metro-adjacent; and
  - Northern regions

The major data sources for the rural and urban statistics are census data and labour force surveys.

Results

Below a compilation is presented showing a few examples of results that have been extracted from various issues of the ***Rural and Small Town Canada Analysis Bulletin.*** Tables and graphics are grouped together at the end of this section.

(i) Population issues

Migration to and from rural areas [Vol. 3, No. 6]

Migration is a concern for RST areas of Canada as rural development is essentially a demographic phenomenon. In terms of net migration, RST areas were net losers of youth (under 25 years of age) but net gainers of individuals in all age classes from 25 to 69 years of age. Thus, RST areas appeared competitive in attracting migrants in all age classes from 25 to 69 years of age.

Patterns of migration into and out of rural and small town Canada were similar to the patterns reported in the United States. In the 1970s, there was a turnaround of the long-standing pattern of rural net out-migration. This was due to both higher in-migration and lower out-migration. In the 1980s, we also saw the turnaround of the turnaround where the pattern of rural net out-migration returned, caused by lower in-migration. In the early 1990s, there was a return to the pattern of the 1970s, namely, rural NET in-migration, but this time due solely to higher RST retention (lower out-migration).

Young adults were the most mobile during the study period. Those aged 20-24 had the highest rates of RST out-migration while those aged 25-29 had the highest rates of RST in-migration. In terms of net migration, RST areas were net losers of youth but net gainers of individuals aged 25-69. RST areas were therefore competitive in attracting migrants of all age classes from 25 to 69 years of age.

Rural youth migration [Vol. 2, No. 3]

By comparing the population structure for RST areas in 1996 to the overall Canadian population structure, one sees that the RST population has a smaller proportion of individuals who are 20 to 24 and 25 to 29 years of age. Is this due to migration? Will these individuals return to RST areas?

How many young adults should we expect to find in RST areas? To investigate this, this bulletin calculated an expected 1996 population pyramid using the 1971 population structure (adjusted for expected deaths) and then compared this to the actual 1996 population pyramid. A 25-year period was used to allow the youth to leave for education and to return to a rural area. All provinces lost youth from their rural areas between 1971 and 1996. There was a (net) exodus over this time period.

Population structure and change [Vol. 2, No. 2]

In 1981, 33.6% of Canadians lived in predominantly rural regions. By 1996, this share had fallen to 31.4%. However, within predominantly rural regions, rural metro-adjacent regions are growing the fastest. These regions represent one-half of the population in predominantly rural regions. Net migration is strongest toward rural metro-adjacent regions.

The rural population continues to concentrate in regions near cities. Between 1981 and 1996, the predominantly rural population increased in absolute terms by almost 11% (see Focus Figure V.1). Most of this increase occurred in rural metro adjacent regions, which increased by almost 17%. The next largest rural population increase was 7% in the rural northern regions. Rural non-metro adjacent regions had the smallest gains in population. These results compare with the predominantly urban and intermediate regions which had higher growth rates of approximately 22% each.

Rural and small town population is growing in the 1990s [Vol. 1, No. 1]

Overall, Canada's RST population has grown in each intercensal period since 1976. However, the share of Canada's population living in rural and small town areas has declined from 34% in 1976 to 22% in 1996. There are two reasons for this. First, population growth has been higher in larger urban centres. Second, some rural areas are reclassified into "larger urban centres" in each census – both because commuting patterns change which causes the rural community to be classified within the commuting zone of the "larger urban centre" or the rural community grows past the threshold of 10,000 persons in the urban core. In this bulletin, the 5-year growth rates were calculated within constant boundaries but, invariably, each 5-year period started with fewer rural people due to this reclassification.

Rural and small town growth rates vary widely among the provinces. Much of the growth within rural and small town areas is in the small towns. Sub-provincial data show wide regional differences within each province.

Immigrants [Vol.5, No. 4]

Few immigrants reside in predominantly rural regions. In 2001, 28% of the population in predominantly urban regions was made up of immigrants (e.g. residents born outside Canada). The corresponding share for predominantly rural regions was only 6%. For Canada as a whole, immigrants had the same proportion with high school degree as the total population. In rural regions, on the other hand, immigrants were markedly more educated than the Canadian-born.

Immigrants in rural Canada – preference for urban regions [Vol.4, No. 2]

Immigrants tend to prefer urban regions. In 1996, 17% of Canada's total population were immigrants and 88% of them lived in urban regions. There they made up 27% of the population compared with only 6% of the population in the predominantly rural regions. Another interesting result is that, within predominantly rural regions, immigrants had a higher level of educational compared with the Canadian-born.

Within predominantly rural regions, immigrants who arrived before 1981 had a higher employment rate and higher incomes than the Canadian-born population. Those immigrants who arrive after 1981 had the opposite result.

(ii) Employment and labour force issues

Seasonal variation in rural employment [Vol. 3, No. 8]

Within each industrial sector (except agriculture), the RST workforce exhibited a higher amplitude of seasonality than the workforce in larger urban centres (LUCs), over the 1996 to 2000 period.

After accounting for the national average amplitude of seasonality and after accounting for the intensity of rural employment in highly seasonal sectors (such as "primary sector other than agriculture" and "construction"), we calculated that 39% of the employment seasonality in RST areas is due to the unique aspects of working in those areas. Higher rural seasonality may be due to the fact that RST industries, such as processing and transportation, have stronger links to primary commodity flows.

Employment structure up to 2000 [Vol. 3, No. 4]

Between 1987 and 1994 RST employment grew almost 6% while LUC employment grew nearly 8%. This growth in RST areas was fairly steady with the exception of 1990-91 when there was an overall decline in employment due to the economic recession. Between 1996 and 2000, while both the labour force participation rate and the employment rate in RST areas remained lower than in LUCs, growth was similar in both regions at just over 5% (Focus Table V.1).

The unemployment rates for RST areas and LUCs declined between 1996 and 2000, but the rate of reduction was slightly less in RST areas.

RST areas had lower labour force participation rates than LUCs for both youth and the general population (see Focus Figure V.2). However, up until 1999 the respective gaps closed. Between 1999 and 2000 the rate for youth and the general population declined in RST areas but continued a steady rise in LUCs.

While there was a general rising trend in the employment rates for the same population groups throughout, there was a large percentage difference between lower rates in RST areas and higher rates in LUCs. There was also a contrast between youth and the general population for each area, with youth having lower employment rates.

There was a smaller discrepancy in unemployment rates between RST areas and LUCs for the two populations than was evident in either the labour force participation or the employment rates. However, both youth and the general population exhibited a steeper decline in the unemployment rate in LUCs (see Focus Figure V.2). There was a marked difference in rates between youth and the general population in both areas, with youth averaging more than 5 percentage points higher than the respective general population.

When examining male and female youth in RST areas and LUCs the following results were obtained. Females had a lower rate of labour force participation than males. The male rates showed little difference between RST areas and LUCs, but the female rates were lower in RST areas. The male rates showed little difference between RST areas and LUCs, but the female rates exhibited a large discrepancy. Female RST labour force participation averaged 5 percentage points below that in LUCs.

Males in both RST areas and LUCs, and females in LUCs, had similar employment rates. However, females in RST areas had lower rates, averaging approximately 5 percentage points below the other groups.

While all the unemployment rates are high (averaging nearly 15%), after 1997 there was a downward trend for all the groups. This decline was steepest for male youth in LUCs. In both RST areas and LUCs, female youth had lower unemployment rates than the respective male population.

At the Canada level, it was seen that both the labour force participation rate and the employment rate in the RST areas were consistently below that of the LUCs. However, the RST areas were matching the LUCs in terms of the increase in employment rates over the five years. Both the RST areas and the LUCs had declining unemployment rates but the reduction was slightly less in the RST areas.

RST and LUC employment patterns of youth and the general population, split between males and females, were also examined. It was found that RST areas had lower labour force participation rates and employment rates and higher unemployment rates. However, the discrepancy with LUCs was relatively smaller for unemployment rates. Youth exhibited lower labour force participation and employment rates and higher unemployment rates than the general population. The variance between youth and the general population was particularly apparent in the unemployment rates with youth averaging 5 percentage points higher. For both youth and the general population the unemployment rate was declining faster in LUCs.

Looking specifically at male and female youth in RST areas and LUCs, females had generally lower labour force participation rates. This is particularly marked in RST areas. A similar pattern is seen in employment rates, with RST females having markedly lower rates than the other groups. However, the LUC female rate was closer to the male employment rates than was apparent in the labour force participation rate. Interestingly, although female youth had relatively less attachment to the labour force (e.g. lower employment rates and lower labour force participation rates), female youth (in both RST areas and LUCs) had lower unemployment rates than either male group.

Employment structure [Vol. 2, No. 6]

In Canada in 1996, residents of predominantly rural regions contributed about 29% of total employment. This share has been essentially constant since 1981. Among the types of rural regions, rural metro adjacent regions contribute 15%, rural non-metro adjacent regions contribute 12% and rural northern regions contribute 2%. All these shares remained essentially constant over the 1981 to 1996 period.

Looking specifically at the 1991 to 1996 period, the rate of employment growth in each type of rural region was higher than the employment growth in predominantly urban and intermediate regions. Within predominantly rural regions, rural metro adjacent regions showed the strongest rate of employment growth in each inter censal period - however, some of the employment growth of these regions is due to an increasing number of residents commuting to jobs in urban centres.

Other results

- The retail and wholesale trade sector is the biggest sector for employment in RST Canada and ranks as one of the top two sectors in each province.
- Manufacturing is also a top sector for employment in RST Canada.
- Only regions which are adjacent to major metropolitan centres reported employment growth above the Canadian average in each five year period since 1981.
- One-half of the regions that reported below average employment growth for three consecutive periods were rural regions not adjacent to a metropolitan centre. The lack of access to a metropolitan centre appears to constrain employment growth.

Employment structure in the primary sector [Vol. 2, No. 7]

Today, less than 3% of the workforce has an agricultural occupation and less than 3% of the population live on a census farm. Furthermore, employment in rural metro adjacent regions and in rural non-metro adjacent regions remains 2.5 times more intensive in the agriculture industry, compared to the national average. This level of relative intensity has remained essentially the same over the 1981 to 1996 period because, within each type of region, employment grew or declined at essentially the same rate.

Agricultural employment showed modest growth in the 1981 to 1986 period in each type of region. Growth continued in the predominantly urban regions in the 1986 to 1991 period, due in part to continuing growth in demand for nursery and greenhouse products in the vicinity of cities. However, all types of regions experienced a decline in agricultural employment in the 1991 to 1996 period. This decline is driven, in general, by the on going substitution of machinery for labour in agricultural production. Since rural metro adjacent regions and rural non metro adjacent regions are the most agricultural intensive in terms of employment, this across the board decline in the level of employment was felt most strongly in these rural regions.

Employment structure in the manufacturing sector [Vol. 2, No. 8]

Historically, manufacturing activity in Canada has been concentrated in larger cities. However, during the 1980s and 1990s, predominantly rural regions were relatively more intensive in "traditional" manufacturing relative to the overall economy. Each type of predominantly rural region appears 10% to 40% more intensive in traditional manufacturing than Canada as a whole. This relative intensity in traditional manufacturing constrained rural employment growth throughout the 1980s - because each type of region experienced a decline in traditional manufacturing employment from 1981 to 1986 and from 1986 to 1991. Employment levels essentially stabilised in the 1991 to 1996 (post recession) period. There were small gains in some regions and small losses in other regions.

In the 1981 to 1996 period, predominantly rural regions were relatively less intensive in complex manufacturing employment, with an intensity 60% to 70% of that of the country as a whole. During the 1980s, the intensity for predominantly rural complex manufacturing increased because its employment declined at a slower pace than the fall

in urban complex manufacturing employment. In the 1991 to 1996 period, each type of predominantly rural region reported gains in employment in complex manufacturing whereas predominantly urban and intermediate regions showed only small changes.

Employment patterns in the non-metro workforce [Vol. 1, No. 2]

The growth and decline of non-metro employment varied according to provincial economic activities. For all provinces, except the Prairie provinces, non-metro unemployment rates were generally higher than metro unemployment rates.

Non-metro unemployment rates were less sensitive to economic fluctuations. In a recession, the rise in the unemployment rate was slower in non-metro areas. In economic expansions, the fall in the non-metro unemployment rate was slower.

Employment rates (employment/population ratios) were lower in non-metro labour markets. Generally, the following employment tendencies were observed:

- Leading into recessions, non metro employment grew less rapidly than metro employment;
- During recessions, employment declined less in non metro areas than in metro centres;
- During economic recoveries, employment growth was higher in non metro areas than in metro centres;
- During economic expansions, metro employment growth overtook non metro employment growth.

Self-employment activity [Vol.5, No. 5]

Rural self-employment workers represented 37% of all self-employed workers in Canada in 2001 compared to a population share of 27%. The self-employment activity rate of workers in rural areas outside the commuting range of larger urban centres was more than double the urban rate in 2001[2]. However, the rural/urban differences in self-employment activity rates are much smaller when farming is excluded. Since the middle of 1990s, the number of rural workers engaged in non-farm self-employment has surpassed the number of farm self-employment workers.

Employment in agri-food industry by type of region [Vol.4.No.8]

Employment in agriculture and the agri-food industry remained at 15% of the total employment over the 1981-1996 period[3]. While employment in agriculture has fallen, the agri-food industry has grown faster than the overall economy (Figure IV.7.3).

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[2]The self-employment activity rate is a wider concept than the self-employment rate because it includes also all employees earning unincorporated self-employment income outside their main job.

[3]*Agriculture* includes primary agriculture and agricultural services.
Agri-food includes food processing, agriculture and food products wholesale and retail trade (including equipment and inputs) and food and beverages services.
Employment, which actually should be understood as number of persons engaged, includes paid workers, self-employed workers and unpaid family workers.
Data are available for 1981, 1986, 1991 and 1996. Predominantly rural regions are further broken down into rural metro-adjacent regions, rural non-metro-adjacent regions and rural northern regions.

Employment in agri-food is more than three times the level of employment in agriculture. Primary agriculture saw a decline in employment between 1991 and 1996 while in agricultural services it has grown continuously since 1981. Most employment in the agri-food sector is in the food and beverage service sector and the wholesale/retail trade of agriculture and food products.

Predominantly rural areas are 30% more intensive in agriculture and agri-food employment than the Canadian average. In agriculture employment alone predominantly rural areas are 2.3 times as intensive as the Canadian average but the intensity has been declining over the years (see Focus Figure V.3).

Part time employment in rural Canada [Vol.4, No. 1]

RST areas have a significantly higher incidence of part time employment than LUCs (see Focus Figure V.4). In 1999, it amounted to 15.6 in the former areas and 12.8% in LUC. Following the recession in the early 1990s part time employment increased in both types of areas. It is interesting to note the close correlation between the two series. The predominately rural areas rural provinces have the highest incidence of part-time employment in their rural areas.

In 1987-1997, the average annual growth in part time employment was 0.1% in RST while it reached 4.6% in the LUC. As for full time employment, the RST did even worse - it fell 1.1% per year against 2.4% growth in LUC. This picture changed radically in 1997-1999. Part time employment surged by 3.1% per year in RST whereas it fell 0.3% in LUC. Full time employment increased by 3.1% per year in RST while it rose by 2.9% in LUC.

Occupational pattern [Vol.5, No. 6]

Predominantly rural regions have a higher concentration of unskilled occupations, within most industries, compared to predominantly urban regions (see Focus Figure V.5). Moreover, during the 1990s, predominantly rural regions tended to become more intensive in unskilled occupations within most industries.

(iii) Income and expenditures

Rural – urban income divide [Vol.4, No. 4]

Between 1992 and 1999, territorial income disparity in Canada increased. However, between-province income disparity decreased while within-province disparity increased substantially. The average provincial income is less relevant in explaining the increasing spatial disparity. Disparities between various (OECD) types of regions became more important. Although the changes are not dramatic the geography of income disparities is shifting slowly but steadily from a provincial to a rural - urban divide.

Rural and urban household expenditure patterns for 1996 [Vol. 1, No. 4]

Main conclusions are that:

- Rural and urban households spend the same share of their budget on the necessities of food, clothing and shelter but rural households spend more on food and less on shelter.

- Distance influences rural household expenditure patterns. Rural households spend a higher share on transportation and a lower share on some services (e.g. cablevision, Internet), which are more difficult to access.

In 1996, the total expenditure of an average Canadian household was $49,054. Rural households spent an average of $42,620 while urban households had an average spending of $50,283.

In 1996, rural households spent 13% of their total budgets on food, while urban households spent 12% (see Focus Table V.2). This difference could be attributed to the fact that the average household size is moderately larger in rural areas (2.75 persons) than in urban areas (2.58 persons).

Both rural and urban households spent about the same share of their total budgets on clothing in 1996 (4.3%).

In 1996, households in rural areas spent an average of $6,705 on shelter (16% of their household budgets), while urban households spent an average of $8,800 (17%). A larger proportion of rural households owned their homes (82%) than urban households (64%). In addition, a larger share of rural homeowners (56%) has no mortgage payments compared to urban homeowners (45%).

Rural households spent an average of $6,328 on transportation in 1996, 15% of their total expenditure, while urban households spent $5,990, just 12% of their total expenditure.

Access to recreation services may be more limited in rural areas. In 1996, only 85% of rural households reported spending on recreation services, compared to 94% of urban households. On average, rural households spent $547 on recreation services, while urban households spent $1,033. Rural households spent, on average, $29 going to the movies compared to $63 for urban households. Compared to urban households, rural households spent more on tobacco (the average across all rural households was $619 and the average across all urban households was $512).

Measuring income and well-being [Vol. 2, No. 5]

Incomes are lower in rural areas. For the past three decades, rural families have had the lowest average incomes and the most urban areas (100,000 or more) have had the highest incomes.

In 1997, the average income for families living in rural areas was $48,850 while in areas with a population of 100,000 or more, the average family income was $59,920 (in constant 1996 dollars).

The income gap between rural areas and smaller urban centres has been falling the most, when we compare rural incomes to the incomes in each urbanisation class. Since 1990, the average income gap between rural areas and cities under 15,000 population fell by 58%. Even against the 100,000 and over urbanisation class, the rural urban income gap has fallen by 20%. By 1997, the average income for a rural family was only $359 below that of a family living in an urban area with a population less than 30,000.

Through the 1990s, within each community size, the proportion of families with low income has not fluctuated significantly. The proportion of families with income below the LICO[4] is lower in rural areas. For families living in rural areas, the proportion with low income remained at slightly below 10% while for those living in areas with a population of 500,000 and over, the rates ranged from 16% to 18%.

This is an indicator that rural communities are better off than urban communities in the sense that a lower proportion of their residents are restrained in the relative ability to purchase necessities.

Through the 1990s, like the low income rates based on LICO, the incidence of low-income rate based on LIM have not fluctuated significantly within each community size[5]. However, across different community sizes, LIM rates have exhibited the opposite pattern of LICO rates. Unlike LICO rates, LIM rates are highest for rural families while families in the most populous areas (500,000 and over) have the lowest proportion of families with income less than the LIM. LIM rates for families living in rural areas were approximately 15% while for those living in areas with a population of 500,000 and over, approximately 12% have incomes below LIM.

The average person in rural and small urban areas receives more social transfers per dollar of income and pays less tax per dollar of income than the average urban person. On average, rural and small urban area individuals tend to receive relatively more transfers because:

- Their unemployment rates are higher;
- There is a higher proportion of children (and thus residents receive more from the child tax credit); and
- There is a higher proportion of retired people who receive Canada and Quebec Pension Plan benefits.

Rural income disparities [Vol. 3, No. 7]

Within each province, incomes in rural regions are lower than the incomes in urban regions. Provinces with above average urban incomes (e.g. Ontario, Alberta and British Columbia) also have above average incomes in their rural regions.

The share of the rural population with low incomes has declined, relative to the share of urban population with low incomes (due largely to an increase in the incidence of low incomes in urban regions).

Thus, rural income disparities are decreasing within most provinces because the rural urban income gap is decreasing; and the incidence of low incomes in rural regions is declining, relatively.

[4]LICO (low income cut-offs) are established each year with an adjustment for family size and an adjustment for the urbanization class (see Cotton, 2001).

[5]LIM (Low Income Measure) equals one-half of the national median income, adjusted for family size and urbanization class.

(iv) Social issues

A rural-urban comparison of health indicators [Vol.4.No.6]

A lower proportion of Canadians living in small town regions (non-metro-adjacent), rural regions and northern regions rated their health as "excellent," compared to the national average (see Focus Table V.3).

Health risk factors that are more prevalent in the non-metropolitan region population included being overweight and smoking, (see Focus Table V.3). Arthritis/rheumatism was higher than the national average in rural (non-metro-adjacent) regions even after adjusting for age.

Health status and behaviours of Canada's youth: a rural-urban comparison [Vol.5, No. 3]

Studies have indicated that the health status of Canadians living in the most rural and remote parts of Canada is lagging behind that of urban areas. To some degree this is a result of demographic differences. However, analysis of the health of well-being of youth (aged 12-17) points to the same result. While 33% of girls in major metro regions rated their health as excellent, only 17% of girls in rural regions and 15% in northern regions rated their health at this level. Some 23% of boys in northern regions rated their health as excellent compared to 36% in major metro regions.

Boys located in small town regions had the highest prevalence of being overweight and obese. Boys in small metro regions had the highest prevalence of heavy drinking. Girls and boys in the northern regions are generally more likely to smoke. Within each type of region, girls are more likely to be smokers than boys. Physical inactivity is generally the same among youth across metro and non-metro regions. Previous studies had shown that physical activity for the population as a whole was more likely in rural areas.

How far to the nearest physician? [Vol. 1, No. 5]

In 1993, there were only half as many physicians per 1,000 population in RST Canada as in larger urban centres. However, two thirds of RST Canadians lived within 5 km of a physician. About 7% lived more than 25 km from a physician. In northern remote communities, over two thirds of the population lived more than 100 km from a physician.

Housing conditions [Vol. 2, No. 4]

Households are considered to be "below standard" if their dwellings do not meet one or more of three predetermined standards. The three standards are the suitability, adequacy, and affordability norms:

- The **suitability** norm – a suitable dwelling has enough bedrooms for the size and make up of the occupying household.
- The **adequacy** norm – an adequate dwelling does not, according to its residents, require major repairs.
- The **affordability** norm – shelter costs must consume less than 30% of before tax household income.

In 1996, predominantly rural regions had the lowest proportion of households with housing below standards (31%). Within rural regions there was little variation in the proportion of households with housing below standard. Rural northern regions had the highest proportion (33%), while rural metro-adjacent and rural non–metro-adjacent areas had the lowest proportions (31%) below standard. In contrast, predominantly urban regions had the highest proportion of households that did not meet one (or more) of the three norms of suitability, adequacy or affordability (39%).

Similar patterns are seen provincially. Within each province, predominantly rural regions had a smaller proportion of households below standard than did urban regions.

Gender balance [Vol.4, No. 3]

Rural females were less active in the labour market compared to rural males and compared to urban females. They also had a lower share of full time work. Economic and business conditions were one of the major reasons why females undertook part-time work, which was not the case for rural males who worked part-time. Rural females worked less paid and unpaid overtime than urban females.

Household Internet and computer use [Vol.5, No. 1], [Vol. 3, No. 5], [Vol. 1, No. 7]

In 1989, 19.4% of Canadians had a computer at home, which increased to 33.2% in 1994. In 1997, the share of Canadian households with computers was 36.4%. At the same time, within RST areas, the share of individuals with a computer at home increased from 13.9% in 1989 to 22.5% in 1994. Fewer RST individuals use a computer at work, compared to individuals in larger urban centres.

In 2000, a lower share of RST individuals lived in a household with a computer, compared to their urban counterparts. Approximately one half of RST residents (48% of RST rural residents and 51% of RST small town residents) responded that they had a computer in the home compared to CMA residents (62%) and CA residents (55%).

The trend toward the adoption of computers within households is continuing. Between 1989 and 2000, the share of households with a computer has approximately tripled – and this trend exists for rural and urban Canadians. Nevertheless, rural RST areas continue to have a lower share of households with computers. The gap between RST and CMAs in terms of the proportion of households with computers was 13 percentage points in 2000 – the same as in 1994. Thus, rural households are still "lagging" behind in terms of computer ownership – the more rural the area, the lower the share of households owning a computer.

Overall, household Internet connectivity is lower in RST households than in urban. In 2000, over 45% of individuals in CMAs lived in a household with an Internet connection, compared to 30% of individuals in RST rural areas. The rate of growth of the proportion of households with an Internet connection is similar in metropolitan and non-metropolitan households. All areas are increasing their rate of adoption of Internet access but metro areas are maintaining a higher Internet adoption rate.

The use of the Internet has been perceived as a crucial medium for residents in rural and remote areas to reduce the costs of distance. Analysis have shown that within each age

class, for each level of educational level and within each income group, members of rural households were less likely to use the Internet compared to their urban counterparts. Canadian data show that rurality per se is still an independent constraint on Internet use. On the positive side, however, households outside the largest 15 metropolitan areas with children under 18 years of age are more likely to access the Internet compared to similar households within the largest 15 metropolitan areas.

(v) Business structures and economic growth issues

Economic diversification [Vol.4.No.7]

Rural non-metro-adjacent regions show the widest range in the level of economic diversification and specialization (measured by the Herfindahl Index of Concentration). However, within each type of region, diversification varies widely depending on its location within Canada.

The producer services sector [Vol.3, No. 1]

The producer services sector (finance & real estate and business services) is a growing sector. Although the employment in predominantly rural regions grew faster than in urban they still have a very low share of their employment in this sector. Predominantly urban regions are 20% more intensive in producer services compared to the national average while predominantly rural regions are only 60% as intensive.

The composition of business establishments in smaller and larger communities in Canada [Vol. 1, No. 3]

There was a large number of new business starts in both smaller and larger communities in the 1993 to 1996 period. Smaller communities have relatively more businesses and are more likely to have smaller businesses. Service industry businesses dominate in both smaller and larger communities

Producer service businesses have a relatively lower presence in smaller communities while distributive services, personal services and social services are almost equally spread across smaller and larger communities.

In Canada, while smaller communities had a population share of 35%, their business share was 38%. This contrasts with larger communities, which had a population share of 65% and a business share of only 62%.

In Canada, small businesses (with 4 employees or less) made up the overwhelming majority of total businesses in both smaller and larger communities in 1996. However, small businesses were relatively more prevalent in smaller communities. In smaller communities, almost 65% of the businesses had one to four employees and 82% had fewer than 10 employees. This contrasts with larger communities where 56% of the business had one to four employees and 74% had fewer than 10 employees.

Factors associated with local economic growth [Vol. 1, No. 6]

The main conclusions are that:

- A higher education level in a community provided only a weak boost to employment growth during the 1980s.
- Communities that were relatively specialised in primary sector employment and traditional manufacturing employment were relatively disadvantaged in the 1980s.
- The type of region in which a community was located had a substantial impact on the rate of local economic growth. Communities in regions influenced by metropolitan centres benefited relative to other communities.
- A higher unemployment rate in a community in 1981 did not indicate an excess supply of labour that would attract employers. In fact, wage rates grew less in these communities and thus these communities fell further behind during the 1980s.
- Communities with a higher share of population with low incomes experienced higher economic growth in the 1980s, relative to the average community. These communities were catching up to the average community during the 1980s.
- There was a wide variability in community growth patterns in the 1980s. Many communities achieved economic growth in spite of the factors identified here that constrained growth for the average community.

It should be noted that the correlation between measures of educational attainment in the community and measures of local economic growth is generally weak. A higher level of average years of schooling within a community was associated with a lower rate of growth of average hourly wage rates. Community aggregate earnings grew less in communities with a higher level of education because the lower growth in wages was not offset by the growth of employment and/or the growth of hours worked. Note however that communities with a higher than average number of years of schooling did report higher employment growth, compared to the average community.

Another measure of the community's human capacity was also considered - the share of the population with low educational attainment and the share with high educational attainment. The results indicate that both areas with a lower educational attainment and areas with higher education attainment were associated with a higher rate of growth of employment in the 1980s. Communities with low skilled workers (as indicated by a high share of individuals with a lower level of education) were able to attract jobs during the 1980s and were also able to increase their wage level during this period. Thus, communities with a higher share of population that had lower education levels had significant association with a higher growth in aggregate community earnings.

Studies in the United States (e.g. Killian and Parker, 1991) found no significant association between community employment growth and community education levels, if the industrial structure of employment and the type of region were taken into account. In this study, we have controlled for the industrial structure of employment and the type of region and we do obtain a positive (albeit weak) association between employment growth and education levels. Thus, during the 1980s, Canadian communities, but not communities in the United States, appeared to benefit from high community education levels. Employment specialisation in the primary sectors was associated with lower

growth in all measures of community development outcomes. Community specialisation in traditional manufacturing was significantly associated with lower employment growth and with lower growth in aggregate community earnings.

(vi) Educational issues

Rural and urban educational attainment

Education has a crucial role to play in community development. A better educated labour force can improve the community's capacity to attract or generate economic opportunities and to translate those opportunities into higher-valued employment. However, in some cases rural areas provide limited job opportunities for skilled workers. Education therefore provides lower return on investment and consequently individuals have lower incentives to continue their schooling unless they plan to migrate out of the rural area.

In aggregate terms, predominately rural regions have followed the educational shifts that have taken place in the country as a whole. However, predominately rural regions have not closed the gap in the structure of educational attainment. Measurements for 1981 and 1996 showed that the gap in educational attainment between urban and rural regions persisted, (see Focus Table V.4 and Focus Figure V.6). In fact the gap in average years of schooling has tended to widen. It should be noted, however, that part of the observed spatial differences is due to the economic and demographic differences among regions. Another important observation is that there are large variations within each type of region.

(vii) Territorial issues

Urban consumption of agriculture land

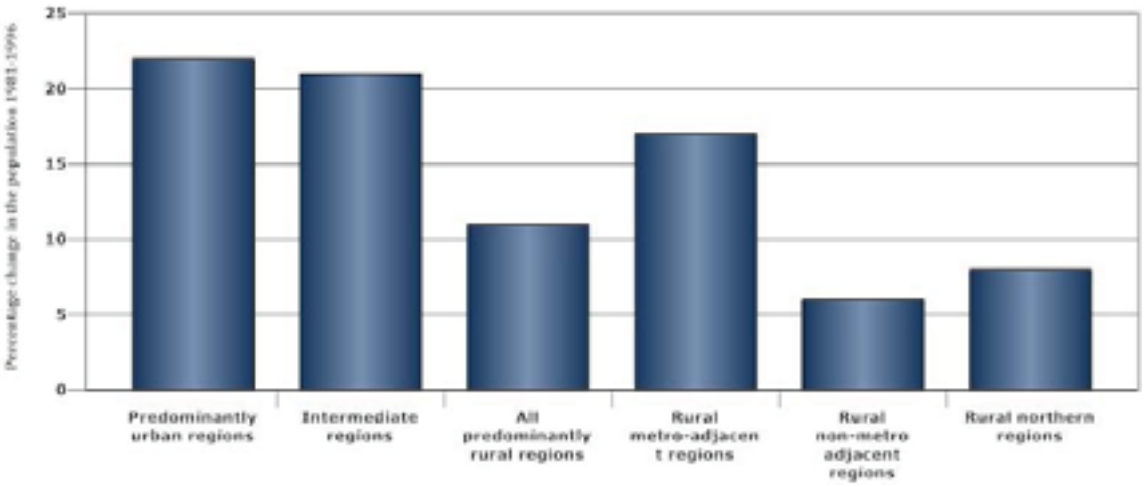
Of the total amount of land converted to urban uses in Canada between 1971 and 1996, about half, or 5,900 square kilometres, was "dependable" agricultural land. The urban consumption of agricultural land is partly due to the growing urban population and it is partly due to higher land consumption by each new urban dwelling.

Concluding remarks

The selection of results for Canada shown above gives a good illustration of how rural areas perform *vis-à-vis* urban areas in a large range of areas. It can certainly provide a good basis for policy decisions concerning rural development issues. However, for a complete picture, additional information could be added for the following areas:

- Land and typology issues, including amenities
- Recreation and tourism
- Communication infrastructure
- Cultural activities
- Crime rate
- Analysis of out-outliers: identification of successful and unsuccessful communes and areas and analysis of the factors behind the results.

FOCUS FIGURE V.1
Canada: Percentage population change by types of regions, 1981-1996



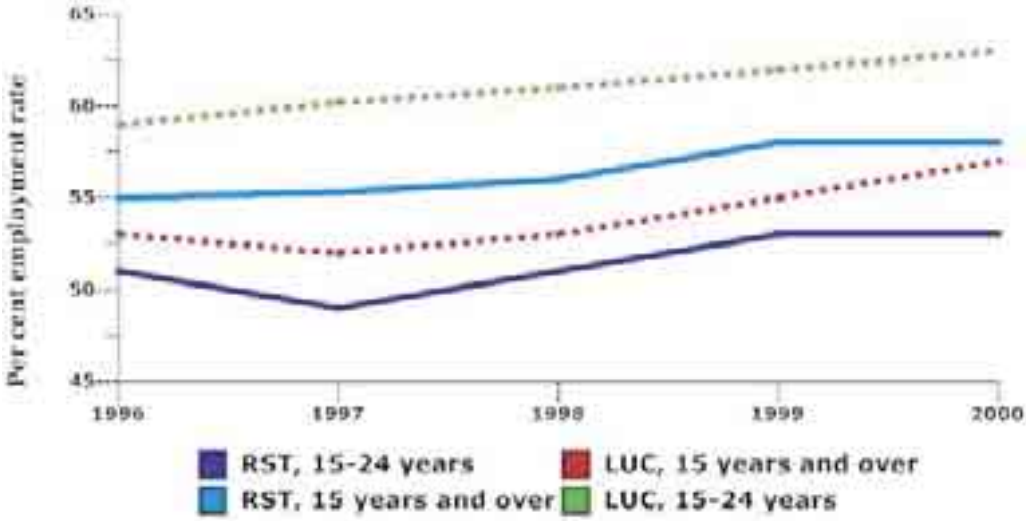
Source: *Rural and Small Town Canada Bulletin*, Vol. 2 No. 2

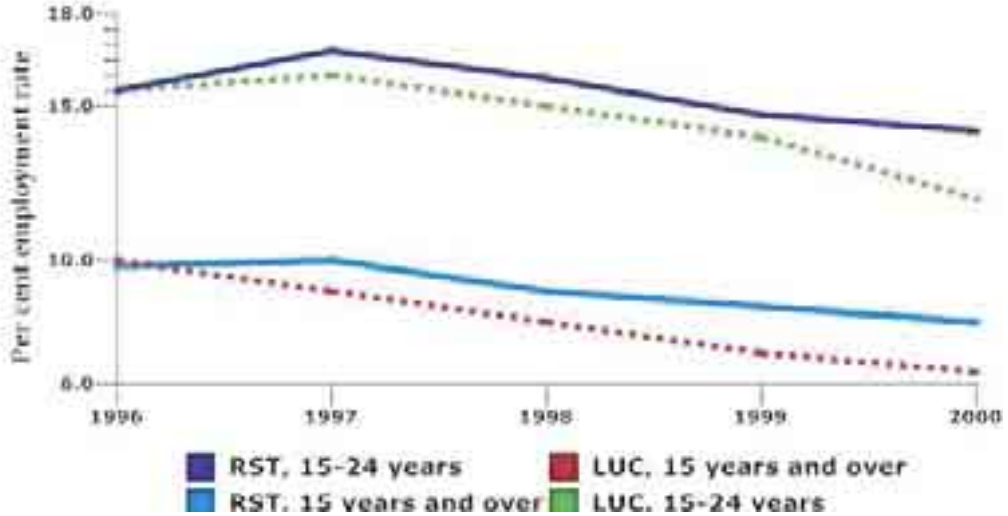
FOCUS TABLE V.1
Canada: Employment level and rate and unemployment rate in larger urban centres and rural and small town, 1996 and 2000

	1996	2000	% change
Employment level			
Larger urban centres	8,191,200	8,960,700	9.4
Rural and small town	1,913,100	2,104,200	10
Employment rate (per cent)			
Larger urban centres	76.8	80.7	
Rural and small town	73.4	77.1	
Difference	3.4	3.6	
Unemployment rate (per cent)			
Larger urban centres	8.6	5.4	
Rural and small town	9.1	7.2	
Difference	0.5	1.8	

Source: *Rural and Small Town Canada Bulletin*, Vol. 3, No. 4

FOCUS FIGURE V.2
Canada: Employment and unemployment rates by age groups and type of geographical area, 1996-2000 (RST = rural and small town areas; LUC = larger urban centres)





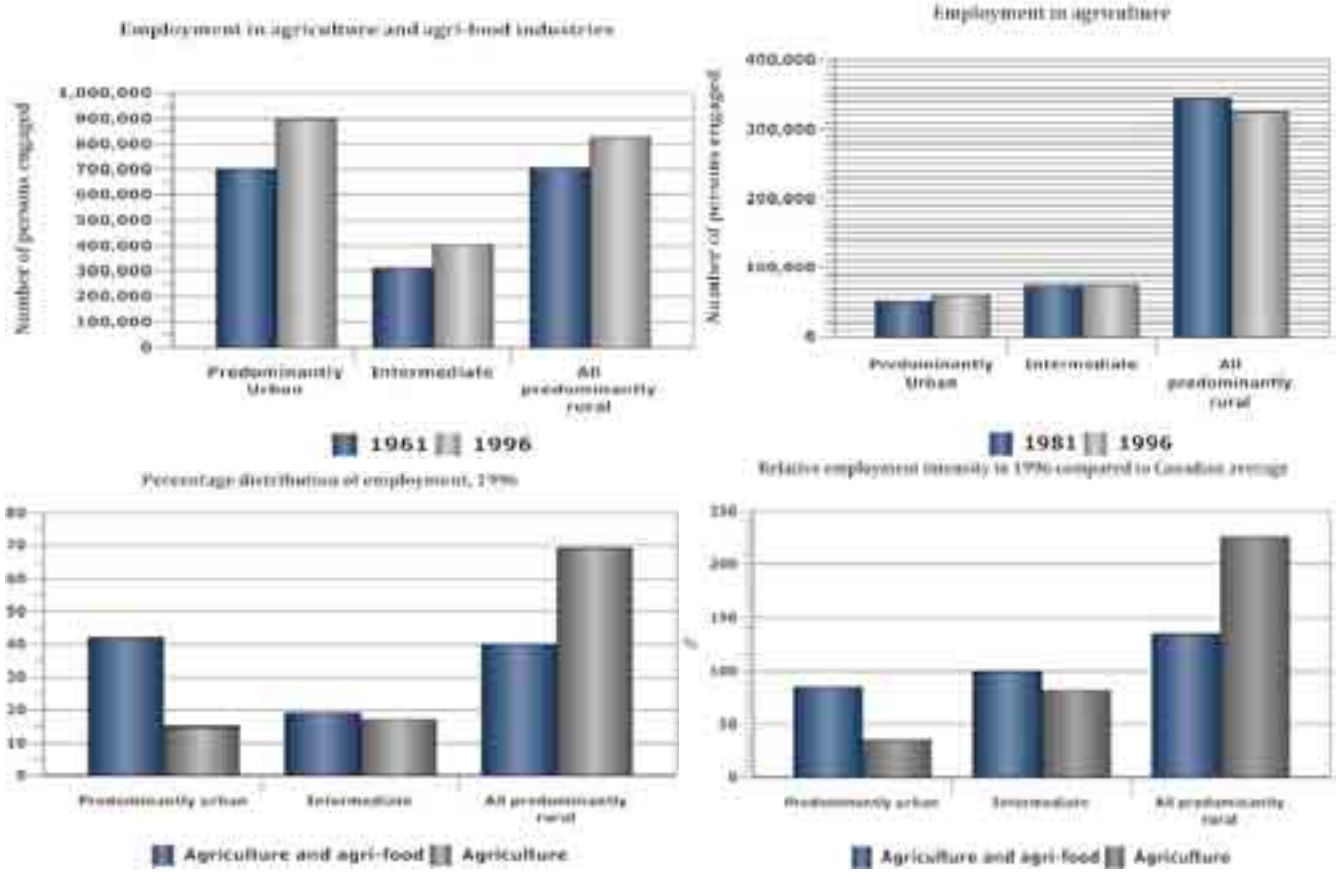
Source: *Rural and Small Town Canada*, Vol. 3, No. 4

FOCUS TABLE V.2
Canada: Household expenditures by expenditure categories in urban and rural areas, 1986 and 1996 (constant 1996 dollars)

	Urban		Rural	
	1986	1996	1986	1996
Per cent of total expenditure				
Food	14.1	11.9	15.4	13.4
Clothing	6.3	4.3	6.4	4.3
Shelter	16.5	17.5	14.2	15.7
Total	36.9	33.7	36.0	33.4
Expenditure in $ per household				
Private transportation	4,194	5,415	4,430	6,133
Public transportation	468	576	202	215
Total	4,662	5,990	4,632	6,328
Per cent of transportation expenditure				
Private transportation	90	90	96	97
Public transportation	10	10	4	3
Total	100	100	100	100
Expenditure per household in constant 1996 dollars				
Tobacco products and smoker's supply	734	512	795	619
Alcoholic beverages	927	627	750	562

Source: *Rural and Small Town Canada Bulletin*, Vol. 3, No. 4

FOCUS FIGURE V.3
Canada: Employment in agriculture and agri-food by type of regions



Source: *Statistics Canada, Rural and Town Canada Analysis Bulletin*, Vol.4, No.8.

FOCUS TABLE V.3
Canada: Selected health indicators by type of region

	Self-rated health (excellent)	Body mass index (overweight)	Smoking (daily/ occasionally)	Arthritis/ Rheumatism
Major metro (central)	**26.9**	**26.5**	**21.6**	**13.4**
Major metro (fringe)	**28.6**	32.8	27.5	14.0
Mid-sized metro	25.3	**32.7**	25.5	16.0
Small metro	**24.9**	35.4	**28.3**	**16.8**
Small city: metro adjacent	**25.8**	35.2	**29.4**	16.2
Small city: non-metro adjacent	**24.0**	**35.7**	26.7	16.4
Small town: metro adjacent	**24.5**	**36.8**	**29.1**	16.3
Small town: non-metro adjacent	21.9	**37.1**	**29.5**	**15.9**
Rural: metro adjacent	**19.3**	**45.3**	26.5	14.7
Rural: non-metro adjacent	**20.2**	**42.3**	**32.0**	**18.4**
Northern	**20.8**	**41.9**	**32.7**	16.1
Canada	**25.6**	**32.4**	**25.9**	**15.3**

Note: Bolded blue cells indicate significantly different than the national average

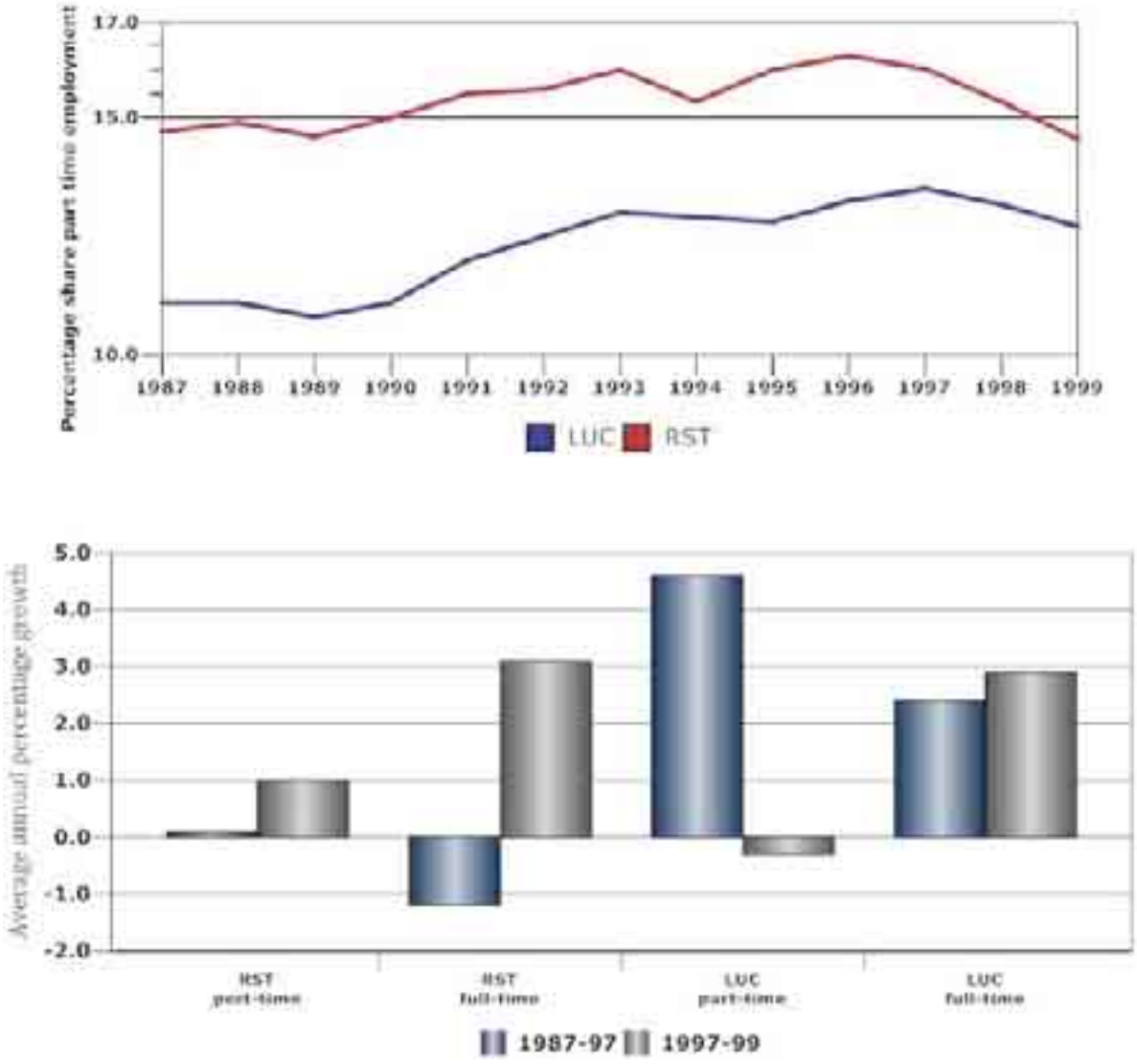
Source: *Statistics Canada, Rural and Small Town Canada Analysis Bulletin*, Vol. 4, No. 6

FOCUS TABLE V.4
Canada: Percentage distribution of population (25 to 54 years of age) by level of educational attainment

	Less than grade 9		Grade 9-13 (no certificate)		High school certificate (no post secondary)		Some secondary	
	1981	1996	1981	1996	1981	1996	1981	1996
Predominantly urban	14.7	5.5	22.4	17.2	13.4	14.6	49.6	62.8
Intermediate	16.9	5.5	26.1	21.1	14.2	16.5	42.9	56.9
Rural metro-adjacent	18.2	6.3	30.2	25.6	12.6	16.8	38.9	51.2
Rural non–metro-adjacent	23.1	9.5	29.4	27.5	12.3	15.8	35.2	47.1
Rural northern	24.6	11.7	27.6	26.6	10.2	12.7	37.5	49.0
Canada	17.0	6.3	25.4	20.7	13.2	15.4	44.4	57.6

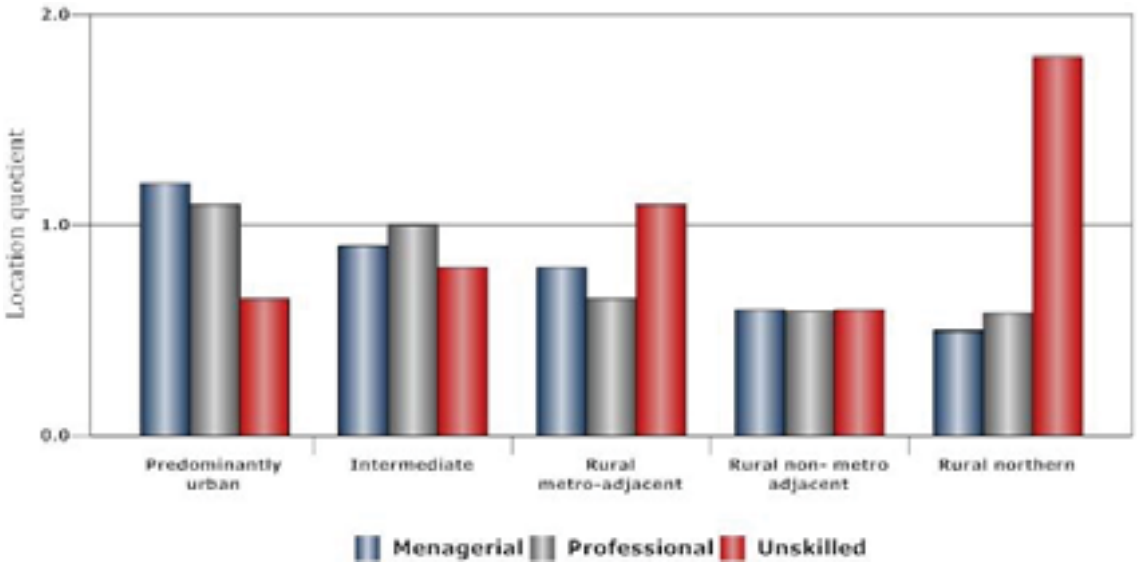
Source: *Statistics Canada, Rural and Small Town Canada Analysis Bulletin*, Vol. 4, No. 5

FOCUS FIGURE V.4
(a) Canada: Percentage share part time employment in RST and LUC in 1987-1999
(b) Canada: Annual average percentage change in part time and full employment in 19987-97 and 1997-99
(RST = Rural and Small Town Areas; LUC = Larger Urban Centres)



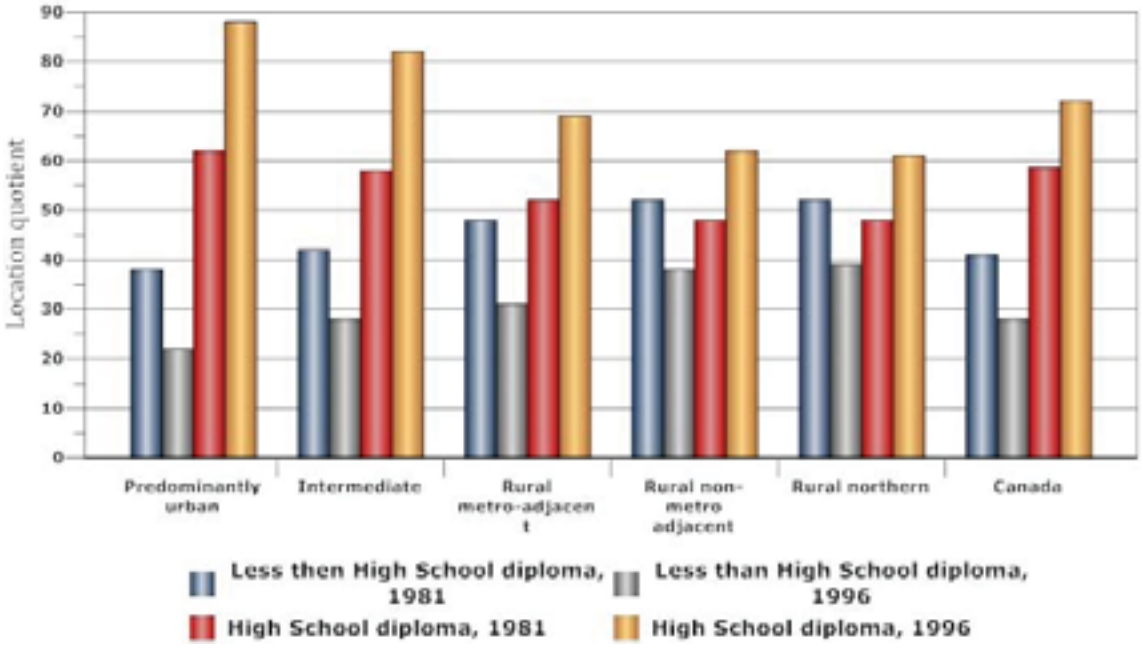
Source: *Statistics Canada, Rural and Small Town Canada Analysis Bulletin*, Vol. 4, No. 1

FOCUS FIGURE V.5
Canada: Intensity of occupation by type of occupation and region in 2001, expressed as a location quotient



Source: *Statistics Canada, Rural and Small Town Canada Analysis Bulletin*, Vol. 5, No. 8

FOCUS FIGURE V.6
Canada: Percentage distribution of population (25 to 54 years of age) by level of educational attainment



Source: *Statistics Canada, Rural and Small Town Canada Analysis Bulletin*, Vol. 4, No. 5

FOCUS PIECES

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Killian, M.S. & Parker, T.S. (1991). *Education and Local Employment Growth in a Changing Economy*. Chapter 4 in Education and Rural Economic Development: Strategies for the 1990s. United States Department of Agriculture, Economic Research Service, Report No. AGES-9153). Washington, D.C. pp.93-113.

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Focus on England: Case Study

Introduction

England's Department for Environment, Food and Rural Affairs (Defra) has taken a place-based – rather than land-use based – approach to rural policy since it published its Rural Strategy in 2004, with the aim of supporting "socially and economically sustainable rural communities". This it does by focusing on two components: one is the way that rural areas perform within mainstream policies that are the responsibility of other government departments, ranging from education and health to poverty and housing affordability areas. The second is to monitor the economic situation in rural areas, focussing on productivity but supported by a range of indicators from earnings and employment to investment and enterprise.

The ability to report regularly on what is happening in rural areas is made possible because of the link with the Office for National Statistics and its Neighbourhood Statistics System (NeSS), which contains detailed data for small geographical areas brought from a range of sources. Crucially, it is possible to label these small areas as being rural or urban and thereby draw comparisons.

The national system of Neighbourhood Statistics

Neighbourhood Statistics Service is a relatively recent development. It was developed by the ONS to accompany an initiative launched on 15 January 2001 by the Prime Minister under the title "***A New Commitment to Neighbourhood Renewal: A National Strategy Action Plan*".** It set out the Government's vision for narrowing the gap between deprived neighbourhoods and the rest of the country over some 10 to 20 years so that no-one should be seriously disadvantaged by where they live. The need for data for small areas that this policy implied stimulated the ONS to start to bring together data from several sources to form place-based information, initially using the local authority electoral ward (the smallest unit within local government) as the basic unit, though this was soon replaced by the smaller [population] Census Output Area when this became available following the 2001 Census.

The types of information deemed to be relevant fell into ten "domains"

- Access to services
- Community well-being / social environment
- Crime
- Economic deprivation
- Education, skills and training
- Health
- Housing
- Physical environment
- Work deprivation

In the period since the NSS was launched the catalogue of available indicators has expanded, Furthermore, they are now available at a range of geographical levels, though

data source limitations mean that not all can be supplied for the smallest units. In 2009 the spreadsheet showing the catalogue contained some 6,700 separate indicators at a hierarchy of levels that range from the whole country through regions, counties, local authority areas down to individual Census Output Areas. In addition other units not part of the hierarchy are also listed, including those used by health and education authorities.

Data are publicly available online, with requests being presented with a flexible range of options, involving both indicators and levels of geographical unit. In practice, the default smallest reporting unit (the one that is offered when a request is made for the location of a particular post-code) seems to be the Super Census Output Area, which approximates to a population unit of about 1,500 persons.

Important in the present context, Census Output Areas carry a flag as being rural or not using the new definition of rurality described in Section III.1.5 above. This acts as the basis for the system of rural statistics that is currently operated by Defra.

Defra's rural statistics for England – the methodology

The social and economic outcomes sought by the UK Government apply equally to all areas, both urban and rural. When the Government refers to "mainstreaming" rural policy it means that the policies and processes developed to deliver desired outcomes are designed effectively to meet the needs of people living throughout the country. It is about working constructively within a national policy framework which recognises that *all* communities are different; and which is increasingly designed to give local areas the flexibility to respond to local circumstances and needs. It is important in this context to distinguish between localised issues and concerns and evidence of any systemic challenges associated with rurality. Information is thus needed to assess the performance of government policies in rural areas by comparing outcomes and trends in rural areas to the national picture.

Defra, in order to meet its responsibilities (as shown in Defra's Departmental Strategic Objective) has selected a range of indicators that it currently monitors, reporting on a six-monthly basis. These are:

- Educational Attainment (school examination results, entrants to higher education)
- Social Capital/ Quality of Life (trust, belonging, community cohesion)
- Health (life expectancy, infant mortality and potential years of life lost for a range of disease)
- Housing (affordability, homelessness, delivery)
- Crime (a range of standard offences)
- Poverty and unemployment (unemployment rates and poverty)

Development of indicators for these has been guided by three key principles:

- The indicators should, wherever possible, focus on outcomes rather than inputs, outputs or processes,

- The outcomes in rural areas will be measured against the national picture,
- The indicators must be based on mainstream government data to access will be maintained over the period for which comparisons will be needed.

The last implies a heavy dependence on the ONS Neighbourhood Statistics System and the data that it contains for small areas.

In line with the definition of rurality described in Chapter III of this Handbook (which is used in England and Wales), areas are broken down into the various types for the purpose of analysing the levels of the various indicators:

- Urban > 10k - Less Sparse
- Urban >10k – Sparse
- Town & Fringe - Less Sparse
- Town and Fringe – Sparse
- Village - Less Sparse
- Village – Sparse
- Hamlet & Isolated Dwelling - Less Sparse
- Hamlet & Isolated Dwelling

In addition to reporting absolute figures, Defra also employs a "traffic light" labelling system to draw attention to whether trends indicate progress or deterioration. The colours are nuanced to indicate degrees of change.

- Green 1 and 2: An indicator where rural areas perform above or equal to the norm, with a trajectory suggesting that it will remain so.
- Green 3: An indicator that is below, but within an acceptable range of the norm with a trajectory that remains within an acceptable range.
- Amber/Green: An indicator where rural areas perform below an acceptable range of the norm, but with a converging trajectory that will converge within an acceptable time frame.
- Amber/Red 1: Rural areas performing equally to the norm, but trajectory will clearly take rural below the norm.
- Amber/Red 2: Indicator where rural performs below the norm with a converging trajectory that will converge outside an acceptable time-frame.
- Red 1 and 2: An indicator where rural areas perform below an acceptable range of the norm with either a parallel or diverging trajectory.

Results for rural areas in England

Overall, the evidence suggests that outcomes in the majority of rural areas are already relatively "strong" by comparison with the national average. Proportionately fewer of England's rural households are in poverty. Proportionally fewer rural people are victims of crime. Proportionally more people in rural areas are employed and fewer unemployed than in urban areas. Therefore the majority of indicators in this basket are green.

A more specific example is provided by indicators of **Educational Attainment.** Overall, people living in rural areas experience more positive educational outcomes when compared to the national average. One important indicators is the proportion of pupils achieving five or more A* to C grades by the end of key stage 4 in their education (typically by the age of 16 years). Results are shown in Focus Table V.5. A greater percentage of pupils in rural areas achieve this than in England as a whole. This indicator also shows an association with sparsity, with a higher proportion of pupils in less sparse areas achieving five or more A* to C grades than pupils in sparse areas. However, the proportion of pupils achieving 5 or more A*-C grades at GCSE has increased in all types of area since 2004/05.

FOCUS TABLE V.5

England: % of pupils at the end of Key Stage 4 achieving five or more Grades A*-C in the General Certificate of Secondary Education

Type of area	2004/05	2005/06	2006/07	2007/08
Urban > 10k - Less Sparse	53	55	58	63
Urban >10k - Sparse	49	54	53	62
Town & Fringe - Less Sparse	60	62	63	67
Town and Fringe – Sparse	56	55	58	62
Village - Less Sparse	65	67	68	72
Village – Sparse	60	64	63	68
Hamlet & Isolated Dwelling - Less Sparse	68	69	71	74
Hamlet & Isolated Dwelling – Sparse	67	67	69	75

However, the relatively good situation in these indicators for rural areas in England as a whole does not mean that at local level there are not wide divergences from the average, and it is important not to assume that all rural communities or rural people enjoy what appear to be significantly better outcomes. Consequently, this baseline information is not an end in itself but will help Defra prioritise activity to focus on those issues where there is greatest evidence of need. It will also provide the basis for a further programme of analysis and investigation; looking beneath the high-level information, exploring evidence gaps and outstanding questions and testing assumptions.

FOCUS PIECES

Website for England's rural statistics
http://archive.defra.gov.uk/evidence/statistics/rural/rural-definition.htm

Focus on the Framework of Agricultural and Rural Development Statistics in India[1]

Introduction

The synthesis of rural development issues necessitates study of an array of statistics and indicators ranging from demographic and its resource relationship, agriculture and rural socio economic features, rural economic diversification, inclusion and connectivity to the economic flows and institutional aspects. In the developing economies, the significance of these rurality factors is expected to be distinct due to the centrality of agriculture in their rural domain. Accordingly, the contours of rural development revolve around agrarian issues. The interplay of multitude of factors renders the rural domain very heterogeneous and complex. The profile of statistical indicators, therefore, also needs to focus on such distinctiveness and the factors attributing to accentuating rural urban disparities and intra rural disparities.

The statistical system in India has matured over the years to provide large number of statistical indicators generated through administrative records, census, household surveys and other statistical exercises which are generally harmonized with international standards. There still remain certain gaps in the statistical profile due to specific constraints (e.g. rural household income, rural diversification) and also due to constantly evolving data needs. It becomes a challenging task for the statistical system since the required data may not be readily available. It often needs the derivation of indicators from existing data and/or organizing specific surveys for requirements of rural policy formulation. The following paragraphs provide a brief on important sources of key statistics relating to agriculture and rural development. It can be seen that most of the indicators mentioned in the Wye City Handbook (2007) as primary indicators identified by World Conference on Agrarian Reforms and Rural Development (WCARRD) or outlined in "Global Strategy to Improve Agricultural and Rural Statistics" (UNESC-2010) as minimum set of core data are available through these sources.

Statistics on agriculture and rural development and their sources

India has a sound **agricultural statistical system** to provide a range of indicators. The profile of agricultural statistics is well defined and it revolves around land resources, land use, crop acreage, crop production and productivity, land holdings, inputs, irrigation etc. The main sources of agricultural statistics are:

- Established procedures of land records, and statistical surveys for states without land records, for land use, irrigation and seasonal crop acreage

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- General Crop Estimation Surveys (GCES), under which about 900,000 crop cutting experiments are conducted annually on 63 principal crops for yield estimates,
- The Agricultural Census for operational holdings and input use
- Livestock Census, and sample surveys for fisheries
- Other data sources on trade, fertilizers etc..

Comprehensive data can be seen in India's *Agricultural Statistics at a Glance* (http://dacnet.nic.in/eands/latest_2006.htm)

In respect of **rural development statistics**, though no system with this terminology exists, a vast array of statistical indicators gets generated through various statistical activities. It needs to be appreciated that the domain of rural development cuts across demography, socio-economic aspects, social and physical infrastructures and institutions. The indicators relating to them are from multiple sources.

The two most important sources of rural statistics are the (population) Census for demography and vital statistics, and National Sample Surveys for socio economic aspects. Besides these there are other sources such as the National Family Health Survey etc. to provide specific indicators. These are discussed below:

CENSUS

Agency: Office of Registrar General of India (http://www.censusindia.net/)

Census of India is the prime source of several demographic indicators, segregated for rural and urban sectors. The Census of India, 2001 was the 14th continuous and uninterrupted Indian census since 1872. The next Census is in 2011. The Census Act, 1948, forms the basis for the conduct of population censuses in independent India.

The statistics generated by the Census are available broken down into rural and urban areas. The lowest geographical unit for rural is the census village, and that for urban it is the census town. According to the 2001 Census, there are 638,596 villages, of which 593,731 are inhabited villages and remaining 44,865 are un-inhabited villages. It is to be noted that the village is also an administrative unit with a specified geographical area and land records, in which context it is termed a Revenue Village. Generally the Census and Revenue Villages are coterminous, barring exceptions. The significance of un-inhabited villages is in the context of revenue villages.

The key demographic indicators available through the Census are population (national and sub-national by age, sex, social groups, religion) population growth, mobility, birth rates, death rates, life expectancy, literacy indicators, worker's profile, housing conditions, amenities and important assets (The profile of Census Data is at annexure-1)

Vital statistics: Sample Registration System of Office of Registrar General of India

Registration of births and deaths is an important information source for demographic data for socio-economic development and population control in developing countries. The data

on population growth, fertility and mortality serve as the starting point for population projections. Apart from these vital indicators, an adequate evaluation of a number of programmes in the health sector, including family planning, maternal and reproductive health, immunization programmes, is dependent upon the availability of accurate, up-to-date fertility and mortality data. In India, registration of births and deaths started on a voluntary basis and there was no uniformity in statistical returns, resulting in both under-registration and incomplete coverage. In order to unify the civil registration activities, the Registration of Births & Deaths Act, 1969 was enacted. Despite having the registration of birth and death compulsory under this statute, the level of registration of births and deaths has continued to be far from satisfactory in several states/Union Territories (UTs). With a view to generating reliable and continuous data on these indicators, the Office of the Registrar General, India, initiated the scheme of sample registration of births and deaths in India, popularly known as the Sample Registration System (SRS) in 1964/65 on a pilot basis and on full scale from 1969/70. Since then the SRS has been providing data on a regular basis.

Rural Socio Economic Indicators through National Sample Survey (www.mospi.gov.in)

The National Sample Survey Office (NSSO) of the National Statistical Organization, Ministry of Statistics and Programme Implementation (MoSPI) is a premier organisation within the Government of India for carrying out multi-subject integrated sample surveys on varied subjects concerning the national economy and as required by different agencies of the Government, both Central and States. Its programmes for collection of data and generation of national and sub-national statistical indicators involves the development of survey design and instruments, setting out concepts and definitions, and processing, analysing and disseminating results.

NSSO socio economic surveys are nationwide, large-scale household/ enterprise surveys covering various subjects, including labour force (employment-unemployment), household consumer expenditure, informal enterprises in non-agricultural sectors, social consumption (health, education, hygiene, morbidity, disability), household land and livestock holdings, and household debt, investment and capital formation. These subjects are generally covered at the periodicity of every five/ten years. In addition, from time to time various other socio economic and agrarian subjects, as required, are also covered. The main subject coverage of NSS and corresponding indicators are given in Annex II of this section.

In the context of indicators mentioned in the “Global Strategy” and WCARRD, the following points may be noted:

1. There are limitations and constraints in deriving household income and its distribution over individuals as well as in the industry-occupation classifications. The estimation of household income requires assessment of financial flows in the matrix of individuals and the activities within the households. These financial flows may accrue from the waged work, imputations of non-wage work and flows from savings and stocks. When the household activities are unorganized, informal and overlapping (as is the case for farm related activities mixed with off-farm and non-farm activities), accounting for such flows is difficult during survey investigations. It

also needs to be appreciated that in such a complex ambit of financial flows, income derivations would need certain concepts and definitions. The survey cost, informant fatigue and qualitative aspects of data also pose constraints in data generation. For economic hierarchy and the distribution of households, NSS household consumer expenditure survey provides the indicator of Monthly Per Capita Consumer Expenditure (MPCE).

2. The MPCE is also the basis for assessing the prevalence of poverty and economic deprivation. The estimates of people living below the poverty threshold are worked out by the Planning Commission; a brief note on this is given in Annex III.
3. MPCE is considered to be a versatile indicator to anchor several other household socio-economic indicators.
4. The indicators and data on labour force participation are stabilized and standardized in the periodic labour force enquiry and provide incidence of Rural Non-Farm Employment and measurement of rural livelihood diversification.
5. Income of rural households appears to be most relevant for assessing rural livelihood diversification, though it is felt that it may require considerable effort to generate data for this purpose.

National Family Health Survey

The National Family Health Survey (NFHS) is a large-scale, multi-round survey conducted in a representative sample of households throughout India. Three rounds of the survey have been conducted since the first survey in 1992-93. The survey provides state and national information for India on fertility, infant and child mortality, the practice of family planning, maternal and child health, reproductive health, nutrition, anaemia, utilization and quality of health and family planning services. Each successive round of the NFHS has had two specific goals: a) to provide essential data on health and family welfare needed by the Ministry of Health and Family Welfare and other agencies for policy and programme purposes, and b) to provide information on important emerging health and family welfare issues (http://www.nfhsindia.org/).

Basic Statistics for Local Level Development

Census also facilitates in the respective District Census Handbook, the data on local level amenities such as Educational facilities, Medical Facilities**,** Drinking Water, Post, Telegraph and Telephone facilities, Communication, Credit Facility, Recreation and Cultural Facilities, Approach to Village, Power Supply, News and Magazines. With the advent of constitutionally enshrined grass root democratic institutions, Panchayati Raj Institution (PRI) in rural areas and Civic Bodies in urban areas, the Basic Statistics for Local Level Development has been given impetus. The pilots for the same have already being conducted with encouraging response (MoSPI-2010)[2].

[2] http://www.mospi.gov.in/9cocsso_paper_raj.pdf

FOCUS PIECES

Mehta, R. (2009). *Rural Livelihood Diversification and its Measurement Issues: Focus India. Second.* Second Wye City Group Meeting on Statistics on Rural Development and Agriculture Household Income, Rome (Link to paper).

ANNEX 1

Census of India 2001: Data Finder

http://www.censusindia.gov.in/Census_Data_2001/Census_data_finder/Census_Data_Finder.aspx

A)Series Tables: General Population Tables

Number of villages, urban agglomerations & towns ~ Area ~ Houses ~ Total Population ~ Rural Population ~ Urban Population ~ Scheduled Castes & Scheduled Tribes population ~ Primary Census Abstract ~ Slum population ~ Houseless population ~ Institutional population

B) Series Tables: Economic Tables

Workers (Main & marginal) ~ Industrial category of workers ~ Educational level ~ Main activity of marginal ~ Main activity of non workers ~ Seeking available for work

C) Series: Social and Cultural Tables

Population by religious communities ~ Age & marital status ~ Ever married & currently married population ~ Age at marriage ~ Literates & educational level ~ Attendance in educational institutions ~ Disabled population

D) Series: Migration Tables

Migrants by place of birth ~ Place of last residence ~ duration of residence ~ Intra district migration ~ Inter district migration ~ Inter state migration ~ International migration ~ Reason of migration ~ Age, marital status ~ Educational level of migrants ~ Economic activity of migrants

F) Series: Fertility Tables

Ever married women by present age, parity & total children ever born ~ Number of surviving children ~ Number of births last year ~ Birth order

HH) Series: Household Tables

Number of households ~ Household size ~ Male & Female headed households ~ Normal households ~ Houseless households ~ Institutional households ~ Households with aged persons ~ by religion

H) Series: Tables on Houses, Household Amenities and Assets

Number of census houses ~ Material of wall ~ Material of roof ~ Material of floor ~ Number of dwelling rooms ~ Source of drinking water ~ Source of lighting ~ Availability of bathroom ~ Type of latrine ~ Type of drainage ~ Fuel used for cooking ~ Availability of assets (like Radio/Transistor, television, telephone, bicycle, scooter, car etc.)

ANNEX II

Broad Subjects covered by NSSO and Indicators (www.mospi.gov.in)

- **Consumer Expenditure**:
  - Level, Pattern and distribution of Household Consumer Expenditure;
  - Nutritional Intake and distribution;
  - Commodity-wise Consumption;
  - Adequacy of Food;
  - Differences in Level of Consumption among Socio-Economic Groups;
  - Use of Energy and Durable Goods;
  - Consumption from Public Distribution System; etc.
- **Employment-Unemployment and Migration:**
  - Labour Force Parameters by Age, Sex, industry / occupation classification, , Sector and States;
  - Wages for rural / urban casual workers and wage paid employees (except self employed)
  - Employment / Unemployment Situation among Religious and Social groups;
  - Employment / Unemployment Situation in Cities and Towns;
  - Participation of Women in Household Work and other Specified Activities;
  - Non-Agricultural Workers in Informal Sector; etc.
  - Nature, Reason and other Aspects of Migration;
- **Household Wealth / Finance**:
  - Household Assets, Liabilities and Indebtedness (Institutional / non institutional);
  - Household Borrowings and Repayments;
  - Household Capital Expenditure;
- **Health, Hygiene and Housing condition:**
  - Morbidity and Treatment of Ailments;
  - Health Care and the Condition of the Aged;
  - Maternal and Child Health Care;
  - Profile of disabled Persons;
  - Housing condition, drinking water, sanitation and hygiene;

- Conditions of urban slums; etc.

- **Education:**
  - Literacy and Levels of Education;
  - Attending Educational Institution: Level, Nature, discontinuance
  - Expenditure on Education (64th Rd.)
  - Status of Education and Vocational Training;
  - Economic Activities and School Attendance by Children; etc.

- **Non Agricultural enterprises (Manufacturing, Trade, Services)** :
  - Operational and economic characteristics
  - Size, Employment, emoluments, value addition and other key estimates;
  - Assets and Borrowings of Enterprises;
  - **Informal Sector**

- **Land Holdings, Livestock Holdings and other agrarian issues:**
  - Household Ownership Holdings;
  - Seasonal Variation and Other Aspects;
  - Consumption by Farmer Households;
  - Access to Modern Technology for Farming;
  - Income, Expenditure and Productive Assets;
  - Some Aspects of Farming;
  - Cultivation of Selected Crops; Ownership of Livestock etc.

- **Others**:
  - Common Property Resources; Travel by Indian Households; Village facilities in India, Culture, Prices etc.

ANNEX III

Brief note on Existing Methodology of Poverty Calculation

The existing procedure[3] of official poverty calculation is done by the Planning Commission following the methodology recommended by the Expert Group (EG) headed by Late Prof. D.T. Lakdawala[4]. As per the existing methodology, to identify a norm for food expenditure, the EG recommended that the Poverty Line should be anchored to a calorie norm. A minimum of 2400 Kcal per person per day in rural areas and 2100 Kcal per person per day in urban areas may be used, as was previously recommended by the "Task Force on Projection of Minimum Needs and Effective Consumption Demand" (referred to as the "Task Force") under the chairmanship of Dr. Y. K. Alagh in 1979. The Task Force also recommended a Poverty line of Rs. 49.09 in rural and Rs. 56.64 in urban areas at all-India level at 1973-74 prices, using the 28th round (1973-74) of NSS Consumer Expenditure data. The EG recommended that these norms would be adopted uniformly in all States. The state-wise poverty lines for 1973-74 were calculated from these All-India poverty lines by applying Fisher Indices of State prices relative to All-India, reported by Chatterjee and Bhattacharya (1974)[5] for rural areas and Minhas *et al* (1988)[6] for urban areas. To obtain the state-specific poverty lines of future years, the state-specific poverty lines would be updated using of CPIAL for rural areas and CPIIW for urban.

For the calculation of income poverty, one needs (a) a distribution of households by size of per capita total expenditure (pcte), as is generated by quinquennial Consumer Expenditure Survey (CES) conducted by NSSO; (b) an exogenously specified poverty line; and (c) a price deflator to update the poverty line to the prevailing prices in the survey period(s) of CES. The distribution of households by size of per capita total expenditure is obtained from NSS Consumer Expenditure Survey (CES). The current poverty estimates are based on the 61st round (2004-05) CES data. However, in 2004-05 distribution of two MPCEs (viz., MPCE (URP) and MPCE (MRP)) were generated by NSS. Hence two poverty ratios, one using MPCE(URP) and the other using MPCE(MRP), were computed for each state and sector combination and presented by the Planning Commission. To compare with the 55th round (1999-2000) the poverty ratio of the 61st round (2004-05) based on MPCE (MRP) was used, since in 1999-2000 the NSS published MPCE using a Mixed recall period (MRP). Similarly, to compare with the poverty ratio of the 50th round (1993-94), MPCE (URP) was used, as the published report of NSS contained results MPCE (URP).

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[3]The Report of the Expert Group to Review the Methodology for Estimation of Poverty Chaired by Prof. S.D. Tendulkar has been submitted to Government of India.

[4]Report of the Expert Group on Estimation of Proportion and Number of Poor (1993).

[5]Chatterjee G S and N Bhattacharya (1974), "Between State Variations in Consumer Prices and Per Capita Household Consumption in Rural India", in T N Srinivasan and Pranab Bardhan (eds), *Poverty and Income Distribution in India*, Statistical Publishing Society, Calcutta.

[6]Minhas B S, L R Jain, S M Kansal and M R Saluja (1988), "Measurement of General Cost of Living for Urban India-All India and Different States", *Sarvekshana*.

Focus on Results of UNECE Survey on Methods Used for Measuring Rural Development Statistics in UNECE and OECD Member Countries

Rural Development Statistics Questionnaire
Question 1

Which organisation(s) is/are responsible for statistics on rural areas?	
Australia	Australian Bureau of Statistics (responsible for national statistics for all areas including rural areas); Australian Bureau of Agricultural and Resource Economics (ABARE), State Government agencies and some Industry Associations also collect statistics on various aspects of rural activity.
Bulgaria	National Statistical Institute; Ministry of Agriculture and Forestry
Canada	Statistics Canada; other federal agencies; provincial, territorial and local agencies;
Czech Republic	Czech Statistical Office (Agricultural and Environment, Family Accounts and Population Statistics)
Denmark	Statistics Denmark; Ministry of the Environment; Ministry of Food, Agriculture and Fisheries
Estonia	Statistical Office
Finland	Statistics Finland; Ministry of Agriculture and Forestry (joint Finnish Rural Indicators Project)
France	INSEE; Ministry of Agriculture, Food, Fisheries and Rural Affairs
Germany	Federal and Regional Statistical Offices
Hungary	Hungarian Central Statistical Office; Tax and Financial Control Administration; Research and Information Institute for Agricultural Economics; Institute for Geodesy, Cartography and Remote Sensing; Ministry of Agriculture and Rural Development
Ireland	Central Statistics Office Ireland
Italy	Instituto Nazionale di Economia Agraria/National Institute for Agricultural Economics (INEA), Instituto per Studi, Ricerche e Infomazioni sul Mercato Agricolo/Institute for Analysis, Research and Information on the Agricultural Market (ISMEA); Instituto Nazionale di Statistica/National Statistical Institute (ISTAT)
Kazakhstan	Agency of Statistics
Kyrgyzstan	National Statistical Committee of the Kyrgyz Republic
Latvia	Central Statistical Bureau of Latvia
Lithuania	Statistics Lithuania
Netherlands	Statistics Netherlands
Norway	Statistics Norway
Romania	National Institute of Statistics; Ministry of Development and Prognosis; Ministry of Agriculture, Food and Forestry; Ministry of Education and Research; Ministry of Health and of the Family; Life Quality Research Institute; Institute of Agrarian Economy
Russian Federation	Local statistical committees are responsible for statistics on rural areas. Local data are aggregated in regional, territorial and republican committees and in Goskomstat for the country as a whole.
Slovakia	Statistical Office of Slovakia
Sweden [1)]	National Rural Development Agency; Swedish Board of Agriculture
Switzerland	Swiss Federal Statistical Office (Agricultural Statistics Section, Spatial Data Section and Population Census)
Turkey	Regional Statistics Division of the State Institute of Statistics
United Kingdom	Defra and Devolved Departments responsible for Rural Affairs/Development; Office for National Statistics; Countryside Agency; Office of the Deputy Prime Minister; and others
United States	U.S. Census Bureau; Bureau of Labor Statistics; Bureau of Economic Analysis; Economic Research Service; National Agricultural Statistics Service

1) no official statistics for rural areas, thus no responsible organisation but some information provided by these organisations

Rural Development Statistics Questionnaire
Question 2

What variable(s) is/are used to distinguish rural from non-rural areas?	
Australia	Population density and population level; remoteness from services and goods
Bulgaria	Population density and population level in the biggest town of the municipalities
Canada	Population level and population density; population level and intensity of commuting to a major urban centre within a labour market radius; population density; population level
Czech Republic	Number of permanent residents in the municipality (population level)
Denmark	Population level of municipalities
Estonia	Administrative distribution; population level
Finland	Various i.e. Urban Network Study
France	Number of jobs and commuting pattern
Germany	Population level of urban centres and population density of surrounding areas of urban centres
Hungary	Population level and population density at settlement level
Ireland	Population level
Italy	Population density (no single official definition though)
Kazakhstan	Population level and share of population engaged in agriculture
Kyrgyzstan	The status of every settlement/village is defined by Jogurky-Kenesh - the Parliament of the Kyrgyz Republic
Latvia	In Latvia the rural area is the total land area excluding urban areas. Rural areas will be in the Draft Law on Agriculture and Rural Development which is not yet approved by the Cabinet of Ministers).
Lithuania	Population level, characteristics of towns
Netherlands	No official statistics to monitor rural policy yet. Discussions started with the Ministry of Agriculture, Nature and Food Quality on possible definitions. Possibly for different aims of rural development policy different definitions of rurality are appropriate.
Norway	At present there is no official definition of rural/non-rural in Norwegian statistics.However, Norway has a Standard Classification of Municipalities based on industry, population density and centrality.
Romania	The 'rural' status for a settlement is established by law without taking into account the demographic size or population density
Russian Federation	Various variables among others types of activities i.e. crop and livestock production
Slovakia	Population density and population level; municipalities that have no urban status and have got a characteristic settlement and economical structure based on agriculture, forestry and that have got less developed infrastructure.
Sweden	Population level of settlement
Switzerland	All the areas outside isolated towns and agglomerations are considered as rural (population level, commuting pattern, population growth rates, built-up area, population/job density and employment in the primary sector are used delimit agglomerations and isolated towns).
Turkey	Population level
United Kingdom	A variety of definitions, including one based on settlement size and one based on socio-economic variables
England	A variety of definitions, including one based on settlement size and one based on socio-economic variables
Scotland	Population density; settlement size
Wales	All rural except for a small list of communities in towns and cities that were deemed to be entirely non-rural; population density
Northern Ireland	n/a
United States	Population level of urban centre and commuting pattern; Population density

Note: for the United Kingdom a new definition was introduced after the UNECE survey to be used in England and Wales – see country example given in Chapter III.

Rural Development Statistics Questionnaire
Question 3

Are there any subdivisions of rural areas relating to the degree of rurality?	
Australia	No subdivision for rural area definition but subdivision of remoteness division (major cities, inner regional, outer regional, remote, very remote)
Bulgaria	See Annex C.
Canada	Yes, both major rural definitions currently used in Canada have subdivisions.
Czech Republic	Yes.
Denmark	No.
Estonia	No.
Finland	Yes.
France	Yes.
Germany	Yes.
Hungary	Yes.
Ireland	No.
Italy	No.
Kyrgyzstan	No (except high mountain rural population)
Latvia	No.
Lithuania	n/a
Netherlands	n/a
Norway	No official subdivision. However, rural areas may, for example, be classified according to level of centrality.
Romania	Yes.
Russian Federation	n/a
Slovakia	Yes.
Sweden	Yes.
Switzerland	No, not yet (but subdivision into agricultural, wooden and unproductive area)
Turkey	Yes.
United Kingdom	Yes.
England	Yes.
Scotland	Yes.
Wales	Division into severely disadvantaged, disadvantaged and other but this is not really related to the degree of rurality.
Northern Ireland	n/a
United States	Yes.

Rural Development Statistics Questionnaire
Question 4

What is the threshold value that classifies an area as rural?		
Australia	Rural/urban definition	There is not distinct threshold as such, since rural areas are defined at those areas other than Urban centre. Smaller Urban Centres are conglomerations with Census Collection Districts with a total population of 1,000 or more and containing a discernible urban pattern of population distribution such as formed streets, etc. Thus, an approximate threshold is 1,000 people.
	Remoteness definition	n/a
Bulgaria		Population density of less than 150 people per square kilometre and the biggest town of the municipality of less than 30,000 inhabitants.
Canada	OECD Definition	A region is defined as rural if 50 per cent or more of the population live in a community with less than 150 people per square kilometre.
	Rural and Small Town Methodology	Areas under 10,000 people outside the commuting zone of a Census Metropolitan Area and Census Agglomeration Area
Czech Republic		Less than 2,000 residents in the municipality
Denmark		Areas that are not urban (all villages of 200 and more inhabitants are defined as urban).
Estonia		2500 inhabitants
Finland		n/a
France		Settlements with less than 2,000 inhabitants
Germany		Regions with a population density of 100 inhabitants per square kilometre with an urban centre of 100,000 and more and regions with a population density of below 150 inhabitants per square kilometre without a urban centre of 100,000 or more.
Hungary	Narrow definition	Less than 120 inhabitants per square kilometre or under 10,000 residential population at settlement level.
	Broader definition	Predominantly rural at NUTS IV level if 50 per cent of residential population live in a settlement with a population density of under 120 inhabitants per square kilometre and significantly rural if 15 to 50 per cent live in a settlement with a population density of under 120 inhabitants per square kilometre.
Ireland		Outside clusters with a population of more than 1,500 inhabitants
Italy		100 inhabitants per square kilometre
Kazakhstan		A village with at least 50 people of which at least half is engaged in agriculture production
Kyrgyzstan		No threshold as rural is defined by the parliament.
Latvia		n/a
Lithuania		Small towns (population less than 3000) and villages (other residential areas having no characteristic features of towns) are attributed to rural residential areas.
Netherlands		n/a
Norway		No official definition, thus no official threshold.

Rural Development Statistics Questionnaire
Question 4 (concluded)

Romania		No threshold as rural is defined by law without taking the demographic size or population density into account
Russian Federation		n/a
Slovakia		100 inhabitants per square kilometre; rural settlement is a municipality with less than 5000 permanent residents.
Sweden		All settlements with less than 1000 inhabitants are rural.
Switzerland		Agglomerations of 20,000 or more inhabitants and isolated towns of 10,000 or more are considered urban. To delimit agglomerations, the number of jobs (at least 2,000) and the commuting pattern (of the economically active population 85 per cent or more work in the agglomeration). Commuting pattern, population growth rates, built-up area, population/job density and employment in the primary sector are used to decide if municipalities are part of an agglomeration or not.
Turkey		Less than 2,000 inhabitants.
United Kingdom		n/a
	England	All areas outside settlements with a population of 10,000 or more.
	Scotland	All areas outside settlements with a population of 10,000 or more.
	Wales	All areas are rural except those of a small list of communities in towns and cities that were deemed to be entirely non-rural; 150 people per square kilometre
	Northern Ireland	n/a
United States	Census Bureau Definition	The Census Bureau classifies as "urban" all territory, population, and housing units located within an urbanized area (UA) or an urban cluster (UC). It delineates UA and UC boundaries to encompass densely settled territory, which consists of core census block groups or blocks that have a population density of at least 1,000 people per square mile and surrounding census blocks that have an overall density of at least 500 people per square mile.
	ERS Metro and non-metro classification	Non-metropolitan areas that contain (1) core counties with one or more central city of at least 50,000 residents or with a Census Bureau - defined urbanized area (and a total metro area population of 100,000 or more), and (2) fringe counties that are economically tied to the core counties. Non-metropolitan counties are outside the boundaries of metro areas and have no cities with as many as 50,000 residents.
	Official Federal definition	Rural areas comprise places (incorporated or unincorporated) with fewer than 2,500 residents and open territory.

Rural Development Statistics Questionnaire
Question 5

What is the smallest territorial unit/area on which the definition of rural is based i.e. postcode areas, community districts, communities, districts or regions?	
Australia	Census Collection District i.e. census enumeration area.
Bulgaria	Municipality i.e. well-defined system settlements/villages around a municipality centre (municipalities consist of between 1 and 134 villages).
Canada	Census sub-division (CSD); Census consolidated sub-division (CCS); Census division (CD)
Czech Republic	Municipality
Denmark	Address
Estonia	Municipalities but the Territory of Estonian Administrative Division Act divides rural municipalities further into settlements.
Finland	Municipalities (NUTS 5)
France	Municipality (NUTS 5)
Germany	Kreis (NUTS 3)
Hungary	Settlement (NUTS 4)
Ireland	District Electoral Division (DED)
Italy	n/a
Kazakhstan	A village with at least 50 people of which at least half is engaged in agriculture production
Kyrgyzstan	Village
Latvia	Parishes and rural areas
Lithuania	Post code areas
Netherlands	n/a
Norway	No official definition of rural, however, density and centrality variable is mostly applied at municipality level.
Romania	Village/municipality
Russian Federation	Farm, village, selo (rural town)
Slovakia	Municipality
Sweden	Geographical coordinates/address
Switzerland	Community (municipality)
Turkey	Village.
United Kingdom	Land parcel/address; Ward; in future: Census Output Area (COA); Unit postcode; county
England	Land parcel/address; Ward; in future: Census Output Area (COA)
Scotland	Unit postcode
Wales	County (NUTS 3)
Northern Ireland	n/a
United States	Census block (Census Bureau definition); County (ERS definition)

Rural Development Statistics Questionnaire
Question 6

What is the percentage of the population that are classified to live in rural areas?	
Australia	12.84 per cent
Bulgaria	41.9 per cent (11.2 per cent in less developed rural areas)
Canada	22 to 38 per cent depending on the definition used
Czech Republic	26.5 per cent
Denmark	14.7 per cent
Estonia	32.6 per cent
Finland	43 per cent (27 per cent excluding urban adjacent rural areas)
France	24 per cent
Germany	13.03 per cent
Hungary	Narrow definition: 47.35 per cent; broader definition: predominantly rural 31.3 per cent and significantly rural 43.2 per cent
Ireland	n/a
Italy	n/a
Kyrgyzstan	65 per cent
Latvia	47.5 per cent
Lithuania	33.1 per cent
Netherlands	n/a
Norway	22.3 per cent (population not living in urban settlements)
Romania	45.4 per cent
Russian Federation	27 per cent
Slovakia	29.9 per cent (OECD definition at NUTS 4 48 per cent in predominantly rural areas)
Sweden	35 to 40 per cent
Switzerland	32 per cent
Turkey	35.1 per cent
United Kingdom	n/a
England	20 per cent (settlement based definition); 28 per cent (ward based definition)
Scotland	30.9 per cent [1)]
Wales	32 per cent
Northern Ireland	n/a
United States	21 per cent (Census Bureau definition); 20 per cent (ERS definition)

1) http://www.gro-scotland.gov.uk/grosweb/grosweb.nsf/pages/scosett#res

Rural Development Statistics Questionnaire
Question 7

What is the percentage of the total land area that is classified as rural?	
Australia	99.74 per cent
Bulgaria	83.7 per cent
Canada	99.8 per cent 'rural' and 95 per cent 'predominantly rural' (OECD definition)
Czech Republic	73.7 per cent
Denmark	n/a
Estonia	98.4 per cent
Finland	95 per cent (83 per cent if urban adjacent rural areas)
France	82 per cent
Germany	30.35 per cent
Hungary	Narrow definition: 88.3 per cent; broader definition: predominantly rural 58.3 per cent and significantly rural 37.7 per cent
Ireland	n/a
Italy	n/a
Kyrgyzstan	28.8 (53.9) per cent of the land is agricultural land and land of rural settlements (about 90 per cent of the territory lays higher than 1,500m above sea level).
Latvia	98.2 per cent
Lithuania	97 per cent
Netherlands	n/a
Norway	99.3 per cent (land outside urban settlements)
Romania	89 per cent
Russian Federation	n/a
Slovakia	76.7 per cent (OECD definition 59.5 per cent in predominantly rural areas)
Sweden	more than 95 per cent
Switzerland	77 per cent (approximately)
Turkey	n/a
United Kingdom	n/a
England	93 per cent (settlement based definition); 87 per cent (ward based definition)
Scotland	n/a
Wales	82 per cent
Northern Ireland	n/a
United States	97 per cent (Census Bureau definition); 80.8 per cent (ERS definition)

Rural Development Statistics Questionnaire
Question 8

Is there a set of core indicators used to monitor rural development policy?	
Australia	Not at present but work is underway. The Australian Government is investigating the feasibility of a whole-of-government framework to attempt to measure rural/regional policy and outcomes and indicators will be developed in support of this.
Bulgaria	There is a core set of indicators to monitor the implementation of the Special Accession Programme for Agriculture and Rural Development (SAPARD).
Canada	No official core set of indicators. An integrated Canadian national rural database is currently considered as a developmental component of the National Framework of Rural Policies (NFRP). Sets of indicators for monitoring rural communities usually start with the major variables for demography, labour force, income and health status but each list differs.
Czech Republic	There is no specific set of indicators used only for rural areas. There are several key indicators surveyed jointly in both, rural and urban areas, but they are not strictly divided according to rural or urban area.
Denmark	n/a
Estonia	The most comprehensive system for monitoring and evaluating has been developed for the Special Accession Programme for Agriculture and Rural Development (SAPARD). The indicators used for monitoring the programme are agreed with the Monitoring Committee of the SAPARD that regularly reviews the programme progress on the basis of these indicators.
Finland	Yes, there are the indicators of the Finnish Rural Indicators project. See annex A.
France	Legislation is in preparation and should come into force end of 2003. Indicators should then be set up to monitor this policy.
Germany	Indicators to monitor the EU rural development plan agreed between EU and Member States.
Hungary	Set of indicators is being developed in relation with the National Development Plan, Agricultural and Rural Development Operational Programme and the National Rural Development Plan.
Ireland	Under development. [1)]
Italy	n/a

Rural Development Statistics Questionnaire
Question 8 (concluded)

Kazakhstan	The development is monitored by the Agency for Statistics through individual farm accounting on the approved form and the collection of statistical data twice a year from each farm record. It questions members of farms about all social issues and gathers information on current plantings, farms' own property (cattle, poultry and buildings) and sampling data on crop and livestock output. Information for State-owned agricultural enterprises is compiled on the basis of State statistical reporting.
Kyrgyzstan	No but there are a few indicators used for monitoring rural development these include poverty and extreme poverty levels, poverty gap and severity, gini coefficient, children school enrolment, adult literacy level, life expectancy, unemployment level, access to drinking water, access to medical service, average per capita calorie intake.
Latvia	The Ministry of Agriculture uses a set of indicators for drawing up the Rural Development Plan.
Lithuania	No.
Netherlands	n/a
Norway	No.
Romania	There is a set of core indicators used in monitoring rural areas (see 'Carta Verde of rural development in Romania' by the Romanian Ministry of Agriculture and Food and the European Commission).
Russian Federation	The following indicators can be used for monitoring rural development policy: income levels, employment/unemployment, prices of goods and services, the level of development of social, market and utilities infrastructure.
Slovakia	Not yet. There are plans to use data from the Ministry of Agriculture, from the payment agency and from beneficiaries to monitor rural development policy.
Sweden	No.
Switzerland	No, not yet.
Turkey	In the Household Labour Force Survey settlements with 20,000 or less are defined as rural. Numbers of persons employed in rural areas by sex, age, educational status etc are gathered regularly.
United Kingdom	No.
England	No.
Scotland	n/a
Wales	Yes. The main sections are demographics, economy, agriculture, education, health, personal social services, local government finance, housing, transport, law and order, environment, tourism, deprivation, etc.
Northern Ireland	n/a
United States	No.

1) See paper submitted for the Food and Agriculture Meeting held in Geneva 2-4th July 2003.

Rural Development Statistics Questionnaire
Question 9

Can rural development statistics be found on the Internet and if so where?	
Australia	Some small area statistics on www.abs.gov.au (themes then regional statistics). There is concern however that rural/regional statistics are not visible enough on the ABS website and the home page is currently being redeveloped to include a regional portal.
Bulgaria	Not yet but database is under construction. Some information can be found on the website of the Ministry of Agriculture www.mzgar.government.bg
Canada	No systematic collection on a given site but three (partial) views are available at: a) the Canadian Rural Partnership www.rural.gc.ca b) The Rural & Small Town Canada Analysis Bulletins at www.statcan.ca/english/freepub/21-006-XIE/free.htm c) community profiles of census data at www12.statcan.ca/english/profil01/PlaceSearchForm1.cfm
Czech Republic	No.
Denmark	Population data etc can be found at www.statistikbanken.dk
Estonia	Rural development statistics/regional statistics are available on the homepage of the Statistical Office at www.stat.ee at local government unit, county and NUTS 3 level.
Finland	No.
France	Statistics on rural and urban zones can be found at www.insee.fr under 'territoire'.
Germany	Information on the publication 'Aktuelle Daten zur Entwicklung der Städte, Kreise und Gemeinden' (up-to-date information on the development of towns, districts and municipalities) at www.bbr.bund.de. Information on regional data at www.destatis.de/themen/d/thm_regional.htm
Hungary	No data available on the website of the Hungarian Central Statistical Office. Some selected data are available at the Internet site of the Ministry of Agriculture and Rural Development in the supplement of Hungary's SAPARD Plan at www.fvm.hu/english/annex2.pdf
Ireland	n/a
Italy	n/a
Kazakhstan	www.stat.kz
Kyrgyzstan	www.stat.kg
Latvia	Yes, the Agricultural Census 2001 and Population Census 2000 data base are available at http://www.csb.lv/

Rural Development Statistics Questionnaire
Question 9 (concluded)

Lithuania	www.std.lt/: General statistics - agricultural statistics by county (NUTS 3); Population and social statistics - average annual number of rural population, main indicators of employed population and earnings by economic activity; Agriculture - main indicators of agricultural activity; Environment - water consumption according to needs.
Netherlands	n/a
Norway	No rural statistics as such but regional statistics can be found at http://www.ssb.no/english/subjects/00/00/02
Romania	No.
Russian Federation	Yes: Ministry of agriculture www.aris.ru/DBASE/;Goskomstat Russia www.gks.ru; Agro-industrial complex Market www.apkmarket.ru
Slovakia	No.
Sweden	No.
Switzerland	Scattered information can be found under www.bfs.admin.ch
Turkey	The press releases and the results of the Household Labour Force Survey are available on the website of the State Insitute of Statistics www.die.gov.tr
United Kingdom	Defra Internet site under construction at www.defra.gov.uk/esg/work_htm/publications/cs/ruralinfo_web/default.asp. Small area statistics at www.neighbourhood.statistics.gov.uk
England	see United Kingdom
Scotland	n/a
Wales	Yes, in the report 'Statistical Focus on Rural Wales' (http://www.wales.gov.uk/keypubstatisticsforwales/content/publication/compendia/2001/sb49-2001/sb49-2001.htm), in the Rural Development Plan and in the statistics by Local Authority area on the Local Government Data Unit website http://www.lgdu-wales.gov.uk/
Northern Ireland	n/a
United States	Data related to rural development can be found at a) U.S. Census Bureau at www.census.gov b) Bureau of Labor Statistics at www.bls.gov c) Bureau of Economic Analysis www.bea.gov d) Economic Research Service www.ers.usda.gov e) National Agricultural Statistics Service www.nass.usda.gov

Rural Development Statistics Questionnaire
Question 10

What is the smallest area for which statistics are available and what is the average size of this area (e.g. average population size, average area, range of population sizes or range of area)?	
Australia	Census Collection District (CD) i.e. census enumeration area (average size in rural areas 100 dwellings, in urban areas 220 dwellings, area ranges from under 1,000 square metres to 230,000 square metres)
Bulgaria	Municipality (well defined system of settlements/villages around a municipality centre which may be a bigger village or a small town; between 1 and 134 villages).
Canada	Census subdivision (CSD) which are generally incorporated towns and incorporated municipalities. There are 5,600 CSDs with a population range from 0 to 2.38 million (average about 5,360).
Czech Republic	Municipalities.
Denmark	Addresses.
Estonia	Local Government Unit (average population 5494 with Tallinn, 3903 without Tallinn, range 56 to 396879; average area 176 square kilometres, range 1.8 to 582 square kilometre).
Finland	Sub-regional units (NUTS 4).
France	Municipalities.
Germany	Municipalities (average population about 5,900).
Hungary	Settlements (municipality?) (average population about 3230).
Ireland	District Electoral Division (DED) (average population 1096)
Italy	n/a
Kazakhstan	Private and state-owned farms
Kyrgyzstan	Districts, villages; for agricultural statistics usually the county within a district (between 4,000 and 20,000 inhabitants)
Latvia	Parishes (NUTS 5)
Lithuania	Rural settlement (village) (average size 53 inhabitants, range from 1 to 4700); Rural municipality (average size 24.4 thousand inhabitants, range 6.6 to 83.6 thousand inhabitants; average land area 135.3 thousand hectares, range 43.6 to 220.9 thousand hectares)
Netherlands	District (average population about 1500, range 0 to 30,000; average area 3 square kilometre, range from under 1 to 130 square kilometres); for statistics for funding purposes: statistics based on terriorial unit of 500m square
Norway	Basic (statistical) units (subdivision of municipalities, there are about 14,000 basic statistical units in Norway; they are a flexible basis for the work with and presentation of regional statistics)
Romania	Villages (average population about 800)
Russian Federation	n/a
Slovakia	Municipality (average population 1844, range 10 to 117227)
Sweden	Individuals/households.
Switzerland	Hectare or commune - depending on the statistics.
Turkey	Village (average population about 640)
United Kingdom England Scotland Wales Northern Ireland	Census Output Areas (average population about 250) Electoral districts; Small Agricultural Area for agricultural statistics (about 1000 farms)
United States	Census Blocks (there are 7,017,427 census blocks)

Rural Development Statistics Questionnaire
Question 11

What statistics are available for this smallest area?	
Australia	Every five years, full range of variables from the Census of Population and Housing (demographics, employment, income, characteristics of dwellings). In non-census years data are only available for larger spatial units. Very few economic variables are available for small areas but agricultural commodity data are available for Statistical Local Areas every five years and for Statistical Divisions in other years.
Bulgaria	Data for age structure, inhabitants, area, population density, employment/unemployment levels, education level etc.
Canada	All Census of Population variables, however, data for census subdivisions with fewer than 200 inhabitants are typically suppressed for questions in the long questionnaire which contains the major variables on educational attainment, labour force participation, income etc.
Czech Republic	Only a limited number of indicators such as population, land area, social and cultural variables, health service and trade possibilities and for some environmental matters such as water supply network, public sewage system, waste collection.
Denmark	n/a
Estonia	The Estonian Rural Development Database contains official statistics on population, stock of urban streets and local roads at the local government unit level. It also contains non-official data on entrepreneurs, local budget revenue and expenditure, income tax, state budgetary relief fund, appropriations for investment, local government debt, dwelling completions, non-residential building completions, subsistence allowances, registered unemployed and the number and areas of fires. Non-official data on the number of schools and students, local land stock, main indicators on libraries and distance of local government unit from the capital and the county centre will be added soon.
Finland	The indicators of the Finnish Rural Indicators project which relate to population and migration, structure and function of the economy, living conditions and welfare, sustainable development.
France	Population census data, agricultural census data, municipality inventory, business survey results, services and facilities available to inhabitants of the municipalities, movements of inhabitants in municipalities lacking facilities.
Germany	Various statistics are available for municipalities, others for Kreise (districts) details can be found at www.brandenburg.de/statreg/regio-stat-katalog_2003.pdf
Hungary	There are about 400 variables collected annually for each settlement.
Ireland	Population statistics, agricultural statistics.
Italy	n/a
Kazakhstan	Individual farm records.
Kyrgyzstan	Statistics on agriculture, wages, population number, selected variables of transport statistics, finances are produced at the level of rural councils. The population census data are available by each town, urban-type settlement and village.

Rural Development Statistics Questionnaire
Question 11 (concluded)

Latvia	Some agricultural, population and social statistics.
Lithuania	Rural settlements - number of population; Rural municipality - majority of agricultural, demographic and social statistics; Total municipality - majority of agricultural, demographic, social, industry, transport and service statistics.
Netherlands	Population data (number, gender, age class, population density, household composition, immigrants (first and second generation) from non-western countries); address density; residences (number and average value for tax); income (average per head, average per person receiving income, persons with high income (percentage), persons with low income (percentage), persons aged 15 to 64 with social security as main source of income (percentage); land area and total area (including water); land use (e.g. urban and rural area, traffic, built-up, semi-built-up recreational, agricultural, forest, nature).
Norway	Mainly population statistics. Furthermore, coordinates or basic statistical unit code identify most enterprises in the Business Register and almost all agricultural holdings are identified by coordinates.
Romania	Various statistics which can be found in the settlement/locality file.
Russian Federation	n/a
Slovakia	Statistics on a limited number of indicators are available (population, land acreage, social and cultural facilities, health service and trade possibilities etc) and for some environmental matters (water supply network, public sewage system, water waste treatment, waste collection, expenditures on environmental protection).
Sweden	Examples: number of inhabitants, number of households, migration, age distribution, educational level, unemployment, disposable income.
Switzerland	For the hectare Swiss land use statistics; for the commune/municipality the population, agricultural and enterprise statistics as well as the Swiss land use statistics.
Turkey	Social, demographic and economic characteristics of population are available for villages from the 2000 Population Census. Information about age and sex structure, literacy, fertility, labour force, occupation, economic activity and employment status is also available.
United Kingdom	Census data, some survey data will be made available at this level.
England	
Scotland	
Wales	Data for Electoral Districts are only available for data collected in the 2001 Population census. Most socio-economic indicators are only reliable at the Local Authority Level.
Northern Ireland	
United States	Basic population and housing data. More information available at census tract level.

Rural Development Statistics Questionnaire
Question 12

Are statistics on urban settlements/urban land use available?	
Australia	Yes, the full range of Census of Population and Housing variables is available for urban settlements.
Bulgaria	Yes, on urban municipalities.
Canada	Yes, data are available for urban settlements, but urban land use data is only available from specialised surveys on a case by case basis.
Czech Republic	Statistics on urban settlement and land use are available (in the statistical office and the cadastral office)
Denmark	Yes.
Estonia	Yes, on urban municipalities.
Finland	One of the area types is rural areas.
France	Yes, at the level of municipalities to follow the development of the different zones which are recalculated after every population census. At a more aggregated level through the LUCAS surveys.
Germany	Yes, updated every four years.
Hungary	Yes.
Ireland	n/a
Kazakhstan	A sample survey is held for urban settlements once a year.
Kyrgyzstan	Yes.
Latvia	Yes.
Lithuania	Yes, demographic statistics and urban land use statistics.
Netherlands	Yes, land use statistics are produced every 3 or 4 years. Delineating urban settlements on the basis of urban land use statistics is a research project for the next months. In principle, coding addresses to urban settlements is possible and is also subject to research.
Norway	Yes.
Romania	Yes.
Russian Federation	n/a
Slovakia	Yes, statistics on urban settlement and urban land use are available in the cadastral office/land registry and in the statistical office.
Sweden	n/a
Switzerland	Yes.
Turkey	No. However, a project is under way on Land Use by Using CORINE methodology. The aim of the project is to classify 44 classes of land use as applied in the CORINE project. At the end of this project some information on urban settlements will be available.
United Kingdom	Yes.
England	Yes.
Scotland	n/a
Wales	Yes.
Northern Ireland	n/a
United States	Yes, some data are available.

Rural Development Statistics Questionnaire
Question 13

Which organization(s) is/are responsible for rural development policy?	
Australia	At federal level mainly the Ministry of Agriculture, Fisheries and Forestry, Australia (AFFA - responsible for agricultural policy which impacts significantly on rural areas) and the Department for Transport and Regional Services (responsible for regional development in general and this includes rural areas). Economic development in rural/regional Australia is devolved to State/Territory Governments.
Bulgaria	Ministry of Agriculture and Forestry (MAF)
Canada	The federal Rural Secretariat had the task of co-ordinating the federal approach to rural development because all government departments have policies and programs directed to rural citizens. Similarly, each provincial government has a lead agency with a mandate to co-ordinate the approach of provincial government ministries to rural development. Finally, there are regional and rural development groups within most provinces.
Czech Republic	Ministry for regional development and regional authorities.
Denmark	Ministry for the Interior and Health
Estonia	Ministry of Agriculture
Finland	Ministry of Agriculture and Forestry; Rural Policy Committee
France	Ministry of Agriculture, Food, Fisheries and Rural Affairs
Germany	The 16 federal Länder governments have the main responsibility for rural development policy. Within the Länder governments, it is the Ministries with responsibility for agriculture, regional policies, environment, protection of nature and transport that influence rural development most directly.
Hungary	Ministry of Agriculture and Rural Development.
Ireland	Department of Community, Rural and Gaeltacht Affairs.
Italy	The 20 Italian Regions
Kazakhstan	Ministry of Agriculture.
Kyrgyzstan	At present, on the instructions of the President of the Kyrgyz Republic and in pursuance of the goals of the Comprehensive Development Framework the Kyrgyz Republic has started to prepare a set of documents aimed at comprehensive rural development. Almost all ministries and agencies are preparing relevant documents in their respective fields.
Latvia	Ministry of Agriculture

Rural Development Statistics Questionnaire
Question 13 (concluded)

Lithuania	Ministry of Agriculture is responsible for rural development policy; Ministry of Social Affairs and Labour is responsible for social aspects including rural areas; Ministry of Internal Affairs is responsible for coordinating National Regional Policy.
Netherlands	Ministry of Agriculture, Nature and Food Quality; Ministry of Housing and Spatial Planning and the Environment; Ministry of Economic Affairs, Social Affairs and Employment; Regional Governments/Provinces (at NUTS 2 level).
Norway	Ministry of Local Government and Regional Development (main responsibility and co-ordination); Ministry of Agriculture; Ministry of Fisheries; Ministry of Transport and Communication; Ministry of Trade and Industry.
Romania	Ministry of Agriculture, Food and Forestry and Ministry of Public Finance; Inter-ministry Committee for Agriculture and Rural Development.
Russian Federation	Republics, territories and regions and coordinated by the Government and the Ministry of Agriculture.
Slovakia	Ministry of Agriculture
Sweden	Ministry of Industry, Employment and Communication.
Switzerland	Federal Office for Spatial Development (ARE)
Turkey	State Planning Organization (SPO) is responsible for project planning; Ministry of Agriculture and Rural Affairs is responsible for monitoring rural projects.
United Kingdom	Department for Environment, Food and Rural Affairs and devolved Departments.
England	Department for Environment, Food and Rural Affairs
Scotland	Scottish Executive Environment and Rural Affairs Department
Wales	Welsh Assembly Government Agriculture and Rural Affairs Department
Northern Ireland	Department for Agriculture and Rural Development Northern Ireland
United States	The Rural Development (RD) Mission Area of the U.S. Department of Agriculture (USDA) operates as the main rural development programs in the United States. However, other Federal development programs critical to rural development are operated by other Federal and State agencies. USDA-RD is responsible for co-ordinating the rural aspects of these programs, to the extent this is possible. USDA also participates in and supports the National Rural Development Partnership, which includes representatives of Federal, State, and non-governmental organizations with an interest in rural development.

Rural Development Statistics Questionnaire
Question 14

What are the aims/objectives of rural development policies?	
Australia	To improve the economic performance of rural and regional areas so that the potential for them to contribute to the wealth and competitiveness of Australia as a nation is maximised.
Bulgaria	See annex C.
Canada	Generally to improve the well-being of rural communities.
Czech Republic	Rural development means creating of administrative and economic conditions to support the rural area residents in their harmonised development of healthy environment, in their care about natural and cultural worth of rural landscape and in the development of environment-friendly systems of farming.
Denmark	n/a
Estonia	The main objective of the pre-accession programme for agricultural and rural development (SAPARD) is to contribute to the implementation of aquis communautaire concerning the common agricultural policy and related policies and to solve priority and problems for the sustainable adaptation of the agricultural sector and rural areas in Estonia.
Finland	The Rural Policy Committee has been structured around five permanent priorities: (1) reform of the economic activities in rural areas (2) development of know-how and human resources (3) strengthening the existing service network (4) development of the quality of the residential environment and community structure in rural areas (5) sustainable utilisation of natural resources
France	n/a
Germany	The directive Nr 1257/1999 put the main focus on the promotion of the multifunctionality of agriculture. However, increasing emphasis was also given to non-agricultural activities, aspects of sustainability and the employment.
Hungary	(1) More competitive economy (2) Better utilisation of human resources (3) Better quality environment, more balanced regional development.
Ireland	Improving the physical, economic and social conditions of people living in the open countryside, in coastal areas, towns and villages and in smaller urban centres outside of the five major urban areas.
Italy	Enhance the competitiveness and viability of rural areas (the objectives stated in the regulations of the second pillar of the Common Agricultural Policy)
Kyrgyzstan	Development of small towns and remote districts.

Rural Development Statistics Questionnaire
Question 14 (continued)

Latvia	(1) Promotion of dynamic development of rural economy, thus ensuring the increase in the level of welfare of the rural population (2) Maintenance of the population living in rural areas and ensuring the availability of various social infrastructure services in rural territory equivalent to the level available in towns (3) Ensuring the sustainable and efficient utilisation of rural resources by maintaining and preserving a tended and biologically diverse rural environment and landscape for future generations.
Lithuania	According to the Law on Regional development of the Republic of Lithuania (adopted in 2000) the main aims are to reduce the social and economic inequality between the regions and within the regions and to stimulate the equal and stable development of all regions. The Law on Agriculture and Rural Development of the Republic of Lithuania (2002) gives legal basis for the main principles of agricultural and rural development. It seeks to create a cooperative and competitive agricultural sector oriented towards the market; to increase agricultural income and to improve the quality of life of rural people as well as to meet their indivudual, social, economic and cultural needs; to ensure that high quality and safe agricultural and food products reach the market; to expand exports of agricultural and food products; to gurantee as high as possible self-sufficiency of agricultural and food products; to develop a sustainable food industry in which integrated agriculture has a main share; to save the environment by using agri-environmental methods and to induce sustainable use of renewable resources.
Netherlands	Objective for rural development of the Ministry of Agriculture, Nature and Food Quality: The creation of a living and sustainable countryside, allowing space for the various functions of living, work and recreation; to enhance liveability while preserving the existing qualities of the countryside. This is realised through the four policy fields of agriculture, nature, recreation and landscape.
Norway	To maintain the central features of the population settlement pattern and to have equal living conditions throughout the country.
Romania	The strategic objective proposed by the PNADR (Plan National of agriculture and rural development?) are the following: the sustainable development of agri-food competitive sector by modernisation and improvement of processing and marketing of agricultural and fish products; increasing of the living standard in rural areas by the improvement and development of social infrastructure and by defining and establishing good agricultural practice as a need for a sustainable agriculture and rural development; the development of rural economy by establishing and modernising buildings for private agricultural and forest exploitations, the development and diversification of economic activities, in order to maintain and/or create alternative/additional incomes and new employment; the development of human resources by improving professional training of agricultural producers and forest owners and by building institutional capacity consolidation.

Rural Development Statistics Questionnaire
Question 14 (concluded)

Russian Federation	The social components of reforms in agriculture is one of the most important objectives of rural development policy.
Slovakia	The improvement of the quality of life of the rural population, provision of sufficient number of jobs and adequate income. To preserve environment and sustainable development for rural areas.
Sweden	Good living conditions and development opportunities for rural areas and rural populations.
Switzerland	The Confederation's policy in respect of spatial and transport planning, sustainable development and the alpine conservation convention has been prepared and implemented by the Federal Office for Spatial Planning since 1 June 2000. The remit of the Federal Office includes the following: (1) Strategies for spatial and transport planning and for sustainable development (2) Principles for spatial planning, general and leisure traffic, sustainable development and the alpine conservation (3) Liaison between federal authorities on projects affecting land use and transport (4) Collaboration with the cantons in all official tasks (5) Assisting with coordination to solve problems connected with agglomeration policy and equalisation measures in rural areas (6) Information (7) Monitoring spatial planning from a legal viewpoint.
Turkey	The aims of rural development are to support and encourage rural activities to increase income of the rural population by diversification and intensification of agricultural activities; to encourage agro-industry and finally to increase capacity building in those areas.
United Kingdom	
England	The target is to reduce the gap in productivity between the least well performing quartile of rural areas and the English median by 2006, and improve the accessibility of services for rural people. The evidence for poor economic and social conditions in some rural areas is both compelling and measurable. Our target is to lay solid foundations to achieve sustainable and long term regeneration in these areas.
Scotland	n/a
Wales	(1) To create a stronger agriculture and forestry sector (2) To improve the economic competitiveness of rural communities and areas (3) To maintain and protect the environment and rural heritage
Northern Ireland	n/a
United States	Rural development policies have a variety of objectives. The general aim is to improve quality of life in rural areas. More specifically, USDA's RD programs cover infrastructure, business, and housing assistance, plus several comprehensive assistance programs, including the rural empowerment zone program.

Rural Development Statistics Questionnaire
Question 15

What are the main themes of rural development?	
Australia	Two over-arching themes are evident in Australian regional/rural policy: (1) place-based issues of economic growth and development and ultimate competitiveness, and the concomitant natural resource management and environmental impact issues (sustainable development) (2) socially focussed issues - the quality of life and well being of people who reside in rural/regional/remote Australia
Bulgaria	See annex C.
Canada	Creating a favourable environment for rural development by improving infrastructure; supporting the renewal of communities through innovation; support building community capacity potential.
Czech Republic	Development of agricultural activities and processing of the production; reestablishment of handicrafts, trade and business activities and services and tourism; support and development of employment opportunities; improvement of the municipality facilities for residents (schools, health services, etc.); maintenance of the public open space (including care of lawns and water areas)
Denmark	Economic activities and environmental aspects.
Estonia	Promotion of rural entrepreneurship; living conditions in rural areas; infrastructure and land improvements; private forestry and cooperative activities; research, training and advisory system.
Finland	According to the Rural Policy Committee outlines for rural policy are: there is a wide range of economic activities in the rural areas; the possibility to use modern information technology should be made available to everybody, the development of the environment for innovation in rural areas is one of the cornerstones in rural policy, multifunctional agriculture and pluriactive farms are special characteristics of the Finnish rural areas; the connection between culture and development is understood and recognised in all rural development work; curbing and reducing the differentiation of municipalities; in order to for the rural policy to succeed in securing the viability of the rural areas, watertight development systems are needed not only in the municipalities but also at the level of villages and sub-regional units; new means to advance the justice to the citizens and equality between the regions should be found for regional development; the urban, interaction and rural policies constitute an extensive and functioning whole for the regional development that is the best suited for the Finnish conditions
France	n/a
Germany	Improvement of the competitiveness of the agricultural sector; rural development; environment and compensatory measures
Hungary	Modernisation of agricultural production; improving human conditions of production; modernisation of food processing; improving the economic potential of rural areas; increasing employment; making rural areas more attractive; maintenance of agricultural land use in areas with unfavourable conditions and under environment protection restrictions; environment-friendly agricultural production, landscape protection and agricultural environment protection; maintaining the economic, ecological and social role of forests.
Ireland	Vibrant sustainable communities; sufficient income and employment opportunities; adequate access to education, training and social and other services and infrastructure; effective participation in structures and decision-making processes in an inclusive society; a situation where cultural identity including language, traditions and a sense of community are valued and retained; sustainable development and respect for the environment.

Rural Development Statistics Questionnaire
Question 15 (continued)

Italy	Investment in competitiveness, rural viability, quality of life and sustainable agriculture, animal welfare, food quality.
Kyrgyzstan	(1) Development of effective local governments (2) Social development of local communities (3) Development of rural social and engineering infrastructure (4) Provision of sustainable growth in rural areas
Latvia	see annex B
Lithuania	Investment in primary agricultural activity: reconstruction and equipment of farm buildings, pruchase of agricultural machinery, creation of specialized farming; investment in agricultural and fish products processing and development of marketing; development and diversification of farm activities: stimulation of small businesses, processing of agricultural product produced on farm, rural tourism, non-traditional economic activities in rural areas; diversification of farm activities including processing; development of rural infrastructure for general use; development of forestry, of forestry infrastructure, afforestation of non-agricultural land; stimulation of ecological farming; professional agricultural training; support for preservation and breeding of rare fish, for breeding and seed farming, for purchase of seeds and pedigree material; support for establishment of young farmers; registration and identification of farm animals; creation and introduction of agricultural information system, development and consultation services; development of food quality control, veterinary and plant protection control including border control; direct payments for declared crop area of cereal, flax, rape, rich in starch potatoes and other agricultural crops, in animal production direct payments for suckling cows, ewes and animals to be slaughtered and to dairy farms; compensatory payments for farming in areas not favourable to farming.
Norway	Development in population, economic development in general, business investments, establishment of new enterprises, empployment/unemployment, service provisions, infrastructure.
Netherlands	Our most important policy tasks regarding the physical quality of the rural area are: putting the water system in order; realising the National Ecological Network; making agriculture more sustainable and more in tune with the wishes of society; preserving and developing a valuable living environment; specific tasks regarding specific landscapes (sandy areas, grasslands in the peatlands area and the riverlands).
Romania	The measures proposed by the SAPARD Regulations is as follows: processing and marketing of agricultural and fisheries products; improving the structures for quality veterinary and plant health controls, foodstuffs and consumer protection; development and improvement of rural infrastructure; management of water resources for agriculture; investment in agricultural holdings; setting up producer groups; agri-environmental measures; development and diversification of economic activities, multiple activities, alternative income; forestry; improving the vocational training; technical assistance.
Russian Federation	The main directions of rural development are defined in the Federal programme 'Social development in rural areas until 2010'.

Rural Development Statistics Questionnaire
Question 15 (concluded)

Slovakia	SAPARD: Priority 1 Improvement of the agricultural production sector including food industry (measures: Investment in agricultural enterprises, improvement of processing and marketing of agricultural and fish products, setting up of producer groups) Priority 2 Sustainable rural development (measures: diversification activities in rural areas, forestry, agricultural production methods designed to protect the environment and maintain the countryside, land consolidation) Priority 3 Development of human activities (measures: development of human resources, technical assistance)
Switzerland	Decentralised settlement and conservation of the cultural heritage of the landscape; assisting with coordination to solve problems connected with agglomeration policy and equalisation of measures in rural areas.
Sweden	n/a
Turkey	Employment, rural infrastructure, human resources, settlement patterns, organisational arrangements, sustainability of rural development.
United Kingdom	n/a
England	The white paper focuses on: investing in quality services (schools, education and child care places, health care, internet access); improvements in service delivery (extended service provision by post offices, cash machines, support schemes for village shops, pubs and garages, etc.); affordable homes; better transport; rejuvenating market towns and creating a thriving modern economy; new future for traditional industries (i.e. agriculture); ensuring that everyone can enjoy the countryside (tourism); protecting what makes the countryside special (environment)
Scotland	n/a
Wales	(1) Income and employment of people found on farms (2) The environmental aspects of land use. The most significant strands of the Rural Development Plan for Wales are (1) support for farmers in disadvantaged areas (2) agri-environmental payments. Less important strands are the investment on farms for improving the holding and on-farm diversification, improving processing and marketing of agricultural products, forestry. Support for non-agricultural businesses and community development is not strong.
Northern Ireland	n/a
United States	Sustainable community development; 'bottom-up' policies in the sense that they support the community's own plans and goals for development, rather than a policy solution imposed by a higher level of government; Federal assistance targeted to places that need help the most; Federal assistance should 'leverage' assistance from other sources to get 'the most for the buck'

Annex A: The indicators of the Finnish Rural Indicators project.

POPULATION AND MIGRATION
Population density, inhabitants/km^2
Distribution of population by types of area, %
Increase of population
Excess of births
Internal net-migration, total
Internal net-migration by age group
Area's population as percentage of whole Mainland Finland's population
Population by sex and age group
Men's relative proportion of population aged 25-64
Demographic dependency ratio
Summer residents' relative proportion of regular population (summer residents refers to the total number of persons in the household-dwelling units of free-time residence owners)
Free-time residences per 1000 inhabitants

STRUCTURE AND FUNCTION OF THE ECONOMY
Number of labour force
Proportion of labour force in the population of working age
Economic dependency ratio
Unemployment rate, total
Change of unemployment rate
Workplaces by industry
Change of number of all workplaces
Ratio between number of jobs in an area and number of employed living in an area
Number of commuters (commuters are defined as persons who cross the municipal border to get from their place of residence to their place of work)
Percentage of commuters to employed living in an area
Net-commuting
Net income flow of commuting
Value added, whole country = 100
Value added per capita, whole country = 100
Number of establishments of enterprises by size category of personnel
Number of establishments of enterprises per 1000 inhabitants
Number of establishments of enterprises by industry
Number of enterprise openings and closures by industry
Number of active farms
Average area of arable land of active farms, ha
Average income subject to state taxation of farms by source of income
Commercial roundwood removals of private forests, m^3
Local income tax rate in municipal taxation
Average total tax revenues of municipalities per inhabitant

LIVING CONDITION AND WELFARE
Average income subject to state taxation per income recipient
Persons in receipt of living allowance as percentage of population
Population aged 15 years or over by level of education

SUSTAINABLE DEVELOPMENT
Arable land under cultivation and uncultivated arable land of all farms
Organic farms as percentage of all active farms
Organically farmed area as percentage of all arable land of active farms

Annex B: Latvia - Answer to Question 15:

Main Themes

Economic activities not related with the agriculture, forestry or fishery (in line with the National Programme for the Development of Small and Medium Size Enterprises, National Employment Plan, the actions listed in the action strategy of the Ministry of Agriculture for the years 2003-2005, etc.):

- efficiently utilises all resources available in rural environment, thus contributing to the employment and welfare of the rural population;
- maintains and develops the rural environment as an attractive life, work and recreational place for everyone;
- ensures the flexibility of rural economy with respect to the changes in the foreign and domestic markets, and maintains a stable welfare standard of the rural population.

Tourism (in line with the Rural Tourism Development Programme)-

- ensures the availability of the cultural and historical heritage and landscape qualities featuring the rural environment of Latvia to everyone*;*
- ensures the good quality and environmentally adequate economic infrastructure for the needs of mobility, communications and economic activity of the population (in line with the Regional Development Law);
- improves, enhances and diversifies the professional skills of the rural population (in line with the National Employment Plan and the Strategy for Investments to Welfare Sector for the Years 2003-2007 and the Concept for Crediting of Students)

- creates and supports the groups / organisations of economic cooperation promoting and supporting the economic development of rural areas, involving socially outcast groups of population in business activity thus reducing the poverty in line with the Commercial Law of the Republic of Latvia, Cooperative Societies Law, Agricultural Law, the Strategy for Investments to Welfare Sector for the Years 2003-2007).

The measures implemented and/or planned for implementation under the objective 'Maintenance of population in rural areas and ensuring the availability of various social infrastructure services in rural territory equivalent to the level available in towns' are aimed at:

- rationalising and developing the services of social infrastructure (education and training systems, healthcare and social security systems, culture, etc.) and tending and maintaining the historical and cultural values / heritage (in line with the National Investment Programme);
- creating and supporting the local initiatives for the activation of economic and social life in the territory, encouraging the cooperation among inhabitants in the implementation of social and economic activities in the territory, and minimising the outcast of various social groups in rural villages / communities;

- establishing and supporting various social matters groups / organisations for dealing with social assistance issues and initiation of economic activities in rural territories (in line with the Strategy for Investments to Welfare Sector for the Years 2003-2007);
- improving and rationalising the operations of local administrative, regional authorities by securing the exchange of information and minimising the outcast of informative character in the periphery (in line with the Regional Development Law of the Republic of Latvia and the Administrative-Territorial Reform Law).

The attainment of the objective - *Ensuring the sustainable and efficient utilisation of rural resources by maintaining and preserving a tended and biologically diverse rural environment and landscape for future generations* – is supported by adoption of certain Regulatory enactments and strategic documents – laws of the Republic of Latvia, Cabinet Regulations, and by implementation of the National Biodiversity Programme (1999). Latvia has ratified different international conventions, and is proceeding with the harmonisation of its national legislation with the Directives of the European Union in the sphere of environment, with a view to:

- ensuring, in all kinds of economic activity, an environmentally friendly management meeting the environmental requirements to cause a minimum negative impact on the ecology of rural environment (nature, air, climate, soil, water) and maintaining a tended landscape characteristic to the countryside of Latvia;
- preserving, protecting and promoting the variety of wildlife populations, species and biotopes recognised both nationally and internationally;
- protecting and maintaining the historical, cultural and landscape (reserves, nature parks, coastline, etc.) values recognised both nationally and internationally.
- protecting, enhancing and promoting the local origin breeding animals of important breeds of agricultural animals and cultivated plants, which are recognised as endangered populations both nationally and internationally.

ANNEX C: Bulgaria

Answer to question 3: Are there any subdivisions of rural areas relating to the degree of rurality?

At present, Bulgaria doesn't have legislation to regulate assistance for agricultural producers in less favorite areas, compatible with EU analogues. Legal acts, which regulate similar matters are:

- **The Farmer Support Act (published SG 58/22. 05. 1998)**
- The Regional Development Act (SG 26/23. 03. 1999)
- The Agricultural Land Protection Act (SG 35/24. 04. 1996)

The Farmer Support Act.

The provisions of this law are closest to the provisions in Council Regulation 1257/1999 on support for rural development from the EAGGF. This law regulates the state support to farmers for the production of market oriented agricultural produce. One of the purposes of state support is the development of agricultural produce in regions with deteriorating social and economical characteristics, or in regions with unfavorable environmental conditions. These regions have been defined in the Final provisions to the law as follows:

"Regions with deteriorating social and economical characteristics" are regions threatened by depopulation or regions of low population density, with restricted employment possibilities, which accelerated rate of decline threatens the economic vitality of the specific region and its population in the long run.

"Regions of unfavourable environmental conditions" for agricultural development are regions where there are permanent natural limitations on agricultural development, due mainly to the poor soil qualities, with cultivated land situated on steep slopes, and short vegetation periods. Such limitations can be overcome at high costs leading to high agricultural production cost, which prohibits the generation of incomes by agricultural producers in such areas, comparable to the incomes of agricultural producers occupied in the same kind of agricultural activity in other regions of the country.

The indicators in the Ordinance identifying the "less developed rural areas" are similar to these, used to define "less favored areas" in Article 19 from Council Regulation 1257/1999. According to the Ordinance the "less developed rural areas" cover municipalities or groups of municipalities with predominantly rural way of life, specialized in farming and forestry, with low level of economic development, underdeveloped technical infrastructure and workforce qualification, suffering from acute social problems such as high unemployment rate, low income per capita, and rapid depopulation.

The criteria for the identification of less developed rural areas are as follows:

1. Absence of a big, very big or medium-sized city or town in the area – the biggest town in the area is with population below 30 000 people;
2. Income per capita during two of the last three years should amount to less than 30 % of country's average in the preceding year;
3. Average unemployment rate in two of the last three years should amount to over 50 % of the country's average in the respective year;
4. Population density below 75% of the country average, expressed in "persons per square km.";
5. The relative share of agricultural or forestlands should exceed by 20 % the relative country's average;
6. The relative share of employment in farming and forestry within total number of employed should amount to over 20 % of the country's average for the preceding year.

According to Ordinance № 14 (SG, № 35/2003) on defining of settlements in rural and mountainous areas, the mountainous areas are defined as follows:

"Mountainous areas are areas with altitude above 600 m., with depth of relief segmentation above 200 m. measured between the lowest and highest point on 1 sq.km., while the density of relief segmentation is above 2 sq.km., and the area slopes are above 12° steep. Mountainous are municipalities, in which more than a half of their settlements territories are mountainous territories".

With the completion of the Twinning Light Project BG/2001/IB/AG/03/TLF "Strengthening the administrative capacity of the Rural Development Directorate of MAF to implement chapter V of EC Regulation 1257/1999" under the Twinning Light Facility BG 0105.02, we have the methodology for defining of less-favored areas and areas with environmental restrictions in Bulgaria. Criteria for the definition of mountainous municipalities, which give the following indicators, have been prepared:

- Average altitude above 600 m;
- Average area slope above 10° (17,6);
- Average altitude from 500 m to 600 m, combined with an average area slope above 7 ° (12,3 %).

The criteria for the definition of other less-favored areas are as follows:

- Population density less than country's average – 71 person/sq.км;
- Employed in Agriculture more than 10 % during the last 3 years;
- Low productivity of the agricultural lands with indicators – an average category of the soil less than 6th (country's average -5,5);
- Principle of the homogenization: next municipalities with a category of the agricultural land at least 5th.

Answer to question 14: What are the aims/objectives of rural development policies?

The main objectives of the NARDP (National Agriculture and Rural Development Plan 2000-2006) as follows:

- Improvement of agricultural production efficiency and promotion of a competitive food-processing sector by better market and technological infrastructure and strategic investment policies ultimately aimed at reaching EU standards.
- Sustainable rural development consistent with the best environmental practices by introducing employment, diversification of economic activity and establishment of the necessary infrastructure. This in turn will improve the living conditions and standards of rural communities, generate fairer income and open up employment opportunities.

The main objective of the National Agriculture and Rural Development Plan (NARDP), which is under preparation, is achievement of strategic objectives of the National Development Plan of Bulgaria for the period 2007-2013, namely:

Achievement and maintenance of high economic growth through a dynamic economics of knowledge in compliance with the principles of sustainable development.

Increase of the potential of human capital and achievement of levels of employment, incomes and social integration thus ensuring high quality of life.

On the basis of the strategic guidelines of the Community regarding the policy in the field of rural areas development for the period 2007-2013 and in order to realize the main priorities of EU regarding employment, growth and stability (Lisbon, Göteborg), to guarantee that it complements the other policies of EU (cohesion, environment; especially, coordination with the Structural funds and management of the natural resources in the rural areas) and on the basis of the social-economic conditions, prevailing in the rural areas of Bulgaria, their strengths and potential, the following objectives of the National Agriculture and Rural Development Plan for the period 2007 – 2013 were defined:

1. Development of competitive agriculture, forestry and food-processing sector through support of productions adding value to the agricultural products and by transfer of innovations in small and medium enterprises, production quality improvement and development of human potential.
2. Conservation of the natural resources and protection of the environment in the rural areas through sustainable land and forestry management in compliance with the international commitments, ecological strategies and legislation environment protection.
3. Improvement of the quality of life in rural areas through of creation of employment opportunities in non-agricultural activities, development of services and building of the necessary infrastructure considering nature conservation and protection.

All of the three objectives are intended to improve the economic and social conditions in the rural areas. They complement each other and correspond to the final objective of the National Agriculture and Rural Development Plan. They are clearly directed to improve the competitiveness of the agricultural structures and market effectiveness and to increase the standard of living in the rural areas.

Answer to question 15: What are the main themes of rural development?

The main themes are:

1. Improvement of the conditions for production while taking account of animal welfare, food safety and quality in accordance to the EU requirements; fostering innovation in the processing and adding value, as well as support to organic production;
2. Environment protection and sustainable land management
3. Sustainable development of the rural areas through the creation of employment and improvement of the infrastructure;
4. Investments in human resources;
5. Investments in the local communities in the rural areas development.

CHAPTER VI

INVENTORY OF RURAL INDICATORS BY INTERNATIONAL ORGANIZATIONS

In recent years international organisations (OECD, Eurostat, FAO, World Bank, etc.) have been working in the area of rural development and its related statistics[1]. The FAO has been actively engaged with rural development statistics since at least the 1979 World Conference on Agrarian Reform and Rural Development. Ten years later, the FAO published "*Guidelines on Socio-Economic Indicators for Monitoring and Evaluating Agrarian Reform and Rural Development*" which, as the title suggests, deals with both agricultural and rural indicators (FAO, 1988). In 2008, the joint effort of the World Bank, FAO and the Global Donor Platform for Rural Development produced the Sourcebook of indicators for monitoring and evaluation: "*Tracking results in agriculture and rural development in less-than-ideal conditions*" (GDPRD *et al.*, 2008). This Sourcebook provided a set of 19 priority indicators based on the criteria of comparability, availability and relevance in order to describe different agricultural and rural development activities and programmes.

In the sections below a brief account is given of the set of indicators developed by the major international organisations. This builds on the introduction already given in Section IV.3 of Chapter IV to the themes within rural development on which these organisations have identified their need for statistics. Many of the indicators and the arguments behind them are of course much the same for all international organisations. Details of the OECD indicators are given first and these are not repeated in subsequent sections for the other organisations. This explains why the OECD section is much longer than those for the other organizations.

[1]In the OECD, rural development statistics are covered by the Territorial Indicators Group. Eurostat has set up a rural development statistics unit within the directorate that also covers agricultural, food and environmental statistics for EU Member States. Within the FAO, rural development falls mainly within the responsibility of the Sustainable Development Section.

In order not to burden the text the various list of indicators explored and/or adopted by the OECD, European Union, World Bank and FAO are shown as Focus Sections below, respectively. These include details about the definitions of the indicators.

Focus on OECD Inventory of Rural Indicators

Focus on European Union Inventory of Rural Indicators

Focus on the World Bank Inventory of Rural Indicators

Focus on the FAO Inventory of Rural Indicators

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Focus on OECD Inventory of Rural Indicators

Introduction

Since rural development is a complex, multi-dimensional concept, rural conditions and trends cannot be described by a single yardstick. To cover the various perspectives, a whole set of indicators has to be found. Furthermore, the focus of analytical and policy interest in rural affairs changes over time.

Rural to urban migration has always been a major issue but even here perspectives have changed. In some countries there is evidence of counter-urbanisation and rural revival. Analysis of the economic determinants for migration has often led to a particular interest in the structural adjustments in agriculture. Rural has often been used as a synonym for agricultural. Such a notion has lost its usefulness because agriculture has long since ceased to be the most important economic base for most rural areas in OECD Member countries. Farmers have become a minority even in rural villages and rural people are employed more and more in the secondary and tertiary sectors.

However, agriculture, together with forestry, still involves the management of land resources. It continues to shape the environmental quality of the countryside. Land use changes can have an important impact not only on ecological integrity but also on aesthetic, visual amenities. Environmental quality has become a key factor in any assessment of rural living conditions, as has education, health and safety. Income figures are still important criteria for measuring rural and regional disparities. However, alone they are not sufficient to explain why people stay or leave rural places.

OECD-wide rural indicators must cover the whole range of rural concerns and should improve the understanding of those factors which influence the design, implementation and impact of rural policies. As a first step, it is useful to distinguish between those subjects which are of general importance and which provide the necessary background for any rural assessment and other more specialised subjects for which a more detailed analysis is required.

In the mid 1990s, the OECD identified the following general subjects, which covered the range of rural development (as well as urban) concerns in OECD countries:

- Population and migration
- Economic structure and performance
- Social well-being and equity
- Environment and sustainability

With the aim of covering these subjects with as much balance as possible, a basic set of rural indicators considered suitable for OECD purposes was selected.

The selection process for the indicators reflected the three principles developed earlier: **relevance, reliability and realisability**. It was based on an assessment of various aspects, such as:

- Likely territorial differences;

- Coverage of the analytical issues;
- Explanatory power of the indicator;
- Availability of disaggregated data.

It is clear that no single basic indicator could be accepted individually as a reasonable yardstick for an assessment of rural conditions and trends. Even comparatively narrow aspects of rural life, such as education and health, are not adequately reflected by such crude measures as the percentage of population with a completed post secondary education, or infant mortality. Nor can disparities in social well-being be measured simply in terms of income per capita.

Not all of the indicators in the basic set were equally accessible. In fact, the list included indicators with **three levels of availability**:

- Available in the short term
- Feasible in the mid term
- Desirable in the longer term

Thus, this basic set of rural indicators was significantly modified in the course of further work by taking out some of the variables or adding new ones. Improvements, especially with regard to data availability, appear particularly desirable in the field of rural indicators on social well-being and environmental quality. The basic set of rural indicators should, however, always be restricted to a limited number of statistics, sufficiently balanced to cover all of the four general subjects (OECD, 1996).

For its member countries, the OECD has devised a set of basic rural indicators classified into five main themes, see Focus Table VI.1.

FOCUS TABLE VI.1
OECD's basic rural development indicators classified by themes

Demographic statistics	Regional accounts	Innovation
Population by age and sex Average population Regional surface Population density	GDP Per capita GDP GVA by sector	R&D Expenditures by performing sector R&D Personnel by sector Educational attainments of the labour force Enrolment by level of education Employment in high-technology sectors High and medium high-technology manufacturing (as % of total manufacturing) Knowledge intensive services (as % of total services) High and medium high-technology manufacturing (as % of total employment) Knowledge intensive services (as % of total employment) Percentage of households with access to broadband
Social indicators	**Regional labour markets**	
Age-adjusted mortality rate Number of physicians Number of physicians per 1000 inhabitants Crime Volume of municipal waste Volume of municipal waste per capita Number of private vehicles Number of private vehicles per 100 inhabitants Voter turnout rate	Labour force by sex Employment by sex Employment by industry Unemployment by sex Unemployment rate Participation rate Long term unemployment incidence Business statistics Total number of establishments by industry Number of employees by industry	

Source: http://www.oecd.org/document/62/0,3343,en_2649_34413_36878718_1_1_1_1,00.html

In addition to, and in conjunction with, the work on the general subjects, other, **special subjects** may receive increasing attention. These could include rural employment and human resources, rural environment and amenities, innovation, rural infrastructure and access to services, rural tourism, small and medium sized enterprises (SMEs) and agriculture.

1) Population and migration

Basic information on the distribution of population over territory is indispensable for any rural analysis. Indications on population change, both natural and migratory, are of key importance in assessing past trends and future prospects of rural development. Territorially disaggregated population statistics differentiated by sex and age provide the foundations for a more detailed description or projection of rural problems and perspectives. More refined analysis of economic and social aspects of rural life often also requires information about the social organisation of the population at the level of households and local communities.

As for a basic set of indicators on population and migration the following were chosen:

- Population density
- Population change
- Population structure
- Households
- Communities

Indicators

Density: Despite the enormous differences in average national figures, population density is considered as a key indicator for rural analysis at the OECD level. It serves as the main criterion for the distinction of rural from urban in terms of both population and area. Density reflects territorial differences in settlement pattern. It also indicates difficulties in getting or providing access to infrastructure and services.

Change: population change for sub-national territorial units provides basic information for assessing trends in demographic geography. It is appropriate to distinguish at least the following components: total net change, the natural balance (calculated as births minus deaths) and net migration (total net change minus natural balance). It would also be useful to know, for example, if increasing net migration gains are due to increased in-migration or reduced out-migration. It is, however, very difficult to obtain such disaggregated statistics at regional and local levels.

Structures: Data on the distribution of population by sex and age provide the basis for the calculation of various demographic ratios. Indices relating the population in different age classes, such as the dependency ratio - those aged 0-14 plus those aged 65 and over divided by those aged 15-64 - or the vitality ratio – those aged 20-39 divided by those aged 60 and over - can be used for the description of demographic features. They are also valuable tools in socio-economic analysis as well as in the planning of infrastructure, such as schools or hospitals. For many purposes, it is also important to be able to distinguish population data by sex (OECD, 1996).

Households: Apart from statistics on categories of individual persons, information on the structure and changes in their social organisation can be important in learning more about territorial differences and developments. Household size and the share of children growing up in single parent households are variables that could indicate such differences.

Communities: In addition to family and household statistics, data on the share of the population living in local communities of different sizes can provide further detail to assess the degree of rurality or agglomeration of sub-national territorial units (OECD, 1996).

2) Economic structure and performance

For the basic set of rural indicators, economic information can best be obtained from territorially disaggregated statistics on labour force and employment as well as from regional accounts of production and investment.

Ensuring and promoting efficient rural production and employment is surely one of the main objectives of rural policies. Thus, data on employment and value added growth, or labour force participation and unemployment rates are key variables for assessing the state of, and the prospects for, rural development. Since improvement in productivity and efficiency of rural economies always requires structural adjustment and investment, information should also be made available on these subjects (OECD, 1996).

The following indicators were chosen to describe economic structure and performance:

- Labour force
- Employment
- Sectoral shares
- Productivity
- Investment

Indicators

Labour force: Labour Force statistics are of key importance for any assessment of economic development in different parts of a country. Change in total labour force and male and female participation rates are considered important indicators. For the purposes of rural analysis, it is crucial to clarify whether labour force and employment data are based on a measurement concept which refers to the “place of residence" or to the “place of work”.

Employment: Employment growth and unemployment rates are major rural policy concerns. However, it should be realised that unemployment rates are very crude measures, which are difficult to compare internationally. They are often based on different statistical concepts and registration practices. Proper assessment of the rural labour market situation would need more detailed information on the underlying past and future trends in job supply and demand. At the moment such data are difficult to obtain. In any case, what should be sought is more differentiated information on the nature of unemployment, by age, sex and duration.

Sectoral shares: Sectoral shares in employment and production (e.g. Gross Value Added) are usually examined to give a first indication of the main economic bases of an area. Knowledge of the shares of the three main sectors (primary, secondary, and tertiary) alone already provides valuable initial information. A further disaggregation would be more useful, however. This would allow analysts to distinguish between, for example, agriculture, forestry or fishing within the primary sector, or tourism from other activities in the services sector.

Productivity: If data are available for employment and production then productivity figures can easily be calculated. They would be important tools for the understanding of structural adjustments within and between the different parts of a country. Unfortunately, as of yet, the availability of territorially disaggregated production data is limited in many countries.

Investment: At present, the territorial detail of statistics on Gross Fixed Capital Formation is even less complete than for total production. However, since investment is crucial for any attempt to promote rural development it would appear appropriate to add an investment indicator to the basic list. Distinguishing among different types of investment, in particular, private and public, would be ideal.

3) Social well-being and equity

While territorial income distribution is an important rural policy concern, disparities in social well-being and equivalence in standards of living cannot be properly assessed in income terms alone. A whole series of other aspects determining quality of life should be taken into account. However, it has proved difficult to find social indicators which can reasonably be discussed in a sub-national and inter-national context at the same time.

The following indicators were chosen to describe important aspects of social well-being and equity:

- Income
- Housing
- Education
- Health
- Safety

Indicators

Income: Per capita income is probably the most commonly used measure to assess social disparities. Availability and quality of data sources is not, however, as good as one would expect. In Europe, most countries use Gross Domestic Product (GDP) per inhabitant as an indicator for regional income disparities. The smaller the area covered the more likely it is that this indicator will be misleading, because the GDP of an area is not necessarily produced only by the people living in that same area. The more important commuting becomes, the less meaningful the results. Since personal incomes depend to a large extent on redistribution through taxes and transfers, **figures on disposable personal income would surely be more appropriate indicators**. The purchasing power of income, however, may not be the same in every part of a country. This is even more true for international comparison, since current exchange rates do not always reflect the differences in purchasing power.

Housing: Housing conditions are an important component of a comprehensive monitoring of living conditions. The measurement and comparison of housing standards is difficult. However, the number of persons per room and the percentage of households having flush toilets appear to be variables that could provide initial indications of territorial differences in housing quality.

Education: Population with a higher level of education is another important aspect in describing territorial disparities. Since education systems differ considerably between countries, the most appropriate way to assess territorial differences would seem to be to measure the share of population over age 25 with a completed post secondary education.

Health and safety: Infant mortality and crime rates are, of course, not sufficient to adequately describe health and personal safety conditions. As part of a larger set of social indicators, however, they can serve as initial indicators for analysing territorial equivalence in qualities of life (OECD, 1996).

4) Environment and sustainability[1]

Environmental quality is an important resource for, as well as a result of, rural development. To be sustainable, rural development has to be sensitive to environmental changes and impact. It should support efforts to maintain ecological integrity. Sustainable rural development requires adequate integration of environmental considerations into private and public decision-making.

For many environmental issues availability of territorially differentiated statistics is still very limited. A major problem for the integration of socio-economic and environmental information in rural analysis is that the grids of territorial units used to collect and present the respective data often do not coincide.

The following basic indicators on environment and sustainability were chosen:

- Topography and climate
- Land use
- Habitats and species
- Soils and water
- Air quality

Indicators

Topography and climate: Topography and climate not only shape the natural conditions but also help determine the attractiveness of areas as places for living, working and recreation. Measurement which makes sense in an international context is not easy, however. In a first attempt, the share of mountain area (over 600 meters) and the vegetation period (growing days per year) were selected as potentially relevant indicators. As a synthetic indicator that refers to a site-specific mix of threshold values in temperature, precipitation, sunshine etc., the vegetation period is not only important for agriculture but is also relevant for assessing locational amenities for housing or tourism.

Land use: Data on land use, and in particular on changes in land use, can provide basic information not only on economic dynamics, e.g. in the farming sector, but also on basic environmental conditions. It is appropriate to distinguish between changes in total land use and changes in agricultural land use. In combination with other indicators, a growing share of arable land can be interpreted as an indication of increases in soil erosion and pollution risks. If, however, the initial share is low, a reduction of arable land could also be interpreted as a negative sign, because the diversity of landscapes and habitats may be diminishing.

Habitats and species: The share of protected areas is a commonly used indicator for measuring the existence of nature conservation values, although its reliability as an environmental indicator is not very strong. It could even be interpreted as an indicator for nature at risk because without a threat there is often no need to designate such areas. As a rural indicator, comparing primarily territorial differences, and in

[1]It is recognised that, in its present version, the Handbook does not cover indicators of landscape quality and amenity.

combination with other indicators, its explanatory value may be higher, however. An indicator for assessing species diversity is the share of endangered species. At the national level, information on the number of threatened species exists for most OECD Member countries. Information for sub-national units would be much more valuable. Providing such data, however, will not be easy in the short-run.

Soils and water: Conservation of soils and protection of ground and surface water are closely related issues. They have become key environmental concerns, in particular in many rural areas. Detailed maps on natural erosion risk do not yet exist for all OECD countries but could be developed in the mid term. It would be "a once and for all" exercise. Combined with data on land use changes, an erosion risk indicator could provide information for purposes of soil conservation and also for water protection, since soil erosion is a major source for surface water pollution. Ground water pollution in rural areas is to a large extent due to intensive agriculture. Since the problem is not just mineral fertiliser use, nor even just the total amount applied, nutrient balances (input minus withdrawal per hectare) should be calculated as indicators. Again data are not yet available for many countries but they could be developed within a reasonable time-frame.

Air quality: Ideally, balances of flows should also be established in order to assess air quality. While this may not be realistic in the short-term, emission data for air pollutants such as sulphur dioxide and carbon dioxide do differ considerably between rural and urban places. These may help to provide some initial information on territorial differences in environmental quality and sustainability (OECD, 1996).

5) The current situation

In 2010, the OECD Regional Database provides a set of comparable statistics and indicators on about 2000 regions in 30 countries. It currently encompasses yearly time-series for around 40 indicators of demography, economic accounts, labour market, social and innovation themes in the OECD member countries and other economies. Regions in OECD member countries have been classified according to two territorial levels (TL) to facilitate international comparability. The higher level (Territorial level 2) consists of macro-regions, while the lower level (Territorial level 3) is composed of micro-regions. In addition, OECD small regions (Territorial level 3) are classified according to their geography into predominantly rural, intermediate or predominantly urban. This typology of regions has been refined to take into account remoteness of rural regions: the extended typology comprises remote rural regions, rural regions close to a city, intermediate and predominantly urban regions. Chapter III of this Handbook contains further details.

In addition, the series *OECD Regions at a Glance* compares major regional patterns and trends across OECD countries and diffuses the statistical tools for the analysis of regional economies. The latest edition (OECD, 2009), focuses on regional innovation.

This information can be found on the OECD website at:
http://www.oecd.org/document/62/0,3343,en_2649_34413_36878718_1_1_1_1,00.html

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Focus on the European Union inventory of rural indicators

The departments of the European Commission, in close cooperation with Member States, have defined a list of indicators which address the three main objectives for that part of rural development policy which is operated through the "Second Pillar" of the Common Agricultural Policy. These objectives are: to improve the competitiveness of agriculture and forestry; to improve the environment, and; to enhance the quality of life in rural areas and promote diversification of economic activities through measures targeting the farm sector and other rural actors. Eurostat undertakes the compilation of the statistics used as indicators to monitor progress towards these objectives, based entirely on data already available either in the Member States or within Eurostat. In addition, Eurostat works with other Commission departments and Member States to develop new indicators of rural development within the EU. The Commission issues an annual report containing statistical and economic information on rural areas in the EU.

In addition, for the purpose of evaluating EU rural development programmes applied by Member States at national or regional levels in pursuit of the three main objectives of EU rural development policy, the Commission has set out a number of baseline indicators, divided into those of an "objective-related" and a "context-related" nature. These appear as part of the Common Monitoring and Evaluation Framework (CMEF) for rural development in the EU (European Commission, 2006). Evaluation reports are expected to contain statements of the baseline position and how the programmes have contributed to shifts in indicators over the period in which the programmes have been operated. As would be expected, there is considerable commonality between the statistics in the Commission's annual report on rural areas and the baseline indicators set out in the CMEF.

However, this approach to rural development does not take account of those aspects of rural conditions that Pillar II of the CAP does not attempt to address, though they may be the subject of other EU policies, notably that for regional development and cohesion. Thus housing and health of the general rural population do not feature in either lists.

A useful background to the present position is given by the PAIS and Hay's reports. This section then goes on the describe indicators used in the Commission's annual report on conditions in rural areas and the baseline indicators set for the round of Rural Development Programmes in the current programming period (2007-13).

1) Indicators suggested in the PAIS project report

The rural development domain of the EU's Proposal on Agri-Environmental Indicators (PAIS) aimed to produce an inventory of social and economic statistics used, or with the potential, to measure changes in the rural regions of Member States (Bryden, 2001). Information on indicators in the PAIS project was collected in a variety of ways, and from a variety of sources both within the administrations of Member States and within the academic community. As a result, it was possible to present information relating to **over 500 indicators** and descriptions of national approaches to Rural Development Indicators in nine Member States.

Following an assessment of these indicators, grouped according to various themes, and using standard criteria of sensitivity, analytical soundness, comprehensibility, reference value and policy relevance, **55 indicators were selected, considered to represent "good practice"** in addressing the needs of Rural Development policy makers and practitioners. The indicators are grouped under the headings shown below.

(i) Population and migration - demographic structure and evolution

An area's development depends on its population settlement and structure. For example, in areas of sparse settlement patterns it is difficult to achieve economies of scale in the production and/or delivery of goods and services. Both the level and change in population, and the resultant impact on resources, are often key development considerations. Permanent out-migration, for example, can drain labour, initiative, and income from rural areas. In several countries a key policy concern is high internal migration of young and educated people who are leaving rural municipalities and even regional centres and heading to the major city regions. It is clear that reproduction rates in most rural areas are now below urban rates, and that most rural areas depend on net inward migration for the maintenance of population. The scale and character (age-structure, class-structure, etc.) of this inward migration is both an important indicator of economic performance, and a crucial element in future demographics. It is clear that, outside the commuting zones of major towns and cities, the scale and nature of inward migration varies considerably between different rural areas.

The common parameters used in relation to population composition are age structure, gender and household status. Different age-cohorts are of particular relevance to rural areas. Rural areas are often characterised by top-heavy age structures as a result of selective in- and out-migration in the past. As such, indicators of the general well-being of rural areas include:

- Percent of population under 18
- Percent of population over 65
- Percent of young people aged 15-30

These examples are used principally for the justification of policy support and allocation of resources in the rural policy context, although they are of course important for planning the delivery of a whole range of services such as education, health care and so forth.

Clearly, demographic forces influence the size and structure of the labour market. As exemplified by EU policy, age cohorts are often used in the calculation of demographic labour market indices. This group of indicators, generally expressed in ratios, include measures of the:

- Dependency rate (by gender): (Population 0-14 + population over 64)/(Population 15-64)*100
- Social weight of young population: (Population 0-14)/(Population 15-64)*100
- Rejuvenation rate: (Population over 65)/(Population 0-14)*100
- Substitution rate: (Population 15-24)/(Population 55-64)*100
- Demographic labour market index: (Population 5-14)/(Population 55-64)*100

The last point gives an early indication of how many new jobs will be required in the next 10 years in order to prevent out-migration and population decline. The indicators are also disaggregated by gender.

At the most basic level, population change alone is a common and first indicator of development. Because of the strong relationship between development and population change, it is a popular indicator for identifying priority areas for special support in rural policy. The three principal components of population change are births, deaths and migration. The common indicators of population change, expressed as both ratios (per 1,000 of population) and in percent are:

- Net migration;
- Average annual population change (natural balance and migration);
- Decennial population change (annual rate)

(ii) Social well-being - quality of life

Quality of life factors, such as levels of crime, quality of, and access to, education and health services and the quality of the local environment, have also been shown to be important for inward and outward migration decisions in rural areas.

Many of these concerns are applicable to all territories, but some are of particular importance to rural areas. In addition, there are issues that are intrinsically more "rural" in nature such as employment in agriculture and forestry, specialised value-added activities, environmental and landscape management, and rural tourism and recreation. Monitoring regional change in these sectors is increasingly relevant in view of the evolving nature of rural employment and diversification policies.

The enhancement of individual welfare, the improvement of living and working conditions and reduction of social exclusion are principal aims of European social and cohesion policies. The set of issues covered include:

- Rural safety
- Rural environment
- Rural income
- Consumer oriented services
- Housing

(iii) Economic structure and performance

Diversification of the rural economy and the creation and maintenance of employment are critical issues for Europe's rural areas. One part of this debate concerns the "multifunctionality" of agriculture, based on the insight that agriculture is not limited to food production, but extends to environmental and wider socio-economic functions. Policy measures to diversify on- and off-farm income sources and to widen the economic base of rural economies are implemented through a plethora of national and regional policies and agencies. The tourism sector has acquired a wider significance as rural

areas transform into service-based economies. This is a sector that is able to utilise rural landscape amenities, as well as being associated with rural heritage and culture.

Strengthening the competitiveness of rural Europe does not only depend on the production resources available, but on a whole range of factors. These include access to an adequate transport and communications infrastructure that can enable rural areas to compete in the global economy, proximity to public services, conditions for entrepreneurship and effective support mechanisms.

Six issues have been identified as having important policy implications with regard to economic structure and diversification:

- Labour market structure and performance
- Enterprise and innovation
- Tourism and recreation
- Multifunctionality of agriculture, and
- Business infrastructure

The main indicators of economic structure pertain to both employment and output per employee within different economic sectors. The emphasis on these indicators is no longer on analysing the sectoral employment share of the primary sector in rural areas, but the degree to which the "new economy" is prevalent, including tourism-dependent sectors, producer services, high technology manufacturing and quality value-added activities.

The Rural Labour Market: The following change indicators are applied across all Member States at regional level (NUTS2 or 3 level)[1]:

- Unemployment rate;
- Participation rate;
- Self-employment;
- Long-term unemployment change;
- Educational attainment rate.

Enterprise and Innovation: Business vitality, in terms of density of businesses and turnover of businesses, can have a direct impact on the economic well-being of a territory. A focus on local entrepreneurship is concurrent throughout the EU and many national regional development policies.

Business Infrastructure:

Level of provision:

- Number of internet service providers (ISPs) within a territory;
- Provision of Integrated Service Digital Network (ISDN) and Asymmetric Digital Subscriber Line (ADSL) in a territory based on capacity and speed;

[1]NUTS = Nomenclature of Statistical Territorial Units. See Chapter III of this Handbook.

- Annual subscription cost of ISDN, ADSL and other broadband technology.

Level of usage;

- Number of ISDN, ADSL, cable subscribers by businesses within a territory;
- Number of Internet hosts and business subscribers to digital services;
- Turnover of business generated from the internet;
- Number of home and work-based internet users (and e-mail).

Tourism in Rural Development: Tourism is now viewed as a key rural industry within Europe. The countryside is recognised as an important resource for leisure pursuits for the domestic market, in addition to overseas visitors. Yet the indicators that are used to measure the supply and demand of tourism in rural areas continue to be limited. Tourism, as an activity, affects a range of policy areas: employment, regional development, education, environment, consumer protection, health, safety, culture, new technology, transport, finance and taxation. However, tourism remains difficult to define and measure, particularly in terms of its contribution to the national economy given that many of the commodities produced and consumed are subsumed within other elements and sectoral shares in national accounting systems.

The major statistics collected on tourism can be divided into supply and demand. Different tourism dimensions can be summarised as follows:

- Physical features of consumption
- Physical features of supply
- Employment features
- Other monetary features, e.g. tourist expenditure

Multifunctionality of agriculture: The multiple functions of agriculture (MFA) are critical issues for rural development indicators to capture and measure. As a sector, concerns relate to population maintenance, employment, landscape, environmental quality, and tourism and other non-production-related functions. Under rural development, research focuses on the social and economic functions of agriculture, largely excluding landscape and environmental quality, although these are critical dimensions of MFA. There are three key areas that socio-economic indicators can address**:** farm household employment; agricultural diversification and agricultural productivity.

The diversification of **farm household employment** into non-farming activities, where the unit of analysis is the farm household, constitutes one set of indicators. Under tourism, indicators of the role of tourism-related enterprises on farms have been highlighted. Similarly, farm household employment and income from other non-farming enterprises are being measured. Measurement of changes in employment, time input, and turnover generated from alternative activities on assisted holdings, compared to non assisted holdings, will be key evaluation indicators for the programmes.

A second set of indicators concerns the **diversification of primary production** on the farm holding, reflected in measurements of the uptake of agri-environment schemes, forestry and organic aid schemes. Usually calculated on a number of holdings and area basis, the indicators are expressed for policy-supported holdings. For example, typical indicators of organic farming include "certified organic and in-conversion land area and holdings", the percentage of utilisable agricultural area (UAA) devoted to organic farming, and its evolution.

Although there is a wealth of efforts to measure the impact of agriculture on the environment, there have been fewer efforts to capture the impact that agriculture's habitat and species maintenance efforts have had on public goods. Indicators of habitats and species are currently restricted to proxy measures, such as the area of national, EU or Internationally designated areas. Although not used in this context, the population of farm birds, for example, could be an indirect indicator of farming's multifunctional role, based on the existence of values stemming from an altruistic concern for the environment (although this may be more applicable to urban residents, than rural). Other examples could include area of farmland maintained as woodland, plant diversity, hedgerows and organically farmed area. Difficulty in providing any scientifically sound calculation of the value of public goods may, in part, explain why such indicators have been not much utilised. However, it is worth noting that, under the EU Common Monitoring and Evaluation Framework applying to EU Rural Development Programmes in the period 2007-13, farmland bird numbers are being taken as a proxy for biodiversity in assessing the impact of such policy interventions (European Commission, 2006).

A third set of indicators concerns measurements of **farm structure (inputs) and productivity** (output). Farm employment structure by EU land use categories are the most common indicators of resources, along with the form of farm tenure and total income from farming. Farm productivity is measured using output per hectare and output per employee and includes changes over time. There is little variation in the indicators used between countries, although some are able to produce data at finer spatial scales than others.

The proposed set of indicators is shown in Focus Table VI.2 in the Annex at the end of this document. This table could very well be amended to include columns for the geographic classes (such as "rural" and "urban" or "predominantly rural regions," "intermediate regions" and "predominantly urban regions") because every indicator applies equally to each type of geography.

2) Indicators suggested in the Hay report

The Hay report (2002) *Indicators and Rural Development* stresses that there are significant problems concerning data availability even though it was not expected that data for all the variables would, in the first instance, exist at a NUTS3 level or lower.

Much of the data, however, does not go beyond NUTS2. This is a recurring problem for many of the required variables, with data for several only provided/collected at country level (NUTS0) rather than district level (NUTS3) or even regional level (NUTS2). In fact, for a total of fifty-eight indicators, with the current data available, only seven of these can be calculated at NUTS3.

Even when data is collected at NUTS2 or NUTS3 level there are problems with lack of harmonisation. Data may exist, for example, for some countries in the years 1994 and 1996, and yet, for others it is only available for 1995 and 1997, thus making a country comparison for the same year impossible.

To add further confusion to the issue, in the years that NUTS3 or NUTS2 data exists there are often internal country data gaps. Although data may be provided at either NUTS3/2 for a certain year, it might not be a "full set", with possibly one fifth of the data missing.

In addition, for certain variables some countries simply do not provide data - for any year or at any NUTS level. In such cases a study of the EU-15 becomes instead a study of the EU-9 or EU-10. What makes this issue more difficult in terms of a country comparison is the fact that the data for the remaining EU-9 or EU-10 will contain many of the problems mentioned above and, therefore, data will be neither complete nor satisfactory for the purposes of analysis.

Focus Table VI.3 in the Annex lists the indicators suggested in the Hay report. Again, these indicators could also be applied to characterize urban areas.

Based on the Hay report and the PAIS project, themes and indicators that were selected by Eurostat are shown in Focus Table VI.4 in the Annex.

3) Statistics used in the annual report "Rural Development in the European Union: Statistical and Economic Information"

The Directorate-General for Agriculture and Rural Development now issues an annual report on the state of conditions in rural areas. Aspects now cover:

- The importance of rural areas (in terms of territory, population, employment and economic activity)
- The socio-economic situation
- Sectoral economic indicators
- The environment
- Diversification and quality of life
- The development of the LEADER approach to rural development (a bottom-up system that concentrates on the use of local resources and networks).

A list of the indicators that appear in the 2009 Rural Development Report is given in Focus Table VI.5 in the Annex.

4) Common indicators for monitoring rural development programmes

The Regulations that enabled EU funds to be used to support Rural Development Programmes (RDPs) in the period 2000-06 required Member States and regions to undertake evaluations of their rural development programmes, based on common evaluation questions (CEQs) and guidance which comprised *inter alia* common indicators by which these questions could be addressed. Three stages of evaluation were

required – the *ex ante*, the mid-term, and the *ex post*. Arguably, the most influential in terms of shaping the design of the next round of RDPs was the mid-term evaluation (MTE), which had to be submitted to the Commission no later than the end of 2003 (European Commission, 2003a; 2003b). The purpose of this was to assess how well the assistance had performed with regard to the achievement of objectives *vis-à-vis* the different categories of beneficiaries (European Commission, 2002).

For RDPs in the programming period 2007-13 a similar set of evaluations were mandated. Guidance in the form of a Common Monitoring and Evaluation Framework (CMEF), again set CEQs and indicators for baselines (which cover economic, social and environmental aspects of the areas in which the RDPs operate), outputs, results and impacts (see European Commission (2006) and Chapter IV of this Handbook). Compared with the earlier period, evaluators of 2007-13 RDPs have been left a greater degree of flexibility in how answers to the questions are generated.

Baseline indicators are divided into those that are objective-related and those that are context-related. The complete list of indicators is given in the CMEF documentation (see in particular Annex 3 "Indicator guidance" sections F (common indicator list) and G (baseline indicators fiches, which gives a detailed description of them). For the period 2007-13, while common evaluation questions have been set and baseline, output, results and impact indicators prescribed, evaluators are left a greater degree of flexibility in how answers to the questions are generated.

http://ec.europa.eu/agriculture/rur/eval/index_en.htm

While there is a great deal of common ground between the indicators used to evaluate the performance of RDPs and rural statistics. Evaluation also requires additional indicators on the process by which rural development policy is applied (such as the number of beneficiaries under the various schemes) that would not normally be regarded as rural statistics.

The guidelines for the evaluations consider issues such as quality of the data and the findings, and the sampling techniques and sources that are used to collect the data. Moreover, it is required that optimum use be made of so-called secondary data, e.g. data that exist already, for example from the monitoring system or in rural statistics. If primary data are used they must be based on representative sampling techniques.

Focus Table VI.6 in the Annex below contains a list of the baseline indicators applied in the period 2007-2013.

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ANNEX: EUROPEAN UNION RURAL INDICATORS

FOCUS TABLE VI.2
Key Rural Development Indicators suggested in the PAIS report

THEME	ISSUE	INDICATOR NAME	No.
Population and Migration	Demography	Population density	1
		% population aged 16 or under	2
		% population aged 65 or over	3
		Infant mortality rate	4
	Population Change	Average annual population change	5
		Regional net migration balance	6
Social well-being	Service provision	Accessibility to public services	7[i]
	Employment	% resident workforce working outside area	8
		Rural employment rate	9[ii]
	Quality of employment	% low skilled and high skilled workers	10[iii]
		% of part-time workers	11
		% of employees on short-term contract and long-term contracts	12
		% workforce self-employed	13
	Income	% of households in receipt of social payments	14
		Average earnings per capita	15
		Household disposable income	16
	Housing accessibility	No. of second homes	17
		Average house price deviation from national average	18
		Affordability gap[iv]	19
		Rate of transactions (house sales)	20
		% turnover in rented sector	21

THEME	ISSUE	INDICATOR NAME	No.
Economic Structure & Performance (competitiveness)	Enterprise	Average no. of patents	22
		No. of patent applications	23
		R&D expenditure	24
		New business formation rate	25
		GVA per capita in manufacturing	26
		% GVA in high-technology sectors	27
	Human capital	No. of university students	28
		Share of workforce with higher qualification	29
	Business infrastructure	Supply of broadband services	30
Economic Structure & Performance (diversification of rural economies)	Sectoral shares	Sectoral employment shares: high and low tech manufacturing	31
		Sectoral employment shares: shift share analysis	32
		% foreign owned companies	33
		% employment in foreign owned companies by sector (manufacturing and tradable services)	34
		Enterprise size structure by employee numbers	35
		Net revenue by enterprise sector	36
	Farm households	% share of pluriactive farm households	37
		% income from non-farming activities	38
		% income from off-farm activities	39
	Tourism & recreation	No. of bedspaces per 1,000 inhabitants	40
		No. employed in rural tourism accommodation providers	41
		Accommodation occupancy rate	42
		Share of rural enterprises in total tourism turnover	43

THEME	ISSUE	INDICATOR NAME	No.
Economic Structure & Performance (Addressing the primary sector)	Agriculture	Farm size distribution (area/output)	44
		Total gross output	45
		Gross value added	46
		Farm net value added per holding, hectare and AWU[v]	47
		Farm business employment	48
	Forestry	Employment (permanent/temporary)	49
		% area forested (on-farm/off-farm)	50
		Total gross output	50
		Total value added	51
		Value of total annual gross fellings	52
	Fisheries, aquaculture & fish processing	Total gross output	53
		Total value added (% of GDP)	54
		Employment by home port	55
		Value of landings (by local registered boats)	56
		CFP Dependency Indicator[vi]	57

FOCUS TABLE VI.3
Indicators suggested in the Hay report

1. Demographic Characteristics and Changes

ISSUES	INDICATORS	VARIABLES
Population Change	Average Population	Population Year 1, Population Year 2
Population Density	Population Density	Population Year 1, Area (Square km)
Age Structure	Elderly and Young Population	% of 55+ to Total Population
		% of Age Group 14 and Under to Total Population
		% of Age Group 14 and Under to Age Group 55+
Migration	Age Specific Migration	Inter-regional Migration
Natural Population Change	Birth/Death Ratio and % Change	Total Deaths Year 1, Total Deaths Year 2 Total Births Year 1, Total Births Year 2

2. Employment and Human Capital

ISSUES	INDICATORS	VARIABLES
Human Capital	Education Levels	% Population Aged 25-59 Having Attained Only Secondary Education or Less
Change in Employment	Employment Growth	Total Employment by Age and Sex Yr 1 Total Employment by Age and Sex Yr 2
Employment and Economic Activity	Employment Rate	Employed Persons Aged 15-64/Working Age Population
	Unemployment Level	Unemployment Rate – Total Population
	Activity Rate	Active Population/Working Population
Opportunities for Women	Employment Rate By Gender	Employed Females Aged 15-64/Working Age Population – National Level Employed Males Aged 15-64/Working Age Population – National Employed Females Aged 15-64/Working Age Population – Regional Employed Males Aged 15-64/Working Age Population – Regional

3. Welfare, Income and Quality of Life

ISSUE	INDICATOR	VARIABLES
Economic Prosperity	Average income and growth/decline	GDP Per Capita Yr 1, GDP Per Capita Yr 1, GDP Per Capita Yr 2
Quality of Work Opportunities	Proportion of Employment Part-Time or Seasonal	% of Part-Time Employment as % of Total Employment % of Seasonal Employed as % of Total Employment
Access to Services	Proximity to hospital, school, postal services, bank	
Deprivation	Jobless Households Dependence Upon State Aid	Share of Households in Which No Member is in Employment Poverty rate before social transfers (original income) Poverty rate after social transfers (total income) % Income From Social Transfers
Health	Life Expectancy at Birth	Life Expectancy of Females at Birth Life Expectancy of Males at Birth

4. Agricultural Adjustment and Structural Change

ISSUES	INDICATORS	VARIABLES
Changing Agricultural Employment	Agricultural Labour Force and Change	Total Agricultural Labour Force in AWU Yr 1 Total Agricultural Labour Force in AWU Yr 2
	Changing Intensity	Average Number of AWU by Holding/Total Holdings Average Number of AWU by 100ha/Total Holdings Number of AWU/Total UAA Yr 1, Yr 2
	Family Labour	Total Family Labour Force in AWU/ Total Labour Force in AWU
Pluriactivity	Holders With Other Gainful Activities	Holder's Being a Natural Person: Work Time>0to<25% - persons Holder's Being a Natural Person: Work Time>25to<50% - persons Holder's Being a Natural Person: Work Time>50to<75% - persons *- as a % of -* Holder's Being a Natural Person: Sex = Female (Persons) Holder's Being a Natural Person: Sex = Male (Persons)
Ageing of Farmers	Proportion of Older Holders and Change	Holder's Being a Natural Person 55-64 years AWU Yr 1, Yr 2 Holder's Being a Natural Person 65+ AWU, Yr 1, Yr 2/ Holder's Being a Natural Person AWU

ISSUE	INDICATOR	VARIABLES
Agricultural Viability	Income From Agriculture and % Change	Average Standard Gross Margin per Hectare
Structure of Agricultural Holdings	Farm Size (Business Size)	Total UAA/ Total Agricultural Area
	Farm Size (Area)	Total Standard Gross Margin (ESU)/ Total Number of Holdings
	Intensity	% of Agricultural Area as Irrigated Area
		Standard Gross Margin per Annual Work Unit
		SGM per UAA
	Importance of Livestock	ESUs from Livestock

5. Multi-Functionality of Agriculture

ISSUES	INDICATORS	VARIABLES
Uptake of Agricultural Policy	Farms with Agri-Environment Schemes	% of Holdings in Area With Agri-Environmental Scheme
	Farms in Designated Areas	% Holdings in Area Covered by Designated Area Status
Importance of Forestry	% of Farms with Forests	Number of Holdings With Woodland/ Total Number of Holdings
Farms with Pluriactivity	Holders With Other Gainful Activities	Holder's Being a Natural Person: Work Time>0to<25% - persons Holder's Being a Natural Person: Work Time>25to<50% - persons Holder's Being a Natural Person: Work Time>50to<75% - persons *- as % of -* Holder's Being a Natural Person: Sex = Female - persons Holder's Being a Natural Person: Sex = Male – persons
Uptake of Organic Farming	% of Organic Farms In Region	Total Number of Holdings/ Number of Organic Farms

6. Rural Economic Diversification

ISSUES	INDICATORS	VARIABLES
Dominance of Primary Sector Activities?	Relative Importance of Primary Sector	Total Employment in Primary Sector/Total Employment
Development of New Activities	Employment in manufacturing etc.	Total Employment in Secondary Sector/Total Employment
	Employment in business etc.	Total Employment in Tertiary Sector/Total Employment
	Value Added Locally	% of Labour Force in Food Processing
	Accommodation Capacity and Change	Number of Tourist Beds in Region
		% Employed in Restaurants and Hotels Year 1, % Employed in Restaurants and Hotels Year 2
Dependence on Public Sector Employment	Strength of the Public Sector	% Employed in Public Sector

7. Innovation and Enterprise

ISSUES	INDICATORS	VARIABLES
Innovation and Research	Patent Applications	Total International Patent Applications Per Inhabitant
	Research and Development Expenditure	% GDP Spent on Research and Development – Government Sector
		% GDP Spent on Research and Development – Business Sector
		% GDP Spent on Research and Development – Higher Education Sector
New Enterprise	Investment and Creation of New Business	Gross Fixed Capital Formation By the Private Sector as % of GDP
		Gross Business Start-Ups
Importance of Telecommunications	ICT Expenditure	Information & Communications Technology Expenditure/ GDP
	Citizens With Internet Access at Home	% of Citizens with Internet Access Total Population

8. Policy[2]

ISSUES	INDICATORS	VARIABLES

[2]The main policy areas would include: Structural and Cohesion Policy, The Rural Development Regulation, LEADER +, and Mountain and Less-Favoured Areas.

Region Eligible for EU Aid	Presence of Objective 1 or 2 in Region	
Importance of Rural Development Regulation	Uptake of Rural Development Regulation	EU Spending on Agricultural Support - the "Rural Development Regulation"
		National Spending on Agricultural Support Number of Approved RDR Approved Applications in Region Amount of Money Awarded to Region for Uptake of the RDR Amount Allocated to Article 33 (Non-Agricultural Measures)
Region Eligible for LEADER Funding	Use of LEADER II and LEADER +	EU Spending on LEADER II and LEADER+
		National Spending on LEADER II and LEADER+
		Presence of 1 or More LEADER Local Action Groups Within Territory
Mountain Areas & Less Favoured Areas	Proportion of Area Covered by Mountain and Less Favoured Area Status	% of Area Covered by Less Favoured Area Status
		% of Area Classified as Mountainous
Farmers leaving agriculture prematurely	Farmer Retirement Scheme	% uptake of farmer retirement scheme
Dependency of Farm-Payments	CAP Support	CAP Support/Total SGM

9. Rural Environment and Landscapes

ISSUES	INDICATORS	VARIABLES
Type and Scale of Farming	Average Farm Size (Area)	Total Standard Gross Margin (ESU)/ Total Number of Holdings
	Main Farm Type	(See Farm Type Classification in Farm Structure Survey)
Levels of Exploitation of Natural Resources	% of Farm with Forest	Number of Holdings With Woodland/ Total Number of Holdings
Landscape and Biodiversity	Environmental Designations	% of Area Covered by Special Protection Status % of Area Covered by EC Birds Directive % of Area Covered by EC Natural Habitats Directive

10. Infrastructure and Peripherality

ISSUES	INDICATORS	VARIABLES
Peripherality	Peripherality Index	
	Road Quality	Presence of Motorway Link to Nearest Large Town
	Rail Transport	Presence of Rail Link to Nearest Large Town
	Existence of Airport in Region	Presence of International Airport in Region Presence of Airport Serving National Destinations in Region
	Distance to Airport from Centre Point of Region	

FOCUS TABLE VI.4
Specification of Eurostat indicators (as laid down in an ESTAT discussion document)

1. Demographic data

Level of geographic detail: NUTS5

ISSUE	INDICATOR	VARIABLE
Population change	Average total population (This is for a first screening, if there is a change, one should go deeper)	Population year 1 Population year 2
Migration	Age specific migration (Active out and in movement has reasons Who migrates and why?)	In migration Out migration Across NUTS5 borders
Natural population change	Birth/death ratio and % change (Reflects also the age structure and social well being)	Total births year 1 Total births year 2 Total deaths year 1 Total deaths year 2
Population density change	Population density year 1 Population density year 2 (Pressure on open space?)	Population year Area in km²
Age structure changes	Age structure year 1 Age structure year 2 (Report e.g. ageing of the population. The ratio 5 – 14 and 55 -64 builds the indicator "demographic labour pressure")	Minimum 5 – 14 years and 55 – 64 and 65 and older Number of households

2. Employment and economic data

Level of geographic detail:

ISSUE	INDICATOR	VARIABLE
Forms of employment	Percentage of self-employed persons (This rate is higher where small and medium sized businesses exist; generally the rate is also higher in rural areas due to farmers etc.)	Number of self-employed persons
Importance of different sectors	Employment in primary, secondary and tertiary sector (Is the area shaped by agricultural activities; is there a change to the tertiary sector visible already)	Average total employment in primary/secondary/tertiary sector (By NACE subsection at the work place)
Importance of public sector	Percentage of employment in public sector	Employment in public sector Total employment
Human capital	Educational level of employees / self-employed people (Is the workforce well educated?)	Number of people with higher education (According to the International Standard Classification of Education , ISCED)
Change in employment	Employment growth	Total employment year 1 Total employment year 2 (By age and gender)
Relative changes of employment	Employment rate year 1 Employment rate year 2 (Incl. part time employment and seasonal employment)	Employed persons aged 15-64 (By gender)
Relative changes of unemployment	Unemployment rate year 1; Unemployment rate year 2	Unemployed persons aged 15-64 (By age and gender)
Potentially available human resources	Activity rate year 1 Activity rate year 2	Active population / working population
Importance of commuting	*Change in commuter figures* (Might give information on the function of the region)	Number of commuters (Number of people crossing NUTS5 borders regularly)
Dynamic of the local economy	Business formation rate (Is the area attractive for start-ups? Are incentives given for new businesses?)	Total number of businesses Number of new businesses
Importance of tourism	Importance of tourism (Covers both agri-tourism and conventional tourism)	Number of tourist beds Number of over night stays

3. Infrastructure data

Level of geographic detail:

ISSUE	INDICATOR	VARIABLE
Accessibility of the region	Road network, railway, airport (Accessibility of the region; in certain regions of Europe the railway network becomes smaller, e.g. certain connections are closed)	Distance in km to next motorway or similar road Distance to next railway station distance to next airport (From gravity points? Or time to be spend to reach sth.)
Development of transport infrastructure	Investments in transport network last 5 years	EU and national subsidies spent in millions of Euros
Access to services	Proximity to services (banks, post, shops, restaurants, schools, doctors, hospitals, pharmacy etc.) (Attractiveness of the region)	Presence and distance to them
Availability of telecommunications	Internet access, mobile phone cover (These are basic parameters for new businesses)	Number of households /businesses with internet access number of registered mobile phones
Potential for new business formation	Availability of land for industry and other businesses	Area of industrial estates in ha

4. Welfare data

Level of geographic detail:

ISSUE	INDICATOR	VARIABLE
Deprivation	Dependence upon social aid (Difficult variable because the threshold to receive social aid varies between member states)	Number of people receiving social aid
Quality of life?	Percentage of people living in self owned property	Total number of people living in own property Total number of people
	Poverty rates	

5. Agriculture and structural change

Level of geographic detail:

ISSUE	INDICATOR	VARIABLE
	Structure of Agricultural Holdings	
	Total number of holdings Average age of owners of holdings	
	Farm Size (area),	Average AWU per holding % of area irrigated
	Intensity	% of area under ecological farming LSUs per ha
	Main farm type	According to the classification of the FSS
	Importance of family labour Percentage of part time farmers	
Pluriactivity		Holders with other gainful activities
Importance of Forestry	Percentage of farms with forests	Total number of farms Number of farms with forest

FOCUS TABLE VI.5
Indicators used in Rural Development in the European Union: Statistical and Economic Information Report 2009

SECTION	CMEF	INDICATOR	N.	MEASUREMENT
3.1 Importance of rural areas	C1	Designation of rural areas	3.1.1	Designation of rural areas with OECD methodology
	C2	Importance of rural areas	3.1.2.1	% territory in rural areas
			3.1.2.2	% population in rural ares
			3.1.2.3	% GVA in rural areas
			3.1.2.4	% employment in rural areas
3.2 Socio-economic situation in rural areas	C17	Population density	3.2.1	Population density
	C18	Age structure	3.2.2	% people aged (0-14) y.o./(15-64)y.o./ > 65 y.o. in total population
	O1	Economic development	3.2.3	GDP/capita (EU-25 = 100)
	C19	Structure of the Economy	3.2.4	%GVA by branch (Primary/Secondary/Tertiary sector)
	C20	Structure of Employment	3.2.5	% employment by branch (Primary/Secondary/Tertiary sector)
	O2	Employment rate	3.2.6	Employed persons as a share of total population of the same age class
	O3	Unemployment	3.2.7	Rate of unemployment (% active population)
	C21	long-term unemployment	3.2.8	% Long-term unemployment (as a share of active population)

SECTION	CMEF	INDICATOR	N.	MEASUREMENT
3.3 Sectoral economic indicators	O8	Employment development of primary sector	3.3.1	Employment in primary sector
	O9	Economic development of primary sector	3.3.2	GVA in primary sector
	C3	Agricultural land use	3.3.3	% arable areas/permanent grass/permanent crops
	C4	Farm structure	3.3.4.1	Number of farms
			3.3.4.2	Utilized agricultural area
			3.3.4.3	Average area farm size and distribution
			3.3.4.4	Average economic farms size and distribution
			3.3.4.5	Labour force
	O16	Importance of semi-subsistence farming in NMS	3.3.5	Number of farms < 1 ESU
	O4	Training and education in agriculture	3.3.6	% farms with basic and full education attained
	O5	Age structure in agriculture	3.3.7	Ratio: % farmers <E61/ > = 55 years old
	O6	Labour productivity in agriculture	3.3.8	GVA/AWU - total and by sector
	O7	Gross fixed capital formation in agriculture	3.3.9	GFCF in agriculture
	O10	Labour productivity in food industry	3.3.10	GVA/persons employed in food industry
	O11	Gross gixed capital formation in food industry	3.3.11	GFCF in food industry
	O12	Employment development in food industry	3.3.12	Employment in food industry
	O13	Economic development of food industry	3.3.13	GVA in food industry
	C5	Forestry structure	3.3.14.1	Area of forest available for wood supply (FAWS)
			3.3.14.2	Ownership (% areas of FAES under "eligible" ownership)
			3.3.14.3	Average size of private holding (FOWL)
	C6	Forest productivity	3.3.15	Average net annual volume increment (FAWS)
	O14	Labour productivity in forestry	3.3.16	GVA/person employed in forestry
	O15	Gross fixed capital formation in forestry	3.3.17	GFCF in forestry

SECTION	CMEF	INDICATOR	N.	MEASUREMENT
3.4 Environment	C7	Land cover	3.4.1	% area in agricultural/forest/natural/artificial
	C8	LFA	3.4.2	% UUA in non LFA/LFA mountain/other LFA/LFA with specific handicaps
	C9	Areas of extensive africulture	3.4.3.1	% UAA for extensive arable crops
			3.4.3.2	% UAA for extensive grazing
	C10	Natura 2000 area	3.4.4.1	% territory under Natura 2000
			3.4.4.2	% UAA under Natura 2000
			3.4.4.3	% UAA for extensive arable crops
	O17	Biodiversity: Population of farmland birds	3.4.5	Trends of index of population of farmland birds
	O18	Biodiversity: High Nature value farmland areas	3.4.6	UAA of High Nature Value farmland areas
	O19	Biodiversity: Tree spsecies composition	3.4.7	Distribution of species group by area of FOWL (% coniferous/ % broadleaved/ %mixed)
	C11	Biodiversity: Protected forest	3.4.8	% FOWL protected to conserve biodiversity, landscapes and specific natural elements (MCPFE 4.9, classes 1.1, 1.2, 1.3 & 2)
	C12	Development of forest areas	3.4.9	Average annual increase of forest and other wooded land areas
	C13	Forest ecosystem healt	3.4.10	% trees / conifers / broadleaved in defoliation classes 2-4
	C14	Water quality	3.4.11	% territory designated as Nitrate Vulnerable Zone
	O20	Water quality: Gross Nutrient Balance	3.4.12.1	Surplus of nitrogen in kg/ha
			3.4.12.2	Surplus of phosphorus in kg/ha
	O21	Water quality: Pollution by nitrates and pesticides	3.4.13.1	Annual trends in the concentrations of nitrate in ground and surface waters
			3.4.13.2	Annual trends in the concentrations of pesticides in ground and surface waters
	C15	Water use	3.4.14	% irrigated UAA
	C16	Protective forests concerning primarily soil and water	3.4.15	FOWL area managed primarily for soil & water protection (MCPFE 5.1 class 3.1)
	O22	Soil: Areas at risk of soil erosion	3.4.16	Areas at risk of soil erosion (classes of T/ha/year)
	O23	Soil: Organic farming	3.4.17	UAA under organic farming
	O24	Climate change: Production of renewable energy from agriculture and forestry	3.4.18.1	Production of renewable energy from agriculture (ktoe)
			3.4.18.2	Production of renewable energy from forestry (ktoe)

	O25	Climate change: UAA devoted to renweable energy	3.4.19	UAA devoted to energy and biomass crops
	O26	Climate change: GHG emissions from agriculture	3.4.20	Agricultural emissions of GHG (ktons of CO2 eq.)
3.5 Diversification and quality of life in the different categories of areas	O27	Farmers with other gainful activity	3.5.1	% holders with other gainful activity
	O28	Employment development of non-agricultural sector	3.5.2	Employment in secondary and tertiary sectors
	O29	Economic development of non-agricultural sector	3.5.3	GVA in secondary and tertiary sectors
	O30	Self-employment development	3.5.4	Self-employed persons
	O31	Tourism infrastructure in rural area	3.5.5	Number of bedplaces (in hotels, campings, holiday dwellings, etc.)
	C23	Internet infrastructure	3.5.6	DSL coverage
	O32	Internet take-up in rural areas	3.5.7	% population having subscribed to DSL internet
	O33	Development of services sector	3.5.8	% GVA in services
	O34	Net migration	3.5.9	Net migration rate
	C22	Educational attainment	3.5.10	% adults (25_64) with Medium & High educational attainment
	O35	Life-long learning in rural areas	3.5.11	% of population of adults participating in education and training
AXIS 4, LEADER	O36	Development of Local Action Groups	3.5.12	Share of population covered by Local Action Groups

Source: European Commission (2009). *Rural Development in the European Union: Statistical and Economic Information Report 2009.* Directorate-General for Agriculture and Rural Development.

FOCUS TABLE VI.6
EU Common Monitoring and Evaluation Framework for Rural Development Programmes in the period 2007-13. Baseline indicators (objective and context related)

a. Objective related baseline indicators

AXIS			INDICATORS	MEASUREMENT
Horizontal	*	1	Economic development	GDP/capita (EU-25 = 100)
	*	2	Employment rate	Employed persons as a share of total population of the same age class
	*	3	Unemployment	Rate of unemployment (% active population)
AXIS 1 Competitiveness	*	4	Training and education in agriculture	% farmers with basic and full education attained
		5	Age structure in agriculture	Ratio : % farmers < 35 / >= 55 years old
	*	6	Labour productivity in agriculture	GVA / AWU - total and by sector.
		7	Gross fixed capital formation in agriculture	GFCF in agriculture
		8	Employment development of primary sector	Employment in primary sector
		9	Economic development of primary sector	GVA in primary sector
	*	10	Labour productivity in food industry	GVA / people employed in food industry
		11	Gross fixed capital formation in food industry	GFCF in food industry
		12	Employment development in food industry	Employment in food industry
		13	Economic development of food industry	GVA in food industry
	*	14	Labour productivity in forestry	GVA / people employed in forestry
		15	Gross fixed capital formation in forestry	GFCF in forestry
		16	Importance of semi-subsistence farming in NMS	Number of farms < 1 ESU
AXIS 2 Environment	*	17	Biodiversity: Population of farmland birds	Trends of index of population of farmland birds

	*	18	Biodiversity: High Nature Value farmland and forestry	UAA of High Nature Value Farmland
		19	Biodiversity: Tree species composition	Distribution of species group by area of FOWL (% coniferous/% broadleaved/%mixed)
	*	20	Water quality: Gross Nutrient Balances	Surplus of nitrogen in kg/ha Surplus of phosphorus in kg/ha
		21	Water quality: Pollution by nitrates and pesticides	Annual trends in the concentrations of nitrate in ground and surface waters Annual trends in the concentrations of pesticides in ground and surface waters
		22	Soil: Areas at risk of soil erosion	Areas at risk of soil erosion (classes of T/ha/year)
		23	Soil: Organic farming	UAA under organic farming
	*	24	Climate change: Production of renewable energy from agriculture and forestry	Production of renewable energy from agriculture (ktoe) Production of renewable energy from forestry (ktoe)
		25	Climate change: UAA devoted to renewable energy	UAA devoted to energy and biomass crops
		26	Climate change: GHG emissions from agriculture	Agricultural emissions of GHG (ktoe)
AXIS 3 Wider rural development	*	27	Farmers with other gainful activity	% holders with other gainful activity
	*	28	Employment development of non-agricultural sector	Employment in secondary and tertiary sectors
	*	29	Economic development of non-agricultural sector	GVA in secondary and tertiary sectors
	*	30	Self-employment development	Self-employed persons
		31	Tourism infrastructure in rural area	Number of bedplaces (in hotels, campings, holiday dwellings, etc.)
	*	32	Internet take-up in rural areas	% population having subscribed to DSL internet
	*	33	Development of services sector	% GVA in services
		34	Net migration	Net migration rate
	*	35	Life-long learning in rural areas	% of population of adults participating in education and training

AXIS 4 LEADER	*	36	Development of Local Action Groups	Share of population covered by Local Action Groups

b. Context related baseline indicators

AXIS		INDICATOR	MEASUREMENT
Horizontal	1	Designation of rural areas	Designation of rural areas with OECD methodology
	2	Importance of rural areas	% territory in rural areas
			% population in rural areas
			% Gross Value Added in rural areas
			% employment in rural areas
AXIS 1 Competitiveness	3	Agricultural land use	% arable area / permanent grass / permanent crops
	4	Farm structure	Number of farms
			Utilized Agricultural Area
			Average area farm size and distribution
			Average economic farm size and distribution
			Labour Force
	5	Forestry structure	Area of forest available for wood supply (FAWS)
			Ownership (% area of FAWS under "eligible" ownership)
			Average size of private holding (FOWL)
	6	Forest productivity	Average net annual volume increment (FAWS)
AXIS 2 Environment	7	Land cover	% area in agricultural / forest / natural / artificial classes
	8	Less Favoured Areas	% UAA in non LFA / LFA mountain / other LFA / LFA with specific handicaps
	9	Areas of extensive agriculture	% UAA for extensive arable crops
			% UAA for extensive grazing
	10	Natura 2000 area	% territory under Natura 2000
			% UAA under Natura 2000
			% forest area under Natura 2000
	11	Biodiversity: Protected forest	% FOWL protected to conserve biodiversity, landscapes and specific natural elements (MCPFE 4.9, classes 1.1, 1.2, 1.3 & 2)
	12	Development of forest area	Average annual increase of forest and other wooded land areas
	13	Forest ecosystem health	% trees / conifers / broadleaved in defoliation classes 2-4

	14	Water quality	% territory designated as Nitrate Vulnerable Zone
	15	Water use	% irrigated UAA
	16	Protective forests concerning primarily soil and water	FOWL area managed primarily for soil & water protection (MCPFE 5.1 class 3.1)
AXIS 3 Wider rural development	17	Population density	Population density
	18	Age structure	% people aged (0-14) y.o. / (15-64) y.o. / >=65 y.o. in total population
	19	Structure of the Economy	% GVA by branch (Primary / Secondary / Tertiary sector)
	20	Structure of Employment	% employment by branch (Primary / Secondary / Tertiary sector)
	21	Long-term unemployment	% long-term unemployment (as a share of active population)
	22	Educational attainment	% adults (25_64) with Medium & High educational attainment
	23	Internet infrastructure	DSL coverage

Source: European Commission (2006). *Common Monitoring and Evaluation Framework.*

Focus on the World Bank Inventory of Rural Indicators

For developing countries it is suggested that core indicators are selected from the following five themes.

- Basic socio-economic data
- *Enabling environment for rural development*
- Broad based economic growth for rural poverty reduction
- *Natural resource management and biodiversity*
- Social well-being (education and health)

These themes, and the proposed indicators under each theme, are partly derived from the set of indicators suggested by World Bank experts, which is shown in Annex A below. The indicators selected are largely determined by the availability of data and the particular policy issue that is to be addressed.

Many of the indicators listed in the Annex at the end of this document are highly correlated. From a resource point of view it makes good sense to identify those correlated indicators and only select one or a few from each group[1]. For the regular monitoring of rural development it is also important that complementary indicators are selected from each theme and that these indicators can be regularly measured.

For a great deal of the indicators listed in the Annex, data are most probably not available on a regular basis. However, as is discussed in Chapter VI, when designing population and housing censuses, agriculture censuses, household budget surveys, labour force surveys and other types of survey, the data needs for constructing a selection of these indicators should be covered by the surveys.

[1]Principal component analysis (PCA) constitutes a **tool for evaluating and presenting the redundancies or associations between several continuous variables** (measured by the correlation coefficient) and is often **used to graphically represent and summarize the key features of a dataset**. Thanks to this descriptive method, datasets with a large number of variables can be analyzed and summarized graphically, revealing the underlying structure of the data. Source: http://training.creascience.com/product_info.php?products_id=45

ANNEX A

WORLD BANK INDICATORS

(i) List of indicators

I - Basic Data

Annual GDP growth (%)
Rural population (millions)
Rural population (% of total)
Population density, rural (people/sq km arable land)
Rural life expectancy (years)
GNI per capita (rural), Atlas method ($)

II - Enabling Environment for Rural Development

Empirical evidence indicates that sound overall macro-economic policy and a supportive institutional framework, good functioning markets and appropriate infrastructural facilities serve as an enabling environment for economic growth and poverty reduction.

II.1 Policies and Institutions

- Agricultural subsidies (% of total)
- Agricultural tariffs (%)
- Fiscal decentralization (% of budget transferred to local governments)
- Food price index (1995 = 100)
- Independence of local courts
- Land Gini coefficient
- Local government elections
- Number of farmers' organizations

II.2 - Markets

- Agricultural raw materials exports (as a % of total merchandise exports)
- Food imports (as % of total merchandise imports)
- Food exports (as % of total merchandise exports)
- Employment in agriculture, female (% of female labour force)
- Agriculture household net disposable income as a percentage of all household disposable net income
- Net disposable income per agriculture household member compared to that of members of all households
- Gross rural domestic savings

- Percentage of rural households with access to formal credit services in financial institutions
- Number of market outlets for agricultural input - produce
- Rural labour force, employed

II.3 - Infrastructure

- Rural roads (% of rural population with access to motorable roads all year round)
- Rural population with access to electricity (%)
- Rural population with access to communications (%): radios, telephone, newspapers and computers

III - Broad Based Economic growth For Rural Poverty Reduction

Agricultural development plays a central role in poverty reduction in low-income countries. Increased agricultural productivity, driven by technological investment, has a powerful dynamic effect, which benefits the poor. However, without complimentary growth in non-farm rural income and employment, rural poverty reduction initiatives will not be sustained.

III.1 - Poverty

- Rural per capita income
- Rural poverty gap ratio
- Proportion of rural population below $1 (PPP) a day
- Rural poverty headcount ratio (percentage of rural population below poverty line)
- Rural per capita dietary energy supply (calories per day)
- Rural infants with low birth weight (% of births)
- Rural child malnutrition (% of children under five who are stunted)

III.2 - Agriculture

- Agricultural gross value added (% of total GDP)
- Agricultural gross value added (average annual growth, 1980-2000)
- Agricultural productivity (gross value added per worker, 1995$)
- Number of farm households (narrow definition)
- Number of farm households (broad definition)
- Food production index (1989-91 = 100) and index per capita
- Irrigated land (% of cropland)
- Cropland/ arable land (%)
- Cereal yield (kilograms per hectare)

- Cereal yield (average annual growth)

III.3 - Non-farm

- Rural gross fixed capital formation (% of GDP)
- Rural labour force, employed in non-farm activities
- Share of rural women employed in the non-agricultural sector (% of total employment in sector)
- Growth of non-agricultural GDP
- Number of rural businesses
- Number of non-agricultural jobs created (annual)

IV - Natural Resource Management and Biodiversity

Sustainable management of natural resources (soil, water, pasture and fisheries) provide the foundation for pro-poor rural development. Agriculture is a heavy consumer of natural resources and innovative approaches have to be found to meet agricultural productivity goods while conserving the natural resource base.

- Forest area (% of total land area)
- Rural protected areas (% of total land area)
- Annual deforestation (% change, 1990-2000)
- Ratio of rural protected area to maintain biological diversity to rural surface area
- Annual freshwater withdrawal (% of total resources)
- Agricultural withdrawal (% of total freshwater withdrawal)
- Emission of organic water pollutants (kg. per day)

V - Social Well-Being (Education and Health)

Improving social wellbeing, and managing and mitigating risks and the vulnerability of rural people is one of the main goals of rural development. To achieve this goal, emphasis should be put on supporting programs that foster human capital (health and education) and social Inclusion.

V.1 - Education

- Rural illiteracy rate (%)
- Rural literacy rate (% ages 15-24)
- Ratio of rural literate females to males (% ages 15-24)
- Net rural enrolment ratio in primary education (% of relevant age group)
- Ratio of rural girls to boys in primary, secondary, and tertiary educational (%)
- Proportion of rural pupils who reach grade 5 (% of grade 1 students)
- Rural primary completion rate (% of relevant age group)

V.2 - Health

- Prevalence of HIV/AIDS (% of rural adults, age 15-49)
- HIV prevalence among pregnant rural women (ages 15 to 24)
- Condom use rate of the contraceptive prevalence rate in rural areas
- Percentage of rural population 15- to 24-years old with comprehensive correct knowledge of HIV/AIDS
- Prevalence of child malnutrition (% of rural children under five)
- Per capita caloric consumption
- Immunization rate, measles (% of rural children under 12 months)
- Rural maternal mortality ratio (per 1,000 live births)
- Rural infant mortality rate (per 1,000 live births)
- Proportion of rural births attended by skilled health staff (% of total)
- Rural population with access to improved sanitation (%)
- Rural population with access to an improved water source (%)
- Rural population with access to health services
- Per capita caloric consumption
- Under-five mortality rate (rural, per 1,000)
- Immunization rate, measles (% of rural children under 12 months)
- Prevalence of child malnutrition (% of rural children under five)

(ii) Definitions of the indicators

I - Basic Data

GDP growth (annual %)

Annual percentage growth rate of GDP at market prices, based on constant local currency. Aggregates are based on constant 1995 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

Rural population (millions)

Rural population is calculated as the difference between the total population and the urban population.

Rural population (% of total)

Rural population is calculated as the difference between the total population and the urban population.

Population density, rural (people per sq km arable land)

Rural population (see definition above) *density* is the rural population divided by the arable land area. Arable land includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded.

Rural life expectancy at birth, total (years)

Rural life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life in rural areas.

GNI per capita, rural (Atlas method, current US$)

GNI per capita, rural (formerly GNP per capita) is the gross national income, converted to U.S. dollars using the World Bank Atlas method (see the Statistical Methods in the 2001 World Development Indicators), divided by the midyear population. GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad. .

II - Enabling Environment

II.1 - Policies and Institutions

Agricultural subsidies (% of total)

Agricultural subsidies as a percentage of total value of agriculture output.

Agricultural tariffs (%)

Tariffs on imports of agriculture raw materials and food, percentage of total import value.
Tariffs on agriculture raw materials and food in major export markets.

Fiscal decentralization

Fiscal decentralization is the share of total fiscal resources under control of sub-national governments or regional political bodies.

Food price index (1995 = 100)

Food price index is a subindex of the consumer price index.

Independence of local courts

Independence of local courts measures the strength of impartiality of the legal system and observance of the law in sub national government. Besides qualitative appreciation, this indicator can also include information about number of appeals and percentage share of appeals won by plaintiffs.

Land Gini coefficient

Land Gini coefficient measures the extent that land distribution in rural areas, among individuals or households, deviates from a perfectly equal distribution.

Local government elections
Local government elections measure the existence of a system of free and fair elections that are held on a regular basis at the sub-national level. Besides qualitative appreciation, this indicator can also included information about number of political parties or independents taking part in the election, frequency of election, participation rates, number of appeals to election results etc.

Number of farmers' organizations
Number of farmers' organizations as a share of the number of active community groups, including civil society's networks existing at regional and national levels. Alternatively, percentage share of farmers belonging to farmers' organizations.

II.2 - Markets

Agricultural raw materials exports (% of merchandise exports)
Agricultural raw materials comprise SITC rev.3, section 2 (crude materials except fuels) excluding divisions 22 (oil seeds and oleaginous fruits), 27 (crude fertilizers and minerals excluding coal, petroleum, and precious stones), and 28 (metalliferous ores and scrap).

Food imports (% of merchandise imports)
Food imports (% of merchandise imports comprising the commodities in SITC rev.3, sections 0 (food and live animals), 1 (beverages and tobacco), and 4 (animal and vegetable oils and fats) and SITC division 22 (oil seeds and oleaginous fruits).

Food exports (% of merchandise exports)
Food exports (% of merchandise exports comprising the commodities in SITC rev. 3, sections 0 (food and live animals), 1 (beverages and tobacco), and 4 (animal and vegetable oils and fats) and SITC division 22 (oil seeds and oleaginous fruits).

Employment in agriculture, female (% of female labour force)
Percentage share of total female labour force engaged in agriculture as employed or through self-employed households. Women as a percentage of all persons engaged in agriculture. Agriculture includes hunting, forestry, and fishing corresponding to major division 1 (ISIC revision 2) or tabulation categories A and B (ISIC revision 3).

Agriculture household net disposable income as a percentage of all household net disposable income
For definition of *agriculture household net disposable income* see Chapter X of the present Handbook. For definition of households, see Chapter IX. Besides comparison with all households, agriculture household net disposal income could be compared with that of other socio-economic groups, e.g. other self-employed households.

Net disposable income per agriculture household member compared to that of members of all households

Household net disposable income is divided by size of household using equivalence scales as suggested in Chapter IX of the present Handbook.

Gross rural domestic savings per capita, percentage of total gross domestic savings per capita

Gross rural domestic savings per capita is the total savings in the rural area divided by the size of the rural population.

Percentage of rural households with access to formal credit services in financial institutions

Number of farmers and percentage of all farmers with credits in financial institutions.

Number of markets outlets for agricultural input-produce

Number of markets outlets for agricultural input-produce is the total number of all physical outlets where buyers and sellers meet regularly to buy or sell agricultural inputs and products.

Rural labour force, employed

Rural labour force, employed refers to agricultural employment. This is the number of workers in agriculture, excluding self-employed persons or persons working in cooperatives as partner.

II.3 - Infrastructure

Rural population with access to roads (%)

Rural population with access to roads (%) is the percentage of rural population with access to roads that can be used by motor vehicles all year round

Rural population with access to electricity (%)

Rural population with access to electricity (%) is the percentage of rural population with access to public electricity in a given year.

Rural population with access to communications (%)

- access to radios is the estimated number of radio receivers in use for broadcasts to the general public in a rural area.
- access to telephone is the access to telephone main lines which are the telephone lines connecting a customer's equipment to the public switched telephone network.
- access to newspapers is the access to daily newspapers.
- access to computers is the access to personal computers or public facility computers for personal use in a rural area.

III - Broad Based Economic Growth for Rural Poverty Reduction

III.1 - Poverty

Rural per capita income

Rural per capita income is the annual GNP per capita based on constant local currency. Aggregates are based on constant 1995 U.S. dollars.

Rural poverty gap ratio (incidence x depth of poverty)

Rural poverty gap ratio is the mean distance separating the rural population from the rural poverty line (with the non-poor being given a distance of zero), expressed as a percentage of the poverty line.

Proportion of population below $1 (PPP) per day

Proportion of rural population below $1 per day is the percentage of the rural population living on less than $1.08 a day at 1993 international prices. The $1 a day poverty line is compared to consumption or income per person and includes consumption from own production and income in kind. Because this poverty line has fixed purchasing power across countries or areas, the $1 a day poverty line is often called an "absolute poverty line".

Rural Poverty headcount ratio (% of rural population below the rural poverty line)

The rural *poverty headcount ratio (% of rural population below the rural poverty line)* is the proportion of the rural population whose incomes are below the official threshold (or thresholds) set by the national government. Rural poverty lines are usually set for households of various compositions to allow for different family sizes. Where there are no official poverty lines, they may be defined as the level of income required to have only sufficient food or food plus other necessities for survival.

Rural per capita dietary energy supply (calories per day)

Rural per capita dietary energy supply (calories per day) refers to the total amount of the commodity available for human consumption during the year.

Rural infants with low birth weight (% of births)

Rural infants with low birth weight (% of births) is the percentage of newborn babies weighing less than 2,500 grams, with the measurement taken within the first hours of life, before significant postnatal weight loss has occurred.

Rural child malnutrition (percentage of children under five who are stunted)

Rural child malnutrition (percentage of children under five who are stunted) is the percentage of children under five whose height for age are more than two standard deviations below the median for the international reference population ages 0 to 59 months. For children up to two years of age, height is measured by recumbent length. For older children, height is measured by stature while standing. The reference population adopted by the WHO in 1983, is based on children from the United States, who are assumed to be well nourished.

III.2 - Agriculture

Agriculture, gross value added (% of total GDP)

Agriculture corresponds to ISIC rev. 3 divisions 1-5 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production. *Gross value added* is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. For definition, see System of National Accounts 1993.

Agriculture, gross value added (average annual % growth, 1980-2000)

Average annual growth rate for agricultural gross value added (for definition, see above) based on constant local currency. Aggregates are based on constant 1995 U.S. dollars.

Agricultural productivity (Agriculture gross value added per worker)

Agricultural productivity is measured as agriculture gross value added per worker or hours worked.

Number of farm households (narrow definition)

Number of farm households (narrow definition) is the number of households whose main source of livelihood is directly derived from farming activities, including crop cultivation and animal husbandry.

Number of farm households (broad definition)

Number of farm households (broad definition) is the number of households whose livelihood is to some extent derived from farming activities, including crop cultivation and animal husbandry.

Food production index (1989-91 = 100) and index per capita

Food production index covers food crops that are considered edible and that contain nutrients. Coffee and tea are excluded because, although edible, they have no nutritive value.

Irrigated Land (% of cropland)

Irrigated land (% of cropland) refers to areas purposely provided with water, including land irrigated by controlled flooding. Cropland refers to arable land and land used for permanent crops.

Cropland/arable land (%)

Permanent *cropland* is land cultivated with crops that occupy the land for long periods and need not be replanted after each harvest, such as cocoa, coffee, and rubber. This category includes land under flowering shrubs, fruit trees, nut trees, and vines, but excludes land under trees grown for wood or timber. *Arable land* (in hectares) includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded.

Cereal yield (kilograms per hectare)
Cereal yield, measured as kilograms per hectare of harvested land, includes wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains. Production data on cereals relate to crops harvested for dry grain only. Cereal crops harvested for hay or harvested green for food, feed, or silage and those used for grazing are excluded.

Cereal yield (average annual growth)
Cereal yield, measured as average annual growth is the rate of change of total cereal harvested in a given year.

III.3 - Non-Farm

Rural gross fixed capital formation (% of GDP)
Gross fixed capital formation in rural and non-rural areas is related to GDP.

Rural labour force, employed in non-farm activities.
Rural labour force, employed in non-farm activities is the share of rural labour force employed in non-agricultural activities.

Share of rural women in wage employment in the non-agricultural sector
Share of women in wage employment in the non-agricultural sector is the share of female workers in the non-agricultural sector expressed as a percentage of total employment in the sector.
The *non-agricultural sector* includes industry and services. Following ISIC rev.3, *industry* includes mining and quarrying (including oil production), manufacturing, construction, electricity, gas, and water. *Services* includes wholesale and retail trade; restaurants and hotels; transport, storage and communications; financing, insurance, real estate and business services; and community, social and personal services.
Employment refers to people above a certain age who worked, or held a job, during a reference period. Employment data include both full-time and part-time workers whose remuneration is determined on the basis of hours worked or number of items produced and is independent of profits or expectation of profits.

Growth in non agricultural GDP
Growth in non-agricultural GDP is the annual growth rate for non-agricultural value-added based on constant local currency.

Number of rural businesses
Number of rural businesses is the total number of all newly created businesses in the rural area in a given year. This includes all legal forms of businesses, from sole proprietorships to corporations.

Number of non-agricultural jobs created (annual)
Number of non-agricultural jobs created (annual) is the annual number of newly created jobs in the non-agricultural sector in rural areas.

IV - Natural Resource Management and Biodiversity

Forest area (% of land total area)

Forest area (% of total land area) is the total surface area of the country covered by forest less the area covered by inland waters, like major rivers and lakes. As defined in the Food and Agricultural Organization's (FAO) *Global Forest Resources Assessment 2000*, forest includes both natural forests and forest plantations. It refers to land with an existing or expected tree canopy of more than 10 percent and an area of more than 0.5 hectare where the trees should be able to reach a minimum height of 5 meters. Forests are identified both by the presence of trees and the absence of other land uses. Land from which forest has been cleared but that will be reforested in the foreseeable future is included. Excluded are stands of trees established primarily for agricultural production, such as fruit tree plantations.

Rural protected areas (% of total land area)

Rural protected areas (% of total land area) are totally or partially protected areas of at least 1,000 hectares that are designated as national parks, natural monuments, nature reserves or wildlife sanctuaries, protected landscapes and seascapes, or scientific reserves with limited public access in rural areas. The data do not include sites protected under local or provincial law. Total land area is used to calculate the percentage of total area protected.

Annual deforestation change (% change, 1990-2000)

Average annual deforestation refers to the permanent conversion of natural forest area to other uses, including shifting cultivation, permanent agriculture, ranching, settlements, and infrastructure development. Deforested areas do not include areas logged but intended for regeneration or areas degraded by fuelwood gathering, acid precipitation, or forest fires. Negative numbers indicate an increase in forest area.

Ratio of rural protected area to maintain biological diversity to rural surface area

Ratio of rural protected area to maintain biological diversity to rural surface area *is defined as nationally protected area as a percentage of total surface area of a country. The generally accepted IUCN–World Conservation Union definition of a protected area is an area of land or sea dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources and managed through legal or other effective means.*

Annual freshwater withdrawals (% of total resources)

Freshwater use refers to total freshwater withdrawals for domestic, industrial, and agricultural use, not counting evaporation losses from storage basins. Total resources refer to total renewable resources, which include internal flows of rivers and groundwater from rainfall in the country, and net river flows from other countries. Withdrawals also include water from desalination plants in countries where they are a significant source. Withdrawals can exceed 100% of total renewable resources where extraction from non-renewable aquifers or desalination plants is considerable or where there is significant water reuse.

Agricultural withdrawals (% of total freshwater withdrawals)

Agricultural withdrawals (% of total freshwater withdrawals) refer to the total freshwater withdrawals for irrigation and livestock production.

Emission of organic water pollutant (kg. per day)

Emissions of organic water pollutants are measured in terms of by biochemical oxygen demand, which refers to the amount of oxygen that bacteria in water will consume in breaking down waste. This is a standard water-treatment test for the presence of organic pollutants.

V - Social Well-Being

V.1 - Education

Rural illiteracy rate

Rural illiteracy rate is the proportion of rural population age 15 and above, who cannot, with understanding, read and write a short, simple statement on their everyday life.

Rural Literacy rate of 15–24 year-olds

Rural Literacy rate of 15–24 year-olds, or the youth literacy rate, is the percentage of the rural population ages 15–24 years old who can both read and write with understanding a short simple statement on everyday life. The definition of literacy sometimes extends to basic arithmetic and other life skills.

Ratio of literate rural females to males 15–24 year olds (% ages 15-24)

The *ratio of literate rural female to males 15–24 years old* (Literacy Gender Parity Index) is the ratio of the rural female literacy rate to the rural male literacy rate for the age group 15–24.

Net rural enrolment ratio in primary education (% of relevant age group)

Net rural primary enrolment ratio is the ratio of the number of rural children of official school age (as defined by the national education system) who are enrolled in primary school to the total rural population of children of official school age. *Primary education* provides children with basic reading, writing, and mathematics skills along with an elementary understanding of such subjects as history, geography, natural science, social science, art, and music

Ratio of rural girls to boys in primary, secondary and tertiary education

Ratio of rural girls to boys in primary, secondary and tertiary education is the ratio of the number of female students enrolled at primary, secondary and tertiary levels in public and private schools to the number of male students in rural areas.

Proportion of rural pupils starting grade 1 who reach grade 5 (% of grade 1 students)

The *proportion of rural pupils starting grade 1 who reach grade 5*, known as the survival rate to grade 5, is the percentage of a cohort of pupils enrolled in grade 1

of the primary level of education in a given school year who are expected to reach grade 5 in rural areas.

Rural Primary completion rate
Rural Primary completion rate is the ratio of the total number of rural students successfully completing (or graduating from) the last year of primary school in a given year to the total number of children of official graduation age in the population.

V.2 - Health

Prevalence of HIV/AIDS (% of rural adults, age 15-49)
Percentage of rural population aged 15-49 whose blood test samples test positive for HIV.

HIV prevalence among 15–24 year old pregnant rural women
HIV prevalence among 15–24 year old pregnant women is the percentage of pregnant rural women ages 15–24 whose blood samples test positive for HIV.

Condom use rate of the contraceptive prevalence rate in rural areas
Condom use rate of the contraceptive prevalence rate in rural areas is the number of women ages 15–49 in marital or consensual unions who are practicing contraception by using condoms as a proportion of all of women of the same age group in consensual unions who are practicing, or whose sexual partners are practicing, any form of contraception.

Percentage of rural population aged 15–24 with comprehensive correct knowledge of HIV/AIDS
Percentage of rural population ages 15–24 with comprehensive correct knowledge of HIV/AIDS is the share of women and men ages 15–24 who correctly identify the two major ways of preventing the sexual transmission of HIV (using condoms and limiting sex to one faithful, uninfected partner), who reject the two most common local misconceptions about HIV transmission and who know that a healthy-looking person can transmit HIV.

Immunization rate, (rural children under 12 months)
The *Immunization rate, (rural children under 12 months)* is the percentage of rural children under 12 months of age who have received at least one dose of measles vaccine.

Rural Maternal mortality ratio (per 1,000 live births)
The *rural maternal mortality ratio* is the number of rural women who die from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, per 1,000 live births. The 10th revision of the International Classification of Diseases makes provision for including late maternal deaths occurring between six weeks and one year after childbirth.

Rural infant mortality rate

The *rural infant mortality rate* is the probability (expressed as a rate per 1,000 live births) of a child born in a specified year dying before reaching the age of one if subject to current age-specific mortality rates in rural areas.

Proportion of rural births attended by skilled health staff (% of total)

The proportion of rural births attended by skilled health staff (% of total) is the percentage of deliveries attended by personnel trained to give the necessary supervision, care and advice to women during pregnancy, labour and the post-partum period; to conduct deliveries on their own; and to care for newborns in rural areas.

Skilled health personnel include only those who are properly trained and who have appropriate equipment and drugs. Traditional birth attendants, even if they have received a short training course, are not to be included.

Rural population with access to improved sanitation (%)

Rural population with access to improved sanitation (%) refers to the percentage of the rural population with access to facilities that hygienically separate human excreta from human, animal and insect contact. Facilities such as sewers or septic tanks, poor-flush latrines and simple pit or ventilated improved pit latrines are assumed to be adequate, provided that they are not public, according to the World Health Organization (WHO) and United Nations Children's Fund's (UNICEF) *Global Water Supply and Sanitation Assessment 2000 Report*. To be effective, facilities must be correctly constructed and properly maintained.

Rural population with access to an improved water source (%)

Rural population with access to an improved water source (%) is the percentage of the rural population who use any of the following types of water supply for drinking: piped water, public tap, borehole or pump, protected well, protected spring or rainwater. Improved water sources do not include vendor-provided waters, bottled water, tanker trucks or unprotected wells and springs.

Rural population with access to health services

Rural population with access to health services is the proportion of the rural population that can expect treatment from common diseases and injuries, including essential drugs on the national list, within one hour's walk or travel

Per capita caloric consumption

Per capita caloric consumption refers to the total amount of the commodity available for human consumption during the year.

Under-five mortality rate (rural, per 1,000)

Under-five mortality rate (rural, per 1,000) is the probability (expressed as a rate per 1,000 live births) of a child born in a specified year dying before reaching the age of five if subject to current age-specific mortality rates in rural areas.

Immunization rate, measles (% of rural children under 12 months)

The *proportion of 1-year-old children immunised against measles* is the percentage of children under one year of age who have received at least one dose of measles vaccine.

Prevalence of child malnutrition (% of rural children under five)

Prevalence of child malnutrition (% of rural children under five) refers to the percentage of rural children who are stunted. This refers to children under five in the rural area whose height for age is less than minus two standard deviations from the median from the international reference population aged 0-59 months. For children up to two years of age, height is measured by recumbent length. For older children, height is measured by stature while standing. The reference population, adopted by WHO in 1983, is based on children from the United States, who are assumed to be well nourished.

Focus on the FAO inventory of rural indicators

The 1979 World Conference on Agrarian Reforms and Rural Development[1] (WCARRD) set of primary indicators is listed below. The indicators marked with an asterisk are the "core" indicators for use in monitoring poverty alleviation.

The WCARRD list of primary indicators

1 - Poverty alleviation with equity

Income/consumption

1. Percentage of population in households with per capita income below the poverty line *
2. Percentage of income accruing to each fractile (decile/quartile) of the population *

Nutrition

3. Percentage of children aged 1-5 years in groups less than: *

   80% weight-for-age

   90% height-for-age

   80% weight-for-height

4. Percentage of under-nourished population *

Health

5. Infant and child mortality rate *
6. Percentage of the population in villages/communities with at least one health auxiliary

Education

7. Adult literacy rate *
8. Primary school enrolment and completion rates

Housing

9. Percentage of rural household with specified housing facilities, e.g. piped water, electricity and sanitation facilities

Access to community services

10. Percentage of population living in villages/communities with access to: potable water, public health services, primary schools *

[1]Held in Rome, 1979. Source FAO.

2 - Access to land, water and other natural resources

Access to community services

11. Percentage of number and area of agricultural holdings by size groups and tenure*
12. Percentage of heads of rural households without land *
13. Average wage rate of agricultural labourers *
14. Rate of unemployment and under-employment
15. Percentage of landless agricultural labourers to the population economically active in agriculture *

3 - Access to inputs, markets and services

16. Percentage of rural households receiving institutional credit

4 - Development of non-farm rural activities

17. Percentage of economically active population engaged in non-agricultural activities in the rural areas

5 - Education, training and extension

18. Number of rural (including agricultural) extension personnel per 1,000 holdings/households

6 - Growth

19. Annual rate of population growth

Recently, a joint team – composed of staff from the Global Donor Platform for Rural Development, the World Bank and FAO – has published the *Sourcebook of indicators for monitoring and evaluation (M&E) agriculture and rural development in less-than-ideal conditions* (GDPRD *et al*. 2008).

This work provides a number of workable approaches for designing a Monitoring and Evaluation (M&E) system that would be of greatest relevance to different agricultural and rural development activities, projects and programmes, and degree of data availability.

A set of priority indicators has been identified in order to allow international comparisons. The core set is composed by the following 19 indicators:

A. Sector-wide indicators for agriculture and rural development

1. Public spending on agriculture as a percentage of GDP from the agriculture sector
2. Public spending on agricultural input subsidies as a percentage of total public spending on agriculture
3. Percentage of underweight children under-5 years of age in rural areas
4. Food production index
5. Annual growth in agricultural value added

6. Rural poor as a proportion of the total poor population

B. Specific indicators for sub-sectors of agriculture and rural development

7. Change in yields of major crops
8. Annual growth in value added in the livestock sector
9. Capture fish production as a percentage of fish stock
10. Proportion of land area covered by forest
11. Percentage of the rural population using financial services of formal banking institutions
12. Public investments in agricultural research as a percentage of GDP for the agricultural sector
13. Irrigated land as a percentage of crop land
14. Change in sales/turnovers of agro-enterprises

C. Indicators for thematic areas related to agriculture and rural development

15. Percentage of farmers who are members of community/producer organizations
16. Withdrawal of water for agricultural as a percentage of total fresh water withdrawal
17. Proportion of land area formally established as protected area
18. Change in soil loss from watersheds
19. Percentage of land area for which there is a legally recognized form of land tenure

FOCUS PIECES

GDPRD, FAO & World Bank (2008). *Tracking results in agriculture and rural development in less-than-ideal condition. A sourcebook of indicators for monitoring and evaluation*. FAO, Rome.

CHAPTER VII

DATA SOURCES

VII.1 INTRODUCTION

Rural development statistics are concerned with the measurement of a multitude of heterogeneous variables in the areas of demography, geography and territorial descriptions, environment and, above all, the whole spectrum of economic and social well-being, taken from a multitude of different sources. In fact, rural development statistics draw from almost all statistical fields. Yet, few of the agencies responsible for these statistics have rural areas in mind when designing their statistical systems. This creates two major problems: first, **the various data sources are often not designed in such a way that they can accommodate the various requirements of rural development statistics**, in particular sufficient geographical background. Labour and educational statistics, for instance, might very well be timely and have detailed breakdown by types of employment and education but only on a national level or, in the best case, major regions. They may not be available at smaller administrative levels such as communes, which are the basic units in rural development statistics.

To be useful for rural development statistics, surveys and other sources of primary data must contain the rural-urban code that is most appropriate for analyzing rural development or contain codes with sufficient geographic specificity so that an analyst can create such a code. This is generally less of a problem where the statistics for rural development are analyzed by the statistical agencies that carry out the survey, as confidentiality is not an issue. However, where rural analysts use publicly released versions of data and geographic specificity is limited, survey data may be made largely useless for rural analysis if the relevant geographic codes are not part of the data set. Thus, if the survey defines "rural" as outside of urban localities of 2,000 or more inhabitants, this cannot be used where the analyst is concerned with rural regions which are outside the immediate influence of major urban centres.

Whatever definition of rural is used, the actual territory classified as rural inevitably changes over time as the most rapidly growing rural areas cross the size and/or density threshold to become urban. Ideally, during transition years, surveys carry both new and

old delineations of rural and urban. At the very least, in reporting a statistical series, years when the delineation was changed need to be noted.

National level surveys are constructed to represent the nation as a whole. Typically, sampling units are grouped or stratified on the basis of political and/or geographic characteristics and selected at random from within groups. The sampling frame is updated to take account of new units and those known to have disappeared and a sample is then identified for interviewing. Survey sampling and interviewing costs are lower to the extent that the sampling is clustered, with fewer sampling units used for a given total expected sample size. However, especially where effectiveness of the stratification in capturing geographic variation is weak, reducing the number of sampling units lowers the representativeness of the survey respondents. Sampling design may result in samples that do not well represent the populations of rural regions or areas, particularly if sampling units are not stratified along rural-urban lines. Moreover, surveys selecting different sampling units over time can yield results that vary over time even when no actual change is present.

The second (and related) main problem is that rural development statistics often have to **mix data from different sources**, sources that may differ in definitions, coverage, precision, measurement period and periodicity. For example, statistics on employment may differ depending on the source (household surveys, establishment [business] surveys, or administrative records). The problem is compounded when data from two or more sources are combined to form an indicator. Even combining national accounts data with employment and foreign trade data is problematic despite the close complementary nature of these statistics. When constructing rural development indicators where the nominator and the denominator are based on different data sources, much attention must be paid to explaining the consequences of this on the results of the indicator.

A good example of mixing data sources is provided by the International Labour Office's (ILO's) new agricultural labour productivity indicator (Key Indicator of Labour Market [KILM] 18e) which is largely derived from the Groningen Growth and Development Centre (GGDC) Database at the University of Groningen (the Netherlands) (See Box VII.1).

When comparing rural indicators between countries other problems are added. Countries tend to use different definitions of rurality and degree of rurality as well as of key concepts such as the household. Even among quite similar countries, for instance in the European Union, there is a wide span in the definition of household: people living under the same dwelling whether or not there are family ties, sharing of expenditures, pooling of income, the existence of family or emotional ties or a combination of one or several of these characteristics. There may also be big differences in the child-adult definition and how much weight is given to non-adults in the household aggregate. (See Chapter IX of this Handbook for a further discussion of these issues.) And when it comes to the variables used to characterise the household, there may be a great span in the definitions employed by countries.

Consequently care should be taken when comparing indicator levels between countries. It is preferable to focus on comparing **changes in indicator levels**, in particular if there

is relative national stability in the calculation of indicators over time. While, for instance, price statisticians might be confident in presenting estimates of price changes for country comparisons, they are not that keen on comparing absolute levels because like is not always being compared to like.

BOX VII.1
An example of mixing data sources ILO's new agricultural labour productivity indicator (Key Indicator of Labour Market - KILM)

For the OECD economies, most of which are included in the KILM 18 tables under the headings of "major Europe" and "major non-Europe", GDP and labour compensation are mainly obtained from the OECD: National Accounts, Volumes I and II (annual issues). Employment estimates for the aggregate economy are mostly taken from OECD: Labour Force Statistics (annual issues), and for the individual sectors – as far as available – from the OECD: National Accounts, Volume II (annual issues) and the OECD: Structural Analysis (STAN) database. The estimates available from the OECD, which originally were obtained from national statistical offices and, where possible, harmonized for differences in concepts and industry classifications, have been supplemented, where necessary, with national accounts statistics obtained directly from the individual economies. For some economies, the database of the United States Bureau of Labor Statistics (BLS) was used, in particular for estimates on employment and for manufacturing.

For non-OECD economies, the national accounts and labour statistics publications of individual economies were often taken as the point of departure. The statistics from these sources were used to supplement statistics from international organizations such as the World Bank, the Asian Development Bank, the ILO and the United Nations Statistical Office. In the estimations for agriculture, forestry and fisheries, international sources served as the point of departure. Intensive use was also made of the FAO Database from the Food and Agriculture Organization of the United Nations (FAO). However, where it was possible to disaggregate the group to provide estimates for agriculture and forestry (without fisheries) and for agriculture (without forestry and fisheries), data came mostly from national sources. In addition, benchmark estimates of annual hours worked for a significant number of non-OECD economies have been developed.

The estimates for agriculture, forestry and fisheries (AFF), which are of an experimental nature and include as many as 112 economies, are based on measures of purchasing power parity (PPP) taken from a FAO database of prices received by farmers for about 180 products in 1995. These prices refer to farm-gate prices or first-point-of-sale prices, and in principle do not include transport costs or the profit margins that generally accrue to intermediaries. The PPPs for the farm sector are assumed to be representative of the fisheries and forestry industries. As for the aggregate economy, the PPPs for AFF are multilateral, using a Geary-Khamis weighting system. In contrast to the estimates for the aggregate economy and for the other sectors, the estimates for AFF are not backdated to provide them at a 1990 price level (KILM, 2004; van Ark and Monnikhof, 2000).

The rest of this chapter reviews the main data sources used, singly or in combination, to generate statistics for rural development. The discussion attempts to cover both OECD members and developing countries.

VII.2 POPULATION AND HOUSING CENSUSES

Censuses covering the total population and housing stock are indispensable for providing statistics on the population, family, household and housing situation on a uniform basis for small areas and sub-groups. The characteristics of the population include geographic, demographic, economic, educational and household and family characteristics. For many countries, a traditional census is vital for providing such information and often there are no viable alternatives. Registers and other administrative sources are an alternative to the traditional census as far as they contain the relevant topics, definitions and classifications and cover the entire population. Sample surveys used alone cannot provide equivalent data for small areas, but they can be used in combination with a census or to supplement census information on specific topics.

For rural development statistics, censuses are an invaluable source of data because of their complete coverage of the population, at least for basic demographic statistics, which permits a breakdown to small geographical units. The main disadvantage is the long time periods between the individual censuses, normally five years. Another disadvantage is that they are usually not sufficiently detailed with respect to expenditures, consumption and income patterns. As will be seen, however, this can be attenuated by conducting household budget surveys linked as sub-samples to censuses.

There are several international sets of recommendations which provide guidance and assistance to countries in planning the content of their census. These recommendations also facilitate and improve international comparability through the harmonisation of data, definitions and classification of topics. To this end readers may wish to consult the following:

1. **Recommendations for the 2000 Censuses of Population and Housing in the ECE Region**. Jointly prepared by the United Nations Economic Commission for Europe and the Statistical Office of the European Communities, United Nations, New York and Geneva, 1998. Statistical Standards and Studies – No.49.

   These recommendations for European countries cover inter alia:

   - Units of enumeration
   - Geographic characteristics of persons
   - Demographic characteristics of persons
   - Economic characteristics of persons
   - Educational characteristics of persons
   - Household and family characteristics of persons

- Characteristics of housing units and other living quarters
- Characteristics of buildings containing dwellings

Focus on Recommendations for the 2000 Censuses of Population and Housing in the ECE Region

Over the years, the United Nations Statistics Division has played a pivotal role in the coordination of the World Programme by issuing and revising international recommendation, providing technical assistance to countries in census operations, and compiling and disseminating census results from countries or areas. The last global census recommendations were published in 1998 under the title *Principles and Recommendations for Population and Housing Censuses, Revision 1*.

For the 2010 World Programme on Population and Housing Censuses, the Statistical Commission, at its thirty-sixth session, requested that the United Nations Statistics Division, through the United Nations Expert Group on the 2010 World Programme on Population and Housing Censuses, proceed with its work on the revision and update of *Principles and Recommendations for Population and Housing Censuses*.

The Recommendations for Population and Housing Censuses include inter alia:

- Definitions, essential features and uses
- Planning, organisation and administration
- Use of sampling
- Units place and time of enumeration
- Topics to be investigated
- Census products and services
- Census data utilization

Focus on Principles and Recommendations for Population and Housing Censuses

VII.3 AGRICULTURAL CENSUSES AND SURVEYS

While in OECD countries agriculture typically accounts for only a small and declining minority of employment, even in rural areas, in many developing countries most of the rural population still depend directly or indirectly on agriculture for their livelihood. Particularly in the latter group, censuses and surveys of this sector are major sources of data on the agricultural production units, which are mainly household based. Similar to population and housing censuses, agricultural censuses are comprehensive investigations providing structural information on the agriculture sector for small geographical units. They have the same limitations as the population censuses, mainly the length of time separating two censuses (10 years as recommended by the FAO) and the lack of coverage of expenditures, consumption and income patterns. During the interval separating two censuses, more frequent agricultural surveys (using the census data as the benchmark and sampling frame) are usually conducted to up-date census results.

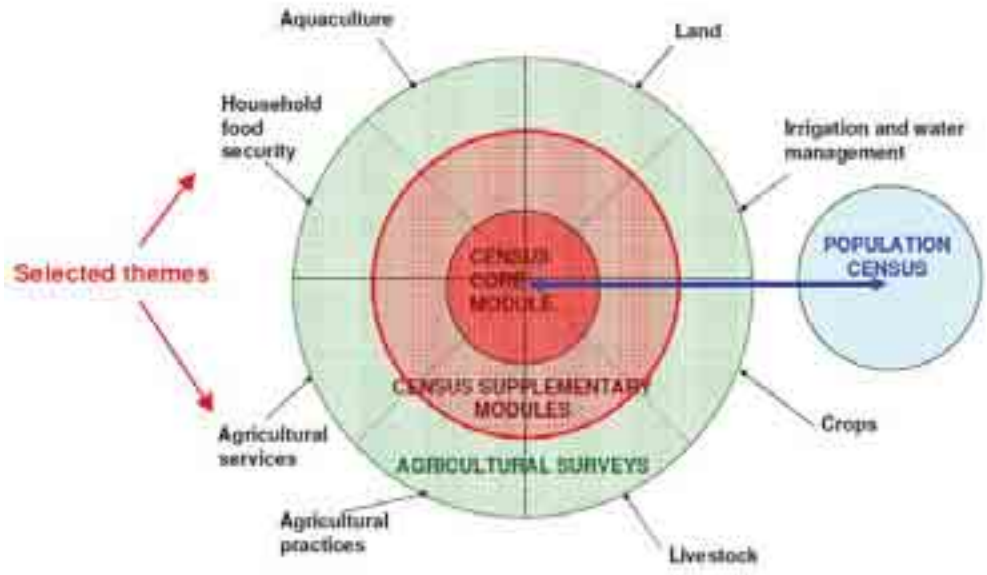
Despite the limitations indicated above, censuses of agriculture remain a major source of data on rural populations in many countries. The FAO, in consultation with other international organisations prepares the "*World Programme for agricultural census*" every 10 years. This provides up-dated guidelines on methods, concepts and definitions for the organisation of agricultural censuses that are held in countries at all stages of economic development.

The "*World Programme for the Census of Agriculture 2010*" (FAO, 2005) prepared by the FAO, adopts a modular approach which aims at helping countries to meet the need for a wider range of data from the agricultural censuses, while minimizing the cost of census-taking. It recommends that the agricultural census should be an element of a broader framework of integrated agricultural census and survey system. It comprises:

- A **core census module**, to be conducted on a complete enumeration basis, will provide a limited range of key structural items of importance for national policy-making, making international comparisons, constructing sampling frames, and analysing data at detailed geographic or other levels. The core module is similar to conventional agricultural censuses in the past, but with a much more restricted range of items.
- One or more **census supplementary modules**, to be conducted on a sample basis at the same time as, or immediately after, the core census module, to provide more detailed structural data or data not required at lower administrative levels. The sample for the census supplementary modules will be selected based on sampling frames from the core census module.

A schematic representation of the agricultural census within the framework of the system of integrated agricultural censuses and surveys is shown in Figure VII.1. It shows items under selected headings or themes such as "land" and "irrigation and water management", according to their suitability for inclusion in the agricultural census core module, in the agricultural census supplementary modules, or in the programme of agricultural surveys.

FIGURE VII.1
The agricultural census in the framework of the system of integrated agricultural censuses and surveys



Source: FAO (2005)

Box VII.2 contains the items recommended for core and supplementary modules

Theme 12 provides for reducing the statistical invisibility of individual female farmers' contributions to and involvement in agricultural production. Such information is of particular relevance for developing countries where the majority of female farmers operate within holdings headed by a male holder, usually their husband or other male family members. In the past many agricultural censuses have aggregated all agricultural work and production to the head of the holding, thereby rendering the work of the individual active holding members statistically invisible. *Theme 12* supplies guidelines on how to overcome this lack of information through the use of the sub-holding and sub-holder concepts. Given the importance of female farmers' involvement in agricultural production and the increasing recognition for the need of gender specific evidence-based planning of agricultural growth in developing countries, it is important that more data become available on their involvement in agriculture. Selected countries in Africa have successfully tested and used the sub-holding and sub-holder concepts which begins to help overcome this shortcoming of "classic" agricultural census programmes. (FAO, 2010-2). For further information, please refer to: *"Agri-gender database, a statistical toolkit for the production of sex-disaggregated agricultural data"* (http://www.fao.org/gender/agrigender/en).

Another important feature of the new approach for generating data on rural populations and areas is the provision made for the collection of infrastructure data at the community level in addition to holding-level data. Emphasis is also given to integrating the agricultural and population censuses, not only through the use of standard concepts and definitions and sharing field materials, but also coordinating the two data collection activities, adding agriculture-related questions to the population census, and the linking

of data from the two sources. Also, recommendations are made for countries that wish to broaden the census to all rural households.

The new approach will make agricultural censuses a much more relevant source of data on rural areas and populations. Since many farm households depend in part on off-farm income or income from family members living elsewhere, this approach will also aid in the assessment of the well-being of farm households (see Part II of this Handbook, Chapters from VIII to XV).

For further information, please refer to:
http://www.fao.org/economic/ess/world-census-of-agriculture/en

BOX VII.2
FAO: World Census of Agriculture

Items recommended for the core module

0001 Identification and location of agricultural holding
0002 Sector of agricultural holding
0003 Sex of agricultural holder
0004 Age of agricultural holder
0005 Household size
0006 Main purpose of production of the holding
0007 Area of holding according to land use types
0008 Total area of holding
0009 Land tenure types on the holding
0010 Whether holding is irrigated
0011 Presence of temporary crops on the holding by crop type
0012 Presence of permanent crops on the holding by crop type and whether in a compact plantation.
0013 Number of animals on the holding by livestock type
0014 Presence of aquaculture on the holding
0015 Presence of forest and other wooded land on the holding
0016 Other economic production activities of the holding's enterprise

Items for consideration for the supplementary modules

Theme 01
Land (Reference group: holdings with land in Item 0008)
Theme 02
Irrigation and water management (Reference groups: Items 0201-0205 – holdings with irrigation in Item 0010; Item 0206 – holdings with temporary crops or permanent crops in Items 0011 and 0012; Item 0207 – holdings with land in Item 0008)
Theme 03
Crops (Reference groups: Items 0301-0303 – holdings with temporary crops in Item 0011; Items 0311-0314 – holdings with permanent crops in Item 0012; Items 0321-0327 – holdings with temporary crops or permanent crops in Items 0011 and 0012)
Theme 04
Livestock (Reference group: holdings with livestock in Item 0013)
Theme 05
Agricultural practices (Reference group: all holdings)
Theme 06
Agricultural services (Reference group: holdings in sector "single-holding household" in Item 0002)
Theme 07
Demographic and social characteristics (Reference group: holdings in sector "single-holding household" in Item 0002)
Theme 08
Farm labour (Reference group: Items 0801-0814 – holdings in sector "single-holding household" in Item 0002; Items 0821-0823 – all holdings)
Theme 09
Household food security (Reference group: holdings in sector "single-holding household" in Item 0002)
Theme 10
Aquaculture (Reference group: holdings with aquaculture in Item 0014)
Theme 11
Forestry (Reference group: holdings with forest and other wooded land in Item 0015)
Theme 12
Management of the holding (Reference group: holdings in sector "single-holding household" in Item 0002)
Source: FAO (2005)

VII.4 HOUSEHOLD BUDGET SURVEYS (HBSS)

The main sources for this section are: "*Household Budget Survey in the EU. Methodology and recommendations for harmonisation – 2003*" (European Commission, Luxembourg, 2003) and "*Household Surveys in Developing Countries and Transition Countries, Implementation and Analysis*" (United Nations, New York). The use of such surveys in the provision of data for statistics on the incomes (and wealth) of agricultural households is dealt with in Chapter XIII of this Handbook.

There are two main objectives for a household budget survey (HBS). The first is to obtain weights, which are used for elementary aggregates in the construction of consumer price indices or in cost of living indices. The international recommended classification of the items of goods and services in HBSs is the United Nations Classification of Individual Consumption According to Purpose (COICOP) (UN, 2003). The HBS is also used as an input to the building of the national accounts for measuring the household final consumption at an aggregate level.

The second major objective of HBSs, which is the main interest in the present Handbook, is to provide detailed information on the **living conditions of private households** in defined areas and time. The surveys are meant to give a precise picture of private households' total consumption and expenditures broken down in various details as a function of household characteristics such as income, socioeconomic characteristics, size and composition, degree of urbanization, region, patterns of consumption between different types of household as well as information on levels of income, wealth and expenditures. Specific sub-populations such as the elderly, the young, rural populations etc. might be studied. In many countries the distribution of income and consumption is studied from the poverty perspective. Another usage in some countries is for the studying of nutritional patterns of households.

It is very common that special surveys are attached to the regular HBS, e.g. the use of ICT or Internet to take one example.

HBSs are very multi-purpose in nature and cater to a large number of users and uses. For rural development statistics, they are an invaluable source of data although in some countries they do not permit sufficient breakdown by regions and socio-professional categories (for example, farmers – see Chapter XIII of this Handbook). However, it is clear that HBSs have great potential for the improvement of rural development statistics. It is here that demands for special rural statistics and the required breakdown must be formulated. If this is done it is, however, in competition with many other statistical areas of interest, and there is a limit to how large the HBSs can be made. This implies that the demands from rural statisticians must be well-formulated, consistent over time, be of interest to many users and be cost effective.

The frequency of HBSs varies greatly between countries, from annual surveys to surveys every five years or even every 10 years. In many countries the survey period is 12 months, that is, the survey is carried out continuously over the whole year.

As the basic unit for data collection is the household; even if dwellings or addresses happen to be the sampling units, the way households are defined is important. Normally

the definition of a household is based on persons sharing an accommodation or address and/or sharing expenditures and/or income to various degrees. The family bond is another possible criterion. Even within homogenous groups of countries (for example, the European Union), different definitions might be applied. Whatever definition is reached, it has to be made clear which categories of persons are included and which are excluded. The reference person of the household should also be defined as well as the child-adult setting.

The main characteristics of HBSs are briefly summarized in bullet form below:

- They are normally confined to the population living in **private households**.
- The **sample size** varies from a few thousands households to 50,000 in large European countries and to more than 100,000 people in the largest countries.
- **Probability sampling** is the recommended method, which is also used in most European countries.
- The most common practise is to use a **two-stage design** for sampling. First, a stratified sample of area units is selected by using probabilities proportional to size after stratification by geographical areas or by other variables. The second stage consists of the selection of households within each sample area. In countries with full-cover registers, a single stage sampling is used.
- There are a number of different approaches to **sampling frames**.
    - One approach is to **base the HBS as a sub-sample on another survey**, such as a labour force survey, or drawn from a master sample. This means that the HBSs can be linked to other surveys and that a wider range of data can be imputed and estimated. There is also an economic advantage of using such a sub-sample. There are, however, two major drawbacks. First, the **response burden** increases for the selected households. Second (and related to the first drawback) is the **effect on the response rates**. It is generally necessary to restrict the HBS to those households that successfully completed previous surveys.
    - Second, for those countries that have sufficiently well-covered **registers**, an alternative approach is to use these as the sampling frame.
    - A third approach is to use **area frames** such as a sample of areas from the population census or from a master sample, often constructed from the population census. By sharing between different surveys, the cost of developing and maintaining sampling frames might be reduced. There is also the advantage of operational linkages between different su**rveys.**
- Normally, the **stratification criteria** are region, socio-professional categories of the reference person and household type or size.
- One of the major problems with HBSs is a high **non-response rate**, which might have serious implications on the reliability of the results. With a high rate of non-response it is common to undertake **substitution**.
- The recording of household data is usually done by a combination of **interviews** (in the EU usually two per household), **questionnaires** and **diaries**, in which households record all items of daily consumption and expenditures.

- The objectives of HBSs are to determine the level and structure of private households' expenditures or consumption or both. **Final consumption expenditure of households** is defined as:

  Monetary expenditures intended for consumption + Consumption of own production + benefits in kind + imputed rents for owner occupied housing

  Another, and possibly better concept, is the **actual final consumption expenditure of the household** which also includes acquisitions from governments and non-profit institutions servicing households (NPISH).

- For the measurement of various types of income (disposable income, net income etc.) and their components, see part II of this Handbook.

The list of variables in a HBS usually contains the following items:

1. Demographic and geographical characteristics;
2. Characteristics of the household, household members and the reference person;
3. Education;
4. Insurance;
5. Indebtedness;
6. Economic activity;
7. Housing;
8. Possession of consumer durables;
9. Income;
10. Individual consumption by purpose.

HBSs are, as has been shown above, essential for many important statistical areas: national accounts, CPI, poverty statistics and rural statistics, just to mention a few. They are also, however, rather costly which puts the focus on cost-effectiveness. To this end there are two approaches to the design of the surveys: larger surveys every five years with say 5,000 households or surveys conducted on a continuous basis with say 1,000 households per year. In the latter model, data are accumulated over several years. For instance, data from three subsequent years might be aggregated and converted into annual results after having been adjusted for price changes. The advantage is that the workload is more evenly distributed and a smaller number of staff can be permanently engaged, which will increase their competence level.

VII.4.1 LIVING STANDARDS MEASUREMENT STUDY SURVEYS – AN INTRODUCTION

The overall objective of living standard measurement study (LSMS) surveys is the measurement and study of the determinants of living standards in **developing countries**, especially the living standards of the poor. To accomplish this objective, LSMS surveys must collect data on many aspects of living standards, on the choices that households make, and on the economic and social environment in which household members live. Much of the analysis undertaken using LSMS surveys attempts to investigate the determinants of living standards and this requires more sophisticated analytical methods than simple descriptive tables.

LSMS surveys have several characteristics that distinguish them from other surveys. One of the most important is that they use several questionnaires to collect information about many different aspects of household welfare and behaviour. These consist of a household questionnaire, a community questionnaire, a price questionnaire, and, in some cases, a facility questionnaire.

Another characteristic of LSMS surveys is that they typically are nationally representative, but use relatively small samples – usually between 2,000 and 5,000 households. This will yield fairly accurate descriptive statistics for the country as a whole and for large sub-areas (such as rural and urban areas or a few agroclimatic zones), but usually not for political jurisdictions (such as states or provinces). The surveys' sample sizes are generally adequate for the regression methods often used for policy analysis of LSMS survey data.

Because of their complexity, LSMS surveys have rigorous quality control procedures to ensure that the data they gather are of high quality. These procedures minimize any errors caused by respondent fatigue or the use of proxy respondents. The interviewer makes multiple visits to households to find any members who were not home during the interviewer's earlier visits. This also reduces the need to use proxy respondents.

There is one supervisor for every two or three interviewers. The supervisors must revisit a significant percentage (often 25%) of the sampled households to check on the accuracy of the interviewer's data. They must directly observe some interviews, and they must review each questionnaire in detail. The supervisor's assessment of these procedures is documented. Data entry and editing are done as soon as each interview is over. A data entry programme carries out a large number of quality checks to detect responses that are out of range or inconsistent with the other data from the questionnaire. Any problem this programme detects can be verified or corrected in a subsequent visit to the household by the interviewer (Grosh and Glewwe, 2000).

Components of a typical LSMS survey

One distinguishing characteristic of LSMS surveys is that they are multi-topic and multi-level: they use several questionnaires to study many different aspects of household welfare and behaviour. The largest LSMS questionnaire is the household questionnaire. The LSMS household questionnaire always collects detailed information to measure household consumption, which is the best monetary indicator of household welfare. The household questionnaire also collects information on income and transfer income, while data on income from wage employment are collected in almost every LSMS survey. Further, many LSMS surveys also collect data on income from agriculture, household enterprises, and miscellaneous sources.

LSMS household questionnaires also record information on a variety of other dimensions of welfare and the use of social services (for example, housing and related amenities and the level of education of adults). A typical household questionnaire collects more information than this, in order to expand the range of living standards indicators that can be studied and allow researchers to model the choices households make. Some of the information (for example, consumption, housing quality and

agricultural production) is collected only at the household level, but much of it (for example, employment, education and health) is collected at the individual level (Grosh and Glewwe, 2000:12).

Though LSMS is seen as relating to developing countries, it is worth noting that something similar is found in the European Union, in the form of the Statistics on Income and Living Conditions (EU-SILC), an instrument aimed at collecting timely and comparable cross-sectional and longitudinal multidimensional microdata on income, poverty, social exclusion and living conditions. This instrument is anchored in the European Statistical System (ESS). The EU-SILC project was launched in 2003 on the basis of a "gentleman's agreement" in six Member States (Belgium, Denmark, Greece, Ireland, Luxembourg and Austria), as well as in Norway. The starting date for EU-SILC under a legal framework was 2004 for the EU-15 (with the exception of Germany, the Netherlands and the United Kingdom, which had derogations until 2005), as well as for Estonia, Norway and Iceland. The 10 new EU Member States with the exception of Estonia started in 2005. The instrument has also been implemented in Bulgaria, Romania, Turkey and in Switzerland as from 2007. Implementation in Croatia is being discussed. Data are collected mostly by surveys of individuals within households, except in countries where these are already available in administrative registers.

EU-SILC aims to provide two types of data:

- Cross-sectional data pertaining to a given time or a certain time period with variables on income, poverty, social exclusion and other living conditions
- Longitudinal data pertaining to individual-level changes over time, observed periodically over, typically, a four year period.

Social exclusion and housing condition information is collected at household level while labour, education and health information is obtained for persons aged 16 and over. The core of the instrument, income at very detailed component level, is mainly collected at personal level but a few components are included in the household part of SILC.

The EU-SILC has been established to provide data to be used for the structural indicators of social cohesion (such as the "at-risk-of poverty" rate, and gender pay gap). While the generally low numbers of household headed by farmers is a barrier to the use of EU-SILC in establishing the income (and consumption) patterns of agricultural households relative to national averages (see Chapter XIII of this Handbook), EU-SILC holds potential for providing statistics on households living in rural areas (defined in various ways), though this potential seems not yet to have been explored.

For further information see the following link:
http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu_silc

VII.4.2 INTERNATIONAL HOUSEHOLD SURVEY NETWORK

The demand for household-based economic and social data by national as well as international agencies is constantly growing. In developing countries, HBSs are the most effective way of obtaining most of the information relating to well-being and poverty. However, surveys are complex and expensive undertaking, requiring skilled staff to design and manage them. In many poor countries surveys can only be undertaken with

significant outside assistance, as in the case of the LSMS surveys. This means that the surveys are donor driven and often of an *ad hoc* nature, with surveys only conducted when donor funding is available. The most serious problem is that the activities among different donors are often not coordinated. There are many examples of duplicated or conflicting data collection activities, which result in a waste of funds and put a high burden on the scarce personnel resources in the statistical offices in the receiving countries. To this should also be added the need to improve the quality of household survey data.

In this context, an initiative of The World Bank is to establish an **International Household Survey Network.** This is designed to ensure better coordination between international and national donor agencies, on the one hand, and the receiving agencies, on the other. The aim is to facilitate the collection of more and better data, make better use of available data, increase the frequency of data collection, strengthen national capacities in receiving countries and reduce costs. This comes at the price of less freedom of survey design by a particular donor and the loss of the associated prestige. It should be acknowledged that this is a reasonable restraint on the donor.
In some situations, however, it may be possible to use the MS for surveys concerned with the study of characteristics of economic units, such as household enterprises, own account businesses and small scale agricultural holdings.

VII.5 LABOUR FORCE SURVEYS

Labour force surveys are another important source for rural development statistics. These surveys focus not only on employment and unemployment characteristics but also on details of hours worked, type of work, economic activity, education and training, and income as well as a whole range of demographic variables. Labour force surveys may also contain various types of *ad hoc* modules related to specific urgent topics, such as computer use at home and at work. The units of measurement are both individuals and households. With households, it is important to record variables that describe their composition since the definition of household varies between countries.

Labour force surveys are the source that gives the most detailed information on labour market issues at an aggregate level as well as across economic sectors. However, for cost reasons, the sample size is normally not sufficient to provide reliable figures on regional disaggregation or for small industrial or commercial sectors. This is a serious drawback when using labour force surveys for rural development statistics. The problem may be partly overcome by linking the surveys to censuses and imputing territorial breakdown.

As previously mentioned, the definition of household differs between countries, which has implications for international comparisons. In order not to make things even worse, countries are recommended to use the available set of the most recent revisions of international standards such as:

- International Standard Industrial Classification of all Economic Activities (ISIC), United Nations;
- International Standard Classification of Occupations (ISCO), ILO;
- International Standard Classification of Education (ISCED), UNESCO.

In several countries, a significant proportion of the population work on their own small farm and **produce only for their own consumption**. Is such a person considered to be employed? Normally the definition of employment states that a person is employed if he/she did any work for pay or profit during the reference week for the survey. Work in this context means work for pay, payment in kind or profit during the reference week, even for as little as one hour. If production for one's own consumption falls within the production boundaries in national accounts (e.g. it is considered important in relation to the total supply of these goods), it should be considered as employment.

The **treatment of seasonal workers** is another aspect of employment that is important in all countries, but particularly for developing countries and for rural statistics. It is clear that during the off-season the seasonal workers should not be considered as being employed in the reference period as they do not continue to receive wages or salaries, even though they might have a contract or an assurance to return to work at a later stage. To capture seasonal fluctuations in employment, labour force surveys are often carried out quarterly or even monthly.

Labour force surveys are often the only source of information on underemployment, where people work part-time but would work more hours given the opportunity to do so. These surveys may also identify people who are not in the labour force, but would work if the opportunity arose.

Finally, labour force surveys are often the only surveys that ask about people with second jobs (such as farmers who also hold off-farm jobs), employment and unemployment over the past year, or other information that helps to better understand employment conditions, particularly in rural areas.

VII.6 DEVELOPING AN INTEGRATED SURVEY PROGRAM

VII.6.1 SUGGESTED INTEGRATED PROGRAMME OF HOUSEHOLD SURVEYS

The value of household surveys covering family status, access to services, economic activity, production practices, expenditure and social activity would be greatly enhanced if they were followed up by the routine use of panel surveys using sub-samples, in order to track performance. This approach would ensure comprehensiveness and consistency and avoid the use of excessive amounts of *ad hoc*, largely anecdotal data. It requires a long-term financial commitment by countries and international development partners. Some initiatives are under way which could help in this effort.

One approach (Vogel, 2004b) could be an important first step. Vogel proposes a framework and overall design of an integrated annual rural household survey programme, which would integrate a country's core statistical needs with those needed to monitor progress towards meeting the Millennium Development Goals (MDGs). The framework recognizes some of the MDG indicators and incorporates them as part of the core items and issues covered in the survey design. The survey design recognises that there are core data items at the household level that need to be monitored every year but it also recognises that there is no need to monitor other items every year because

situations do not change that rapidly. There are two reasons for proposing an annual survey framework. One is to build a database of household data that can be used for analytical purposes for current and future policy and investment decisions, and especially to forecast the consequences of any proposed actions. A primary goal is to provide a survey framework that provides the data required to monitor progress towards meeting the MDGs, and more importantly, the inter relationships between them. Another goal is to foster statistical capacity building. When countries only do periodic household surveys, they receive training and technical assistance for that particular instance. However, when the survey is completed the sponsor or donor goes elsewhere, leaving the country without the capacity to continue.

Figure VII.3 below provides a brief description of the proposed survey framework. It should be noted that the proposal suggests having a national level rural household survey to provide a cross section of information over time. Further, the sample is divided into replicates with five being used each year. By the fifth year, each replicate will have been in the sample for five consecutive years.

FIGURE VII.3
Description of distribution of sample replicates by year and detailed questionnaire to be used

Replicate Year	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10	Rep 11	Rep 12
1	A	A	A	A	A							
2		B	B	B	B	B						
3			C	C	C	C	C					
4				D	D	D	D	D				
5					A	A	A	A	A			
6						B	B	B	B	B		
7							C	C	C	C	C	
8								D	D	D	D	D
9									A	A	A	A
10										B	B	B
11											C	C
12												D

Detailed Questionnaires

A. MDG 1. Poverty, Hunger, Employment, Income

B. MDG 2 and 3 Education

C. MDG 4, 5, and 6 Health

D. MDG 7 Environment

Every replicate receives same core questionnaire every year

Source: Derived from World Bank et al. (2011)

A. (MDG 1) Indicators of progress toward eradicating poverty and hunger. This would also have information about employment and wage rates included in the October Inquiry. This would provide the primary data needed to enable the calculation of Purchasing Power Parities for the poor in conjunction with the International Comparison Program.

B. (MDGs 2 and 3) Indicators of progress toward achieving universal primary education and gender equality for women.

C. (MDGs 4, 5, and 6) Indicators of progress made to reduce child mortality, improve maternal health and combat diseases

D. (MDGs 7 and 8) Indicators at the household level to measure the consequences of improving the environment and improving the competitiveness of markets by removing distortions to trade.

Every sample household in every replicate will receive the same core questionnaire that will remain essentially the same over time. The core questionnaire will obtain information needed on an annual basis, have considerable year to year volatility, be important in monitoring food security issues, and provide an overview of progress towards meeting the MDG's. The design will provide longitudinal analysis of the core data so that short run evaluations of the effects of policy or investment decisions can be appraised.

The key to the design is that each year each household is also surveyed by a detailed questionnaire that rotates by subject matter each year. The variables to be measured on a rotating basis are those for which change would be difficult to monitor on an annual basis. During the period a household is in the sample, it will be queried by each of the detailed questionnaires at least once with one fifth of the households surveyed twice for one of the detailed questionnaires.

At the end of the fifth year a household in the sample will have been surveyed annually for the core items, once for each detailed questionnaire, and twice for one of the detailed versions. In this way the survey will provide a matching sample comparison over time.

VII.6.2 FRAMEWORK TO DEVELOP A MASTER SAMPLING FRAME AND MASTER SAMPLES FOR AGRICULTURE

Ad hoc scheduling of surveys has now been replaced in many National Survey Offices (NSOs) with long range plans in which surveys covering different topics are conducted continuously or at regular intervals. The United Nations National Household Survey Capability Programme and the methodology suggested by the *Global Strategy to Improve Agricultural and Rural Statistics* (World Bank *et al.*, 2011) play an important role in this process. The development of a master sampling frame (MSF) for agriculture is often an important part of an integrated household survey programme. It starts by defining the population parameters, which are the physical land mass and natural environment of the country, the economic output of agriculture, and the well-being of the farm and rural populations. For data-collection purposes, the population needs to be defined in terms of the unit of measure or the statistical units.

The statistical units defined in the conceptual framework include the farm or agricultural holding, the household, and the land parcels. The conceptual framework requires a link between the economic, environmental, and social dimensions and their statistical units. This implies the need for georeferencing the farms and households. All of these issues are considered in the development of the master sample frame.

Focus on Some Examples of Sample Frames Used for Agricultural Statistics

A very common type of MSF is one with census enumeration areas as the basic frame units. Usually there is information for each unit that links the unit to higher level units (administrative subdivisions). For each unit there may be information on urban/rural classification and identification of higher level units. For each area unit there must also be information on the boundaries of the unit.

Developing countries often use the enumeration or administrative areas established for the population census as the sample frame. Samples of farms are obtained by first selecting enumeration areas, screening them for farms or households, and then selecting a subsample for the surveys. Other countries prepare registers of farms for sampling purposes and must devote considerable resources to keep them up-to-date. A less used approach is an area sample frame, which is essentially the country's land mass divided into sampling units (Gallego, 1995). Many of the requirements posed by the Global Strategy point to an increased use of area frame methodologies. A final approach is to use multiple frames (FAO, 1998) to create a master frame that builds on the advantages of area frames and registers. The master sample frame must provide the basis for the selection of probability-based samples of farms and households with the capability to link the farm characteristics with the household and then connect both to the land cover and use dimensions. The area sample frame meets this requirement. The most important source of data and materials will usually be the latest population census. Its quality deteriorates over time, for this reason the MSF is normally completely revised after each population census, usually every ten years.

An up-to-date MSF with built in flexibility has advantages apart from the cost and quality aspects; it facilitates quick and easy selection of samples for surveys of different kinds and it could meet different requirements on the sample from the surveys. The methodology using the population census recommended for the *World Program for the Census of Agriculture* (FAO 2005) will also meet this requirement - if households from the population census are georeferenced and used as the frame for the agricultural census and linked to satellite images of land use. At this stage, only a limited number of countries have included agriculture in their population census. According to information from FAO, only 71 countries out of a total of 189 have plans to undertake an agricultural census during 2006–2015. Given these constraints, it becomes important to provide alternative methods to develop the master sample frame for agriculture.

The strategy recommended by the *Global Strategy to Improve Agricultural and Rural Statistics* (World Bank *et al.*, 2011) starts with a long-term vision for how the master sample frame for agriculture should be developed. The strategy is mindful of differing levels of capacity between countries; therefore, alternative methods to develop the master sample frame are also provided. The *Global Strategy to Improve Agricultural and Rural Statistics* (World Bank *et al.*, 2011) states that "*The development of the master sample frame for agriculture begins with the need to link the economic and social dimensions of agriculture with those relating to land cover and other environmental issues. Because the master sample frame should be linked to land use, obtaining satellite imagery of the country's area is a useful starting point. The land cover as recorded by the satellite imagery should be classified into major categories such as cultivated land, woodlands, grasslands, idle land, and urban areas. Unless land use is changing rapidly, this imagery only needs to be updated periodically. This first step in creating the digitized land cover database should play a prominent role in efforts to build statistical capacity. Once the land-use mapping is complete, the next step is to georeference (or digitize) the population and agricultural census enumeration areas to the satellite imagery. Countries, districts, townships, and villages should be georeferenced so that they are associated with the land-cover imagery. This enables monitoring of land use over time, and can be used to relate land use to local administrative structures. This information becomes an important component of the master sample frame for agriculture. A number of strategies can then be*

employed to create a master sample frame. The first method discussed below is used to establish a link between the agricultural master sample frame and the population census. Given the fact that the link cannot be made for many years because of the infrequent nature of population censuses, additional strategies are also offered for: countries with recent agricultural censuses; countries that use administrative data to construct a sample frame; and those that do not have recent agricultural censuses.

Coordinated population and agricultural census data collection. The basic information that should be obtained in the population census is whether the household is associated with a farm, and if so, what are the indicators of size, type, and the location of the land (census enumeration area or administrative unit)? This information can be used to create a register of households and farms with their land linked to georeferenced census enumeration areas or administrative units. In census enumeration areas in which agricultural data are collected, nonfarm households should be included in the register. This will provide a link between the agricultural data and all characteristics contained in the population register. While linking data from farm censuses and from population censuses provides a powerful tool for data analysis, several issues will need to be resolved. First, confidentiality rules may limit how the census data can be used to construct a master frame for agriculture. In addition, the register will need to be supplemented by a register of commercial farms not associated with households in order to provide a complete register for agricultural surveys. A more ideal approach would be to use the household or farm register as an input into the agricultural census. Then the master frame for agriculture would be the same as described below when a census of agriculture is the base.

Master sample frame from an agricultural census. The development of the master sample frame using the agricultural census includes the need to associate farms with households and both with land use. Historically, the reporting unit for the agricultural census is the farm. The first step is for data collection not only to define the farm along with obtaining production and economic information, but also to obtain information about the household(s) associated with the farm and their characteristics. The coverage of the census should be inclusive of both commercial and small-scale farms plus subsistence farming households. The goal should be that the farms counted in the census be used to develop a register, and each farm should be associated with a household unless it is a corporate or institutional farm. A problem is that the point of data collection is the farm headquarters or household whose distance from the land holding poses difficulties for georeferencing each land holding to land use. Therefore, land associated with each farm and associated household needs to be linked to the appropriate georeferenced census enumeration areas or administrative units, or both. In this example, the master sample frame for agriculture will be a register of farms or households and commercial farm enterprises with their land georeferenced to enumeration areas or administrative units. Where the census is repeated at 10-year intervals, it will be necessary to update the register in the interim period using administrative information. An alternative procedure is to use two-stage sampling in which the first stage is census enumeration areas or administrative units. The first stage units could be screened annually for updating purposes. The georeferencing of farms or households to the census enumeration or the administrative units that are part of the data layer in the satellite imagery in effect establishes an area sample frame—and becomes the master sample frame for agriculture.

Countries using administrative data to construct registers of-farms. The procedures described above to develop a master sample using the census of agriculture should also be followed where information from administrative sources such as tax records, licensing, or regulatory registers is available. However, additional steps may be required if the administrative data do not include small or subsistence farms. This could include selecting samples of administrative units or census enumeration areas, which would be screened for small and subsistence farms. Again, the georeferencing of the farms or households in the business register to either census enumeration or administrative areas in effect establishes an area sampling frame – which becomes the master sample frame for agriculture.

Master sample frame when there is not a recent agricultural census. The starting point should be the development of an area sample frame. The georeferenced satellite imagery by land-use category can also be used as the basis for an area sample frame as described by Gallego (1995). The land-use characteristics of the country should be used to select the sampling unit – segments with identifiable boundaries or a sample of points. Either method can be used with rules of association during data collection to assign both farms and related households to the segment or point that will be already georeferenced to land use. The data quality dimension of completeness is satisfied because the entire country is mapped and every farm, household, and parcel of land has a known probability of selection. It is also comparable because the same segments or points can be used for multiple surveys and over time. Once the country has established the area frame, it may begin creating a list register of large or specialized farms to use in a multiple frame context. Nevertheless, the area frame described above becomes the master sample frame for agriculture with the capability to directly link or georeference the farm or household to its associated land holding. This is an important advantage, as the households can be located in villages some distance from the land holding.

The sample segments or points should also be associated with the census enumeration areas or administrative units. The link of the sample units with census enumeration areas also puts the master frame into the population census framework. In summary, the master sample frame for agriculture can be established several ways. The common element for the three methods provided above is the georeferencing of census enumeration areas and administrative units to digitized satellite imagery classified by major land cover. The area frame sampling units can be directly associated with the land-cover classification. The land associated with the farms, households, and enterprises in the census or administrative registers is indirectly associated with land cover via the mapping to the census enumeration area or an administrative unit. A longer-term goal would be to georeference each parcel associated with an agricultural holding directly to the satellite imagery. Once the master sample frame of farms and households has been established, the next and longer-term step is to create a register of agricultural enterprises that furnish inputs, provide transportation, and are the first-stage processors of crop and animal products. The master sample frame enables the use of a rich assortment of sample designs including single – and multiple-stage sampling. If enumeration or administrative areas are the first stage of sampling, they can be selected with probabilities proportional to measures of size reported in the population or agricultural censuses. The use of enumeration or administrative areas provides a means of selecting farms, households, or a combination of them as the statistical unit.

Landing sites are the appropriate unit for surveying capture fishery production, while the master sample frame can be used to monitor other fishery-related units such as households, holdings, and enterprises. When utilizing landing sites as the sampling unit for data collection of capture production, the survey on the other aspects of the fishery sector will need to include questions about the landing sites used by each household, holding, and enterprise to allow integration of two different sampling schemes."

> *"The underlying principle is that the master sample frame be the source for all samples for surveys of agricultural holdings, farm households, and rural nonfarm households. This means the samples can be designed so that data can be analyzed across surveys. Once the master sample frame has been developed, it should be possible for different institutions in the national statistical system to access the master sample for survey purposes with another guiding principle that the resulting data be available for analysis across other data collections."* World Bank, FAO and UNSC (2011). *Global Strategy to Improve Agricultural and Rural Statistics*. Source: Report no 56719-GLB. World Bank, Washington DC, p22.

VII.7 OTHER TYPES OF SURVEYS

In **developed countries** where agriculture is rather marginal from an employment and economic sector perspective, **business surveys** and **structural business statistics** play a more dominant role as data sources than do farm surveys (dealt with above). These surveys, which are carried out frequently, can provide detailed information about the type of economic activities, their relative size in monetary and employment terms as well as their dynamics. However, the shortcomings are that they provide only a rather aggregated territorial breakdown, in the best case by major regions. **Statistical business registers**, which constitute the frames for business surveys, do contain information with a detailed territorial breakdown and these can be a very useful source for analysing rural business structure. The variables recorded for enterprises, besides information about location, type of business and owner structures are often limited to employment, wages, and gross output. This limitation could, however, be overcome by creating links between the business surveys and exhaustive processing of the data in business registers.

Health and education, which are also important variables with respect to rural development analysis, are partly covered in population censuses, HBS's and labour force surveys. However, for more detailed analysis specialized surveys in health and education are often required.

Moreover, **satellite imagery** is becoming increasingly accessible, and its resolution has improved to the point that individual fields are relatively easy to identify. Even if its use is unlikely to replace field surveys, it can be added to these tools for monitoring and evaluating agricultural development. Satellite imagery is also useful in developing sampling frames and as a basis for surveys. The methodology of sampling is now well developed and is in the arsenal of tools advocated by FAO. Some of the more interesting recent breakthroughs in poverty monitoring include the combined use of imagery, census data and household survey data, which together can be used to create dynamic

poverty maps showing changes to key variables over relatively short time periods. Satellite imagery can also be used in developing area sampling frames as basis for area-based surveys, including point sampling.

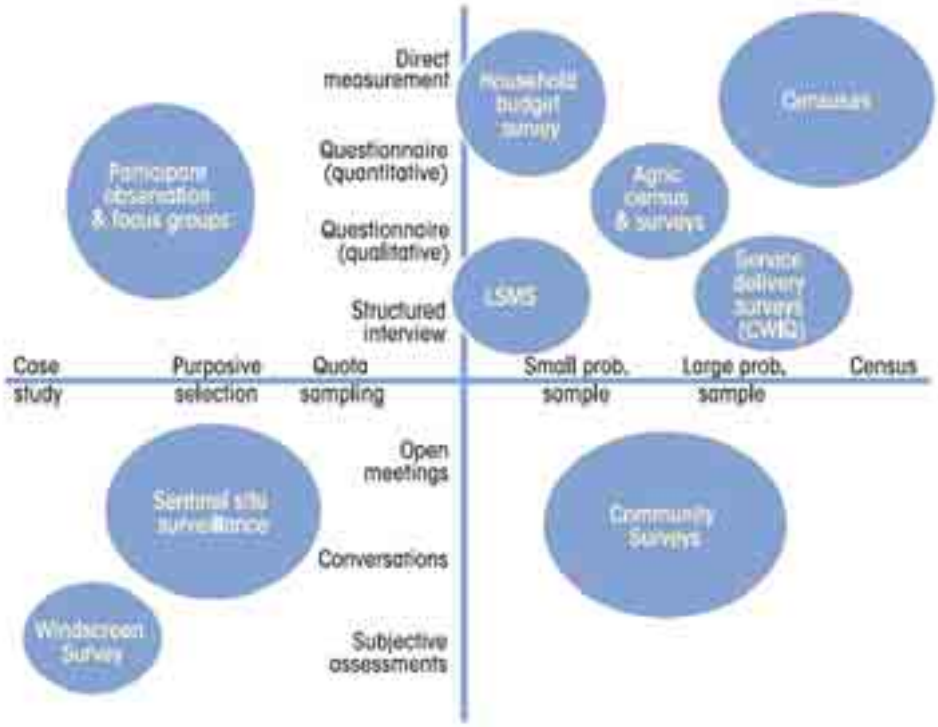
VII.7.1 INFORMAL AND QUALITATIVE SURVEYS

In the past 30 years or so, a substantial literature and a considerable amount of experience has been developed on the use of what are often called participatory appraisal or qualitative methods for compiling information about agricultural households and rural communities. Originating first in South Asia they have been applied in a wide range of circumstances, mostly in developing countries (Chambers, 2004). The range of approaches and techniques used is increasing rapidly, but they all include a number of common characteristics including: involving respondents, usually people living in rural communities in the design and the application of the approach; making use of local knowledge and expertise; using a variety of techniques for obtaining information, but usually not a formal questionnaire; making use of a facilitator rather than an enumerator, whose role is to discuss issues and record information rather than extract data; and ensuring that the participants in the process not only provide the information, but are also actively involved in its analysis and interpretation.

More recently there has been increasing interest in bringing together both quantitative and qualitative survey methods, to take advantage of the strengths of both (Kagugube *et al*., 2009 and Shaffer *et al*., 2009). Increasingly they are being seen as complementary rather than competitors and some authors have demonstrated ways in which qualitative methods can provide useful and reliable statistical data (Barahona *et al*., 2002)

Figure VII.2 compares and contrasts formal statistical surveys with non-formal appraisal methods. Most of the statistical surveys are to be found in the top right-hand quadrant, whereas the more qualitative studies tend to be clustered in the lower left-hand quadrant.

FIGURE VII.2
Tools for measuring results: surveys vs. non-formal appraisal methods



Source: *Tracking results in agriculture and rural development in less-than-ideal conditions. A sourcebook of indicators for monitoring and evaluation*. GDPRD, FAO and The World Bank, 2008

Different surveys have different costs, and with some simple procedures, a household survey using point sampling could be designed that could minimize expense and time as compared to list framers.

FIGURE VII.4
Comparison of key features of different surveys

	1	2	3	4	5	BEST USED FOR		
	SAMPLE SIZE	DURATION	VISIT TO HOUSEHOLDS	QUESTIONN-AIRE SIZE	COST (US$M)	Time Series	Cross-sectional	Counter factual
POPULATION CENSUS	Full coverage	3 - 6 months	1	4 - 8	15 - 25	x	√√	x
AGRICULTURAL CENSUS/ SURVEY	20.000 - 40.000	1 - 1.5 years	2 - 4	8 - 12	8 - 12	x	√√	x
LSMS/ INTEGRATED SURVEY	5.000 - 10.000	1 - 1.5 years	2	40+	1 - 2	x	√	√√
HOUSEHOLD BUDGET SURVEY	4.000 - 10.000	1 - 1.5 years	15 - 25	15 - 20	1 - 2	x	X	√√
COMMUNITY SURVEY	100-500	4 - 6 months	1	4 - 6	0.2 - 0.4	√	√	X
SERVICE DELIVERY SURVEY (CWIQ)	10.000 - 15.000	2 - 3 months	1	8	0.2 - 0.4	√√	√	X
FOCUS GROUP INTERVIEWS	40 - 50	2 - 3 months	1 - 3	_	0.05 - 0.1	√	x	√
WINDSCREEN SURVEY	Oct-20	2 - 3 weeks	0		0.01	√	x	x

Source: *Tracking results in agriculture and rural development in less-than-ideal conditions. A sourcebook of indicators for monitoring and evaluation*. GDPRD, FAO and The World Bank, 2008

VII.8 ADMINISTRATIVE REGISTERS

Administrative registers are another important source for rural statistics and have the advantage that they are readily available and are normally much less expensive to use than surveys. Despite the fact that they are subject to confidentiality laws with regard to how they can be used, they have wide national coverage and the administrative arrangements are such that relevant statistics can be extracted. It must be remembered that the definition of key concepts such as employment, unemployment and type of occupation might not be the same as those that would be used for statistical surveys, as the registers are set up for administrative purposes. In addition, the arrangements in administrative registers can change frequently, leading to discontinuity. Finally, they also have the weakness that they have a purely national policy perspective. This means that, for instance, registers for social insurance systems vary greatly between countries.

However, in some countries, notably the Nordic countries, register data are very well developed and can produce excellent statistics as well as providing sampling frames. The type of registers mainly used for rural development statistics are population registers, tax registers (including VAT registers), vehicle registers, social security registers and insurance registers. The use of tax registers as a data source for statistics specifically on the incomes of agricultural households is dealt with in Chapter XIII of this Handbook.

VII.8.1 VITAL STATISTICS RECORDS

Statistics on births and deaths are required to estimate net migration rates for a locality. If the Population Census only asks about residence in the previous year it provides only a very partial glimpse of migration. Moreover, since the number of people who migrate in a year is relatively small, estimates for small territorial units are likely to be unreliable. With vital statistics records, one may estimate net migration relatively precisely for the entire period between censuses, under the assumption that census population counts at the ends of the time interval were equally reliable. Care must be taken, however, that the residences recorded for births and deaths are the usual places of residence and match what is recorded in the Census.

Infant and age-standardized mortality rates are sometimes used as health measures. However, death rates are often so low that frequently one has to average mortality rates over several years to obtain a reliable measure for small localities.

VII.9 NON-OFFICIAL STATISTICS (e.g. from trade associations)

For certain variables of interest for rural development statistics (for example, tourism, recreation, rural amenities, local business structures and supply of cultural activities), the available sources might not be from official statistics but rather produced by trade associations, local agencies and authorities, or societies and clubs (e.g. sport or cultural). If such information is used, much attention must be given to how the statistics were generated, what definitions were used, whether they are compatible with official

definitions and how the data were collected and processed. In addition, the results might serve the interests of the collecting organisation and may not be totally objective. An example of this would be data on the numbers engaged in certain cultural and educational activities where the results are tied to the provision of public or private funding for those activities. To this should be added that non-official statistics are often neither exhaustive nor based on probability sampling.

It is also problematical when statistics from these sources are combined with official statistics in order to create indicators. Here the rural statistician must be extremely careful and scrutinize compatibility and coverage of the sources. If such indicators are used, the statistician should clearly indicate not only sources, methods and individual meta-data but also how the indicator should be interpreted and with what precision.

VII.10 GIS AND GEO-CODED STATISTICS

An increasing amount of information is being made available through Geographic Information Systems (GIS). These systems attach geographic identifiers to data, allowing them to be mapped. To visualize geographic congruence or other relationships, users can superimpose one map upon another, or create a many-layered map. The standard road map, which often contains information about topography, cities and towns, and rivers and lakes as well as roads and highways, is a type of layered map. With GIS one might add a layer of soil type or agricultural products. This would provide information on how agricultural products vary with elevation and distance from a major town, for example.

All data attached to place or area, including data from censuses, satellite imaging, and geological studies, can be included as long as there are geographic identifiers (longitude and latitude) attached. For areas such as political jurisdictions, this means having “shape files”, which provide coordinates for the jurisdictional boundaries. This creates an enormously powerful analytical tool, as ecological data can be combined with demographic, economic, and social data relatively easily, once the system is established. It is also possible to extract data files relating to given types of localities. Thus, one could, for instance, create a table that crossed commune or township elevation with type of agricultural product or income.

Much of the information available through GIS systems is already available for standard geographic units (townships, communes, etc.). Thus, someone may already have created a data set with average elevation that could be attached to a land use file. However, the mapping of the data creates many new opportunities for the development of geographical or ecological indicators that remain largely unexplored.

First, GIS may be used to develop environmental measures for localities. Examples include the proportion of the territory that is occupied by a lake or pond (or, alternatively, miles of lake shoreline), average elevation, and topographic variation. All of these measures may relate to the attractiveness of the area as a place of residence. Other measures might include miles of autoroute or major roads in an area or road density.

Second, GIS may be used for generating information about distances and neighbouring areas. For instance, with a health facilities database in GIS and a road system layer, it would be possible to estimate driving times to a regional hospital for populations in territorial units lacking hospitals. Economic well-being of residents in territorial units may relate to job growth not only in the place or area of residence, but also in neighbouring territorial units that are within commuting range.

Third, GIS may be used to define new socioeconomic units. For instance, with data on commuting or shopping patterns, one can use GIS to define labour market or market centre service areas and generate statistics for those areas.

Finally, GIS can be used to map information based on political units onto ecological units such as river basins or agricultural zones where these zones form the unit of analysis.

The application of environmental measures is not always straightforward. Distances or lengths that are measured can depend on how small the basic unit of measurement is. Variegated shorelines, for instance, vary in estimated length depending on the whether one selects a measurement unit that pick up every inlet or a measurement unit that will not. Much environmental data, such as climate and air or water pollution, is collected at data points. Statisticians have developed various methods such as "krieging" to estimate climate and air quality between data collection points, but these estimates are not necessarily precise where the terrain is mountainous or uneven.

FAO has published in the past decades several methodological documents dealing with the estimation of crop area, yield and production. These were consolidated in a reference document produced in 1982 on the estimation of crop areas and yields in agricultural statistics which is still widely used by agricultural statisticians in the field.

FAO, together with JRC, CIRAD and WFP, is currently drafting the "*Handbook on Measuring Crop Area in Agricultural Censuses and Surveys, Guidelines for Use of Modern Geo-Positioning Devices (GPS/PDA)*" (Carfagna *et al.*; 2010).

China provides an interesting case study where GIS and remote sensing technology, together with the use of mobile phones, are enabling an updating of statistical systems that were no longer capable of meeting needs.

Focus on Handbook on Measuring Crop Area in Agricultural Censuses and Surveys

Focus on the Application GIS, Remote Sensing and ICT to Chinese Agricultural Statistics

VII.11 CONCLUSIONS AND RECOMMENDATIONS

This chapter has demonstrated that the rural development statistician must base work on a **multitude of statistical sources**. These calls for the statistician to pay very strong attention to the:

- Definitions used in the various sources;
- Differences in coverage;
- Difference in precision;
- Problems of mixing sources in order to create indicators.

All sample surveys are subject to both sampling errors and non-sampling errors (unwillingness of respondents to provide correct answers, misunderstanding the questions, non-response, mistakes by the interviewers, miscoding etc.). It is therefore important that rural development statisticians indicate as far as possible the reliability of each of the sources used.

Survey data should be exposed to data checking, for instance by using **consistency check** programs. Of particular importance is that rural development statisticians be aware of how the particular survey has treated missing data, as these will seriously affect the quality of the data sets. There are several possible approaches to the problem of **missing data**. If the household or the person included in the survey cannot be re-interviewed, then the best solution is to impute the data. There are several methods available to achieve this. However, if for a particular household or person too many variables contain errors or are missing, that household or person should probably be removed. In this case the weighting has to be adjusted.

When procedures for the imputation of missing data, or correction of data, are used, the rural development statistician must clearly indicate which procedures have been used and how they might affect the results. If the rural development statisticians cannot control these issues (which is often the case), they should at least be informed how the particular survey has treated them, so that this is properly recorded in the meta-data.

Though more an issue of publication than a characteristic of data sources, Statistical Disclosure Limitation (SDL) has become a major concern for statistical agencies as surveys and censuses are usually taken with an explicit understanding that personal or establishment information will not be revealed. Reasonable response rates depend on the belief that respondents have that their answers will be kept in confidence. There are numerous methods of SDL. For table presentation, the most frequent is to suppress data in cells with below a certain number of responses. SDL must be considered as a strategy, however, and not dealt with piecemeal, on a table by table basis, for instance. It is sometimes possible to combine information from different tables, sometimes released in different reports, to ascertain confidential information that is suppressed in any single table.

As has been pointed out several times, rural development statistics in this Handbook focus on the **well-being of the household** in various categories of territorial areas. As

the household is the main statistical unit for which production, income and consumption is measured, the underlying definitions must be clearly indicated and tested for consistency as well as compared with other countries. In this Handbook it has been said that, as in many cases there are large variations in definition and coverage of variables between countries, **it may not be advisable to benchmark levels but rather to benchmark changes in levels.**

Within a country there might be quite significant differences in income between regions. In these cases there are normally also significant differences in price levels, in particular for housing, food and certain services. This calls for to the use as far as it possible of **income measures expressed in purchasing power.**

Comparison of the relative purchasing power between regions can be done in several ways using (Ball and Fenwick, 2003):

- National weights, which enables comparisons for a uniform basket of goods between regions and the national average as well as between regions;
- Regional weights, by pricing the cost of regional representative baskets. This enable comparisons to be made for a representative basket of goods for each individual region, compared with what that basket would have cost at national average prices; and
- A geometric mean of national and regional weights.

Rural development statistics must be based on a multitude of statistical sources, which are not always compatible. This Handbook strongly endorses, as good practice, the publication together with the statistics of a detailed analysis of the sources and methods used, adequate meta-data for the individual data cells, and a readers' guide, advising how the results should be interpreted and with what precision.

For international benchmarking the above should be recorded for each country. If incompatibilities exist, these must be clearly indicated, together with a guide to what extent data indicator levels can in fact be compared. If they cannot, only changes in levels of indicators should be recorded.

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Focus on Recommendations for the 2000 Censuses of Population and Housing in the ECE Region

The scope of the **UNECE/Eurostat** joint recommendations[1] is limited to the following three elements: (a) a list of "core" topics which countries should cover in their censuses, and recommended definitions and classifications for each of the core topics; (b) a list of "non-core" topics which countries may wish to consider including in their censuses, and suggested definitions and/or classifications for some of the non-core topics, and (c) a basic set of tabulation programmes.

The data collection could involve both a short form (with selected questions) and a long form (with more questions). The long form is completed for a sample of households or people. Alternatively, one form could be used, but when this is done, a sample is often selected for processing certain questions: for example, those which could be costly to process, such as industry and occupation.

Some countries are using registers and other administrative sources, together with information from sample surveys, to provide census-type statistics. Other countries are able to collect all relevant information by combining data from different registers. Still other countries can get part of the information from registers and other administrative sources – often information on persons – but have to supplement these by using questionnaires, particularly as there are difficulties in putting new items required for statistical purposes into administrative registers.

Six units of enumeration may be used in population and housing censuses tables:

1. Persons
2. Private households
3. Institutional households
4. Family nuclei
5. Living quarters (e.g. housing units and living quarters other than housing units, such as institutions); and
6. Buildings

In statistical terms, these concepts are clearly distinguishable, and the terms are not themselves interchangeable. Some households contain more than one family, several households may live together in a housing unit and, exceptionally, a single household may occupy more than one housing unit as its usual place of residence. Similarly, a building may contain several housing units and a housing unit may, exceptionally, be located in more than one building, for example, in the case of dwellings comprising a

[1]United Nations (UN) and the Statistical Office of the European Communities (1998) "*Recommendations for the 2000 Censuses of Population and Housing in the ECE Region*". Jointly prepared by the United Nations Economic Commission for Europe and the Statistical Office of the European Communities New York and Geneva. Statistical Standards and Studies – No.49.

main building and a room or rooms above a detached garage that are clearly designed to be used as part of the dwelling (see also Chapter IX of this Handbook).

The UNECE/Eurostat Recommendations contain the following 29 core topics. Those that are of particular importance for rural development statistics are briefly annotated. There are also 52 non-core topics recommended for countries that have the means of covering them. Some of these are also briefly mentioned.

Geographic characteristics of persons

1. Place of usual residence

2. Place of usual residence one year prior to the census

Demographic characteristics of persons

3. Sex

4. Age

5. Legal marital status

6. Country/place of birth

7. Country of citizenship

Economic characteristics of persons

8. Current activity status

This is the current relationship of a person to economic activity, based on a brief reference period, preferably the previous week. The use of the "current activity" is considered most appropriate for countries where the economic activity of people is not influenced much by seasonal or other factors causing variations over the year.

The "currently active population" (the "labour force") comprises all persons who fulfil the requirements for inclusion among the employed or the unemployed. "Employed" persons comprise all persons above a specified age who, during the reference period, performed some work for pay or profit, in cash or in kind, or were temporarily absent from a job in which they had already worked and to which they had a formal attachment, or from a self-employment activity such as a farm, a business enterprise or a service undertaking. The census documentation and tabulations should clearly describe the time limit chosen as the cut-off for considering persons to be "at work." According to the present international recommendations, the notion of "some work" should be interpreted as work for at least one hour during the reference period. The one-hour criterion is an essential feature of the labour force framework embedded in the international definitions of employment and unemployment, and a prerequisite for the consistency of employment statistics with national accounts data on production.

Countries concerned about the usefulness of the one-hour criterion for other users of census results should also collect data on "time worked"[2].

9. Time usually worked

10. Occupation

"Occupation" refers to the type of work done in a job. "Type of work" is described by the main tasks and duties of the work[3].

11. Industry (branch of economic activity)

"Industry (branch of economic activity)" refers to the kind of production or activity of the establishment or other unit in which the job(s) of the economically active person was located (or, in the case of unemployed, last located). For purposes of international comparability, it is recommended that countries compile the industrial characteristics of active persons according to the latest revision of the International Standard Industrial Classification of All Economic Activities (ISIC) available at the time of the census.

12. Status in employment

"Status in employment" refers to the type of explicit or implicit contract of employment with other persons or organizations, which the person has in his/her job. The basic criteria used to define the groups of the classification are the type of economic risk, an element of which is the strength of the attachment between the person and the job, and the type of authority over establishments and other workers, which the person has or will have in the job. Care should be taken to ensure that an "economically active" person is classified by "status in employment" on the basis of the same job(s) as used for classifying the person by "occupation," "industry" and "sector."

It is recommended that the economically active population be classified by status in employment as follows:

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[2] "Labour force, employment, unemployment and underemployment" were subjects considered at the 13th International Conferences of Labour Statisticians in 1982. It resulted in a resolution, which represents the current ILO recommendations on the subject http://www.ilo.org/public/english/bureau/stat/techmeet/icls/subjects.htm

[3] An original ILO (LABORSTA) database was compiled from responses to a questionnaire sent to countries that were known to have coded the variable "occupation" using more than 20 occupational groups in their last Population Census or Labour Force (or Household) Survey. The ILO only included in the original database those countries that provided adequate data by sex for at least 15 occupational groups. This reduced the number of countries included to 40: six that provided data for only one year, 20 for two years and 14 for three. Geographical representation was unequal: only five African countries, two Latin American and two Caribbean countries provided data, in contrast with nine Asian and 18 European countries.
The updated ILO database was compiled from responses to a similar questionnaire sent to all countries. With this strategy the ILO managed to increase the total coverage to 85 countries and territories of which there were: 11 in Africa, 15 in the Americas, 4 in the Arab region, 13 from other Asian countries, 18 from Transition Economies, 20 from other European countries and 4 in Oceania, for years around 1970 (58 countries), 1980 (52), 1990 (58) and 2000 (47). Most of the statistics that were provided were based on census results (ILO, 2003a; 2003b).

1. "Employees", among whom it may be possible to distinguish "employees with stable contracts" (including "regular employees");
2. "Employers;"
3. "Own-account workers;"
4. "Contributing family workers;"
5. "Members of producers' cooperatives;"
6. "Persons not classifiable by status."

It is also recommended to identify separately "Owner-managers of incorporated enterprises," who normally will be classified among "employees," but whom one may prefer, for certain descriptive and analytical purposes, to group together with "employers"[4].

13. Place of work

Place of work is the location in which a "currently employed" person performs his/her job, and where a "usually employed" person currently performs or last performed the job. While the information on place of work can be used to develop area profiles in terms of the employed labour force (as opposed to demographic profiles by place of residence), the primary objective is to link the place of work information to the place of residence. Therefore, the place of work should relate to the smallest civil division in which the economic activity is performed in order to establish commuter flows from the place of usual residence to the place of work.

A non-core topic related to place of work is **mode of transport to work**, which relates to the daily journey made. For people making several journeys or using more than one mode of transport, the mode of transport used for the greatest distance in the journey should be indicated.

Another non-core topic, which is important for rural development statistics, is **length (in distance and time) and frequency of journey to work**.

[4] The ILO also provides an indicator of status in employment, which distinguishes between three important and useful categories of the total employed. These are: (a) wage and salaried workers (also known as employees); (b) self-employed workers; and (c) contributing family workers (also known as unpaid family workers). These three groups of workers are presented as percentages of the total employed for both sexes and for males and females separately. Information on the subcategories of the self-employed group – self-employed workers with employees (employers) and self-employed workers without employees (own-account workers) – is not available for all economies but is presented wherever possible.
The indicator on status in employment is available for most developed (industrialized) and transition economies, as well as for many Eastern Asian, Latin American and Caribbean economies. Unfortunately, there are only a few sub-Saharan African economies for which this indicator is available and, where coverage does exist, extensive time series are lacking. Currently, information is also unavailable for some large developing economies, such as China and India. Information for the indicator, at least to some extent, is available for 129 economies
http://www.ilo.org./public/english/employment/strat/kilm/kilm03.htm

Educational characteristics of persons

14. Educational attainment

For purposes of international comparisons, it is recommended that countries compile their data in accordance with the latest revision of the **International Standard Classification of Education (ISCED).**

"Educational attainment" refers essentially to the highest level successfully completed in the educational system of the country where the education was received. If relevant, "educational attainment" should take into account all deliberate, systematic and organized communication, designed to bring about learning, even if these were provided outside schools and universities.

At least four levels of education should be normally distinguished: primary; secondary - first stage; secondary - second stage; and post secondary. Persons who have received no formal schooling should also be identified. Ideally, educational statistics should be based on the working age population[5].

Household and family characteristics of persons

Countries are recommended to use the place of usual residence as the basis of household membership. If only *de jure* information is available (e.g. from registers) on place of residence, e.g. no information is available on usual place of residence, then that information can be used (alone or in combination with other information from other sources) provided that it is judged to reflect the usual residence situation sufficiently accurately.

The concept of "usual residence" is not without ambiguities. Are children away at school or post-secondary school still considered residents of their parents' locality or are they residents of the place where they are schooled? In general, the latter is preferred as that is the residence at the time of the census or survey.

A private household is either:

- a one-person household, e.g. a person who lives alone in a separate housing unit or who occupies, as a lodger, a separate room (or rooms) of a

[5] The ILO covers two relevant indicators: KILM 11 on Unemployment by educational attainment and KILM 14 on Educational attainment and illiteracy.
KILM 11 focuses on unemployment among workers categorized by their level of educational attainment. Specifically, the indicator is the percentage distribution of an economy's total unemployed according to five levels of schooling - less than one year, less than primary level, primary level, secondary level and tertiary level. Coverage for the indicator is sparse for sub-Saharan Africa, the Middle East and North Africa. Many economies of Asia and the Pacific are also missing.
KILM 14 reflects the levels and distribution of the knowledge and skills base of the labour force. The indicator includes two measures pertaining to educational level of the labour force, and a third measure estimating illiteracy in the adult population. The indicator covers the educational attainment of both women and men in the entire labour force and shows the distribution of the educational attainment of the labour force aged 15 years and above for 104 economies (sources: http://www.ilo.org./public/english/employment/strat/kilm/kilm14.htm
http://www.ilo.org./public/english/employment/strat/kilm/kilm11.htm

housing unit but does not join with any of the other occupants of the housing unit to form part of a multi-person household as defined below; or

- a multi-person household, e.g. a group of two or more persons who combine to occupy the whole or part of a housing unit and to provide themselves with food and possibly other essentials for living. Members of the group may pool their incomes to a greater or lesser extent.

This concept of a private household, referred to as the housekeeping unit concept, requires some clarification on the distinction between "boarders" and "lodgers." Boarders take meals with the household and generally are allowed to use all the available household facilities. Lodgers, however, are sub-tenants who have hired part of the housing unit for their exclusive use.

Some countries use a different concept of the private household in which the private household is equated with the housing unit. This concept of the household is referred to as the household-dwelling concept, and is defined as the aggregate number of persons occupying a housing unit.

The household-dwelling concept does not provide direct information on the number of housekeeping units sharing housing units. It is recommended that countries applying the household-dwelling concept give an estimate of the total number of housekeeping units in the census report. If the difference between the number of household-dwelling units and the number of housekeeping units is significant, these countries should also endeavour to analyse the occupants of housing units in such a way that they are able to compile the recommended basic tabulations relating to private households on the basis of the housekeeping unit concept. Countries should specify in their census reports whether they used the "housekeeping unit" or the "household-dwelling" concept of a private household. (Chapter IX of this Handbook contains a detailed discussion of different household concepts in the context of measuring the incomes of agricultural households).

15. Relationship to reference person

Information should be collected for all persons living in private households on their relationship to the reference member of the household. Data on this topic are needed for use in (i) identifying households and family nuclei; and (ii) compiling tabulations in which households are classified according to characteristics of the reference member. It is left to countries to decide whether the reference member should be:

- The head of household or one of the joint heads;
- The person (or one of the persons) who owns or rents the housing unit or in whose name the housing unit is occupied under some other form of tenure or in whose name part of the housing unit is rented or occupied under some other form of tenure;
- An adult person selected with a view to facilitating the determination of family relationships; or
- A person selected on the basis of other criteria.

It is important that countries describe clearly in the census report the concept of the reference member that has been adopted and the definition that has been used. (Again, Chapter IX of this handbook also discusses this issue in the context of statistics on the incomes of agricultural households).

16. Tenure status of households

Non-core topics which are important for rural development statistics in this context are durable consumer goods possessed by the household, number of cars available for the use of the household and access to telephones, computers and Internet.

Characteristics of housing units and other living quarters

17. Type of living quarters

18. Type of ownership

19. Location of living quarters

20. Occupancy status

21. Number of occupants

22. Number of rooms

23. Kitchen

24. Water supply system

25. Toilet facilities

26. Bathing facilities

27. Type of heating

Characteristics of buildings containing dwellings

28. Type of building

29. Period of construction

For other issues with special importance for rural development statistics, it is recommended that information on place of usual residence should be collected in enough detail to enable tabulations to be made for the smallest geographic or administrative subdivisions required to meet users' needs for information on this topic.

In the UNECE/Eurostat Recommendations, it is suggested that countries which tabulate statistics only for civil divisions should, as a minimum, endeavour to compile data on the total population of each part of a civil division containing a population cluster, or part of a population cluster, of at least 2,000 inhabitants. This will provide a basis for making a more clear-cut distinction between urban and rural areas and populations. Specific size classes are also suggested.

The **division** in urban and rural areas is a derived non-core topic in the UNECE/Eurostat Recommendations. The **most appropriate unit of classification** for distinguishing

urban centres from rural areas is the **locality**[6]**.** While it is left to countries to decide whether to use the locality or the smallest civil division as the unit of classification, countries which use the smallest civil division are encouraged to obtain results which correspond as closely as possible with those obtained by countries which use the locality as the unit of classification.

It is suggested that localities or similar units be grouped into the following five categories:

A) Less than 2,000 inhabitants

B) 2,000 to 9,999 inhabitants

C) 10,000 to 99,999 inhabitants

D) 100,000 to 999,999 inhabitants

E) 1,000,000 or more inhabitants

Countries are also encouraged to develop typologies of localities or similar areas based on additional criteria that could be used to distinguish different types of areas within particular categories of the suggested classification. Some countries may wish to subdivide one or more of the intermediate categories to distinguish market towns, industrial centres, service centres, etc. or to subdivide the large urban agglomerations in order to distinguish various types of central and suburban areas. Extensions of the classification in these and other ways would enhance its analytical usefulness.

It is also suggested that for purposes of international comparisons, countries define urban centres as localities with a population of 2,000 or more, and rural areas to include localities with a population of less than 2,000 and sparsely populated areas. However, for some purposes, a threshold of 10,000 residents may be more appropriate.

This Handbook recognises as good practice that statistics on rural development should use regions as the geographical units of analysis rather than localities and open country areas. In industrialized countries, many people who now live in the countryside commute to major towns and cities for work. Their livelihoods are essentially urban livelihoods and they generally have access to a full range of urban services. At the same time, many small towns have lost urban functions as services have become more concentrated in urban agglomerations. Regions with only small towns may be considered rural regions even though some of the region's residents live in localities defined as urban on the basis of locality size. Urban regions typically have a large urban centre (50,000 or more population), while rural regions do not. However, one may also want to define intermediate regions on the basis of a city size of 10,000 or more and its commuting shed.

To enhance comparability across member countries, the OECD Territorial Indicators Project developed internationally comparable sets of regions based on population density of sub-regions and this is an alternative approach.

[6] This does not necessarily mean that locality is the unit for analysis but rather the unit for classification aspects. Normally, one should use localities for analysis of local issues and regions for analysis of regional issues.

Some countries might also wish to consider defining urban areas in other ways (for example, in terms of administrative boundaries, of built-up areas, of the area for which services such as shops, educational facilities, recreational facilities, employment, etc., are provided, or in terms of functional areas). Whatever approach is taken should be clearly described in the census report.

Focus on Some Examples of Sample Frames Used for Agricultural Statistics

The following material from Annex B of the *Global Strategy to Improve Agricultural and Rural Statistics* (World Bank *et al.,* 2011) lists the following examples of sample frames.

"Population census enumeration areas

The population census is usually conducted using an administrative structure in which cartographic or other mapping materials are used to divide the country into enumeration areas, which is the first level of data aggregation. Depending on the country's capabilities, the only results from the population census in some countries are the enumeration area totals for numbers of people, households, and so on. Therefore, the sampling frame is basically the listing of enumeration areas and associated aggregated data from the census. Random samples of enumeration areas are selected and screened for households from which subsamples are selected for household surveys - a two-stage sampling process. Some countries use their administrative structure of counties, townships, and villages as their framework for the census, with the village becoming the enumeration area. Villages are also used as a first-stage sampling unit in countries where the village is where the farm households are generally located.

Household registers from the population census

Countries with statistical capacity are able to develop a register of all households included in the population census. The list of population households is the sample frame used for household surveys. One problem is that the list of households becomes out-of-date with households changing or dissolving and new households being formed. Unless administrative data or other means are used to keep the population register up-to-date, survey results contain an increasing coverage bias over time.

Agricultural census enumeration areas

In many countries, the cartographic materials and data from the population census are used for the agricultural census. The sampling frame consists of enumeration areas and aggregated data from the census data collection. As in the population census, random samples of enumeration areas are selected and screened for farms or agricultural holdings for agricultural production surveys.

Registers of farms from the agricultural census

As in the household registers, countries with the capacity can use the agricultural census to develop registers of farms. This provides a powerful sampling tool because it allows a choice of many alternative sampling designs. A major weakness is that the registers rapidly become out-of-date. Out-of-date population and farm registers erode all of the data quality dimensions because the completeness of coverage changes over time, thus affecting the comparability and accuracy of the resulting estimates.

Registers of farms based on administrative sources such as business registrations or tax collections

This process is used in some developed countries. It offers the advantages of the registers from the agricultural census, but again, it needs to be updated regularly. A disadvantage of the administrative sources is that they may not include the total population, especially units below a threshold required to be registered or pay taxes. In other words, while they will be inclusive of commercial farms, they are not likely to include small-scale farms and subsistence farming units.

Area sample frames

An area sample frame is the land mass of the country or the space within a country containing the populations of interest. Both maps and satellite images are used to divide the country into administrative areas such as provinces, districts, and so forth. Satellite imagery can be used to subdivide the administrative areas into land-use categories such as cropland, rangeland, woodlands, urban areas, and so on. Sampling units of segments of land with identifiable boundaries can be formed, or each land-use stratum can be divided into square grids with a sample of points becoming the sampling units. During the data collection process, rules of association are used to connect farm holdings or households to the segments or points. An area frame is suitable for obtaining information about variables associated with land such as crops, livestock, forests, and water. Depending on the process used, area frames can be costly and time consuming to construct. However, recent innovations using satellite imagery and two-stage sampling of points have reduced both the cost and time. An advantage of an area frame is that the frame does not go out-of-date; it is complete in its coverage, and provides a basis to georeference survey data with the underlying land use. It also provides ground truth useful for classifying satellite imagery by land cover. The primary disadvantage of area frames is that the sampling is based on land use and not on the size and type of agricultural holding. Sampling variability becomes a problem if there is a large range in size of the agricultural holdings. A summary of the methodology of area-frame sampling is provided by Gallego (1995). Another disadvantage is that data-collection costs exceed those based on registers where telephone or mail can be used instead of personal interviews.

Multiple frames

A combination of the above frames is used, often involving the use of an area frame in conjunction with one of the list frames, to take advantage of the strengths and weaknesses of each. The United Nations Food and Agricultural Organization (FAO, 1998) provides an overview of multiple-frame sampling. This is appropriate where there is a large variation in the sizes and types of agricultural holdings with a subset of large commercial farms. The list of commercial farms can be stratified by size and type, and the area frame ensures the population is completely covered by providing coverage of the small and subsistence farms."

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Gallego, F.J. (1995). *Sampling Frames of Square Segments.* Report EUR 16317, Office of Official Publications of the European Communities, Joint Research Center, Ispra, Italy.

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World Bank, FAO and UNSC (2011). *Global Strategy to Improve Agricultural and Rural Statistics*. Report no 56719-GLB. World Bank, Washington DC.

Focus on Handbook on Measuring Crop Area in Agricultural Censuses and Surveys

The availability of reliable estimates of crop area, yield and production are an essential requirement of any country agricultural systems, as these variables are among any minimum set of key indicators for planning, monitoring and evaluation of agricultural and rural development programmes aiming at food security and raising the living standards of the population.

The importance of these variables spans in a range of policy issues, including:

- The determination of cultivation plans at national level (crop diversification)
- The elaboration and implementation of import and export policies of agricultural commodities and international trade negotiations
- The formulation of price policies (subsidies and incentives)
- The zoning or regionalisation of crop production according to the nature of the soil, the level of the yield etc.
- The establishment of a system for equitable distribution of crop production over different regions of the country
- The estimation of the contribution of agriculture to the gross domestic product and measuring the level of agriculture productivity
- The establishment of food balance sheet and other food security indicators.

Usually, the estimates of crop production are derived from its two components: area harvested and yields per unit area.

Nevertheless the former – crop area measurement – is a difficult, costly, and time-consuming undertaking. Moreover, many problems may arise depending on the methodology used in the collection of basic data or on differences in the units of measurement; other difficulties may stem from the presence of hills in the area investigated or the practice of mixed or associated cropping in the same field or plot.

The aim of the Handbook is to provide an introduction to the use of the new geo-positioning equipment (Global Positioning Systems, *GPS*; Personal Digital Assistant, *PDA*) instead of the traditional tapes and compass. Those technological advances may help survey statisticians by their relatively easy use, reducing time and cost with no significant loss of accuracy.

A preliminary definition of crop area in an agricultural statistics framework is thus required. This can be defined as 'the horizontal projection of a particular extent of the earth's surface', which corresponds to area shown on cadastral maps. This classification ensures that the total area is equal to the sum of component area which is not the case when areas are measured on slopes.

In turn, the concept of crop area has to be sub-divided in two groups: planted area and harvested area. Planted area data are necessary to estimate quantities used for seeding

purposes, while the latter is used to provide accurate and reliable yield and production data.

Additional concepts of area might be useful in considering the program of agriculture statistics, such as: area intended for planting; area sown or area intended for planting; area damaged or abandoned.

The main source of data on crop areas is land cadastre. Nevertheless, very few developing countries have well-performing land registration systems. For this reason, the censuses of agriculture and sample surveys constitute an essential source of information on crop areas.

It has also to be stressed that crop areas are only a part of a system of data on crops and related agricultural operations. For this reason, data on crop areas are not only important in themselves, but also in relation to statistics on many other topics for a comprehensive and analytical study of the characteristics of country agriculture.

Given this general framework, two broad families of crop area measurement methods can be distinguished: (i) Methods based on mapping material (in particular, area frame and remote sensing); (ii) Land surveying methods: measuring parcels and fields. An increasing number of countries are interested in using the methods based on mapping material, since the resolution of satellite images is becoming higher with substantial reduction in their cost and also with availability of powerful computer systems which can assist in the map based methods.

Nevertheless, even if remote sensing can contribute in many ways to the production of agricultural statistics, most developing countries still use frame with land surveying methods in their agricultural surveys for crop area measurement, where the typical instruments are compass, tape and calculator. This occurs for a variety of reasons and constraints which derive from the use of GPS in crop area measurement. The latter has thus to be evaluated mainly under two main criteria: accuracy (e.g. bias) and precision (e.g. reproducibility standard deviation).

Regarding the measurement accuracy, in general GPS provide a good estimate of the area considered. For instance, if the area measured with the traditional compass and meter is regarded as the benchmark, most GPS measurements are very close to the true area, although, in general, GPS tend to underestimate the area of plots. Referring to a linear regression framework, GPS estimates explain a very high percentage of the variability of the compass and tape measures (R-squared 0.9633), with parameters significantly different from the zero and the slope very near 1.

However, the accuracy of the estimate is negatively influenced by the presence of tree canopy cover; unfavourable weather conditions (e.g. it is higher with sun rather than with clouds); very fragmented size of the plots (the larger the size of the plots, the higher tend to be the accuracy of the GPS area measurements).

In addition, it has to be also considered that in the experiments carried out the measurement with compass and tape has been performed before using a GPS, and then using the compass and tape measurement as a benchmark. In operational projects, if

only one measurement with a GPS is performed, there is no possibility to have a yardstick to detect measurement mistakes. Therefore, in order to assess the performance of the GPS, both the accuracy and the precision of the particular device should be carefully evaluated through a validation test.

The results of such a test and the final evaluation of the measurement system should be thus discussed in the light of the precision level required in the project.

Moreover, data do not suggest that by repeating the measurement there are significant improvements in measurement quality and accuracy. On the contrary, it has to be borne in mind that – since measurement repetition is a cost and GPS measurement is in general 3.3 times faster than traditional methods – if two measurements have to be performed a careful cost-benefit analysis has to be done before deciding to replace the tape and compass method with the GPS.

Regarding operational use, battery life, robustness under difficult field conditions, simplicity of use should be taken into account when selecting a GPS type.

Given those caveats, GPS measurements open the door to spatial analysis of data and Geographical Information Systems (GIS).

Indeed, the mapping of the cropped areas in a GIS is an added value to the results of the assessment. This allows the dataset to be used in combination with remotely sensed images for modelling and ground-truthing, and for screening and early warning. Mapping of the cropped area perimeter will enable the data to be overlaid onto high resolution imagery.

The statistical information may be therefore combined with other sources of digitalised geographical data layers in order to improve the processes of modelling and monitoring in many fields such as climate forecast, soils maps, water resources and land cover images, just to name a few applications. In this way, the combination of the digital thematic maps, digital administrative boundaries and geo-referenced statistical information opens for spatial analyses of data.

However, before such data can be used in a long process of data capture, geo-referencing/geo-coding, scanning and digitalization is required. Since geographical information will be found in different organizations it is crucial for common use to agree upon standards and formats.

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FAO, JRC, CIRAD and WFP (2010). *Handbook on Measuring Crop Area in Agricultural Censuses and Surveys, Guidelines for Use of Modern Geo-Positioning Devices (GPS/PDA)*.

Focus on the Application of GIS, Remote Sensing and ICT to Chinese Agricultural Statistics[1]

In China parts of the agricultural statistics system were falling behind current needs. More rapid and more accurate survey data are required and there is an urgency to develop new methods and technology.

Applying new techniques, such as GIS, GPS and remote sensing to Chinese agricultural statistics is of great significance. The traditional statistic sampling method is subject to problems such as less representative samples and difficulty in usage of data that is classified as secret. Research into and applications of Geographic Information Systems (GIS) in China started in the early 1980s. In the early period, the development of GIS was mainly dependent on the progress and applications of remote sensing, aerial photography, as well as computer aided design (CAD). GIS is now a powerful tool for storing, retrieving, analyzing and integrating both spatial geographical data and non-spatial data. It attaches geographic identifiers to non-spatial data, allowing them to be mapped. This visualizes not only the data in geographic form, but also facilitates the use of spatial statistical techniques and remote sensing. In recent years, with the development of Global Positioning System (GPS) and Internet technology, GIS has being developed vigorously in the county. Looking ahead to the 21st century, a new era of "Digital Earth" is coming.

A GIS designed to assist agricultural surveys with the help of remote sensing data has been developed recently. The sampling units in crop surveys are based on an area frame obtained with the help of a satellite image or geographical areas such as villages, cities, regions, etc. Census data, survey data and satellite image of geographical area are all integrated into GIS.

The major change to crop surveys sampling design is the area frame construction, stratification and spatial sampling techniques. Recently, land use data had been collected from the second land survey, organized by the Ministry of Land and Resources of China in 2007. This survey collected all farmland vector data and latest years' SPOT5 imagery. Besides this, the attributes of land use were also collected. The data provides a good basis for area frame construction and some useful data for stratification. The farmland vector data is used to determine the boundaries of area frame strata and also the boundaries of segments. The current remote sensing data such as satellite images can not only provide updated information on area frame stratification boundaries and segment boundaries, but also provide ancillary information for optimizing the sample design when taking into account the positive spatial autocorrelation of characters under study.

Remote sensing data are generally used as auxiliary variables in regression estimation. The use of remote sensing data can reduce the amount of ground data to be collected. The procedure of the precision of estimates improvement is achieved by the linear regression correction by using the auxiliary variables determined by classification of

[1]Based on material supplied by Silvia Gaiani.

satellite images. With the help of GIS, the information on the location of crops and other land uses is also meaningful for the exploration of new opportunities of available data.

The reformed livestock survey will use more suitable methods such as multiple frame sampling. The sample of crops survey and livestock survey will be referred to that of rural household survey for data consistency if possible.

To meet the needs of spatialized sampling in rural area and to improve the original sampling method, the National Bureau of Statistics of China has developed research on the Earth sampling method in rural area by integrating remote sensing and statistical sampling technology. Such methodology provides spatial sampling technology support for remote sensing surveys of crop planting area and yield and the contrast between residential sampling and arable land and obtains the interactive validation with the sampling survey technology in existence. Aiming at the major crop (wheat, corn, and paddy) and other related land cover types, the sampling and extrapolating method by remote sensing integrated with statistic sampling technology has been established and the sampling survey counties, villages, parcels have been appropriately distributed with the support of MPPS.

Research on the Earth sampling method in rural area has been done to obtain field samples in 13 main grain production provinces. The sampling unit base mainly contains the spatial information of the Earth sampling units, the natural attributes information, the social attributes information of samples and the update and exchanging management of samples.

Remote sensing

Among the technologies which might be useful in acquiring information, Remote Sensing has special advantages, especially in agricultural statistics. Remote Sensing technology has been successfully applied in a large number of fields since it was initiated some 40 years ago. As a tool to acquire information, Remote Sensing has the advantages of objectivity, efficiency and wide coverage. It allows the enlarging of the statistical coverage, overcomes the influence of the natural environment and saves labour, financial and material resources.

China started work on agricultural remote sensing as early as the beginning of the economic reforms when Chinese scientists began to pay attention to crop yield estimation by using this technology[2]. After many years' development, great progress has been made in using remote sensing in China's agricultural statistics. Many techniques, methods and experiences have been accumulated, ranging from yield estimation of one type of crop to multiple crops yield application, from small districts to multiple provinces and cities. During the Seventh Five-Year Plan, for the first time satellites had been successfully applied to the monitoring and yield estimation of winter wheat by the Chinese Meteorological Department, and the dynamic monitoring and crop yield estimation system for Chinese northern winter wheat had been built up. This

[2]Frolking, S., Xiao, X., Zhuang, Y., Salas, W., and Li, C. (1999) Agricultural Land-Use in China: A Comparison of Area Estimates From Ground-Based Census and Satellite-Borne Remote Sensing. Global Ecology and Biogeography, 8(5): 407-416.

system has been running operationally at the National Meteorological Bureau since 1990, and its application has been extended to paddy, corn and other main crops for operation.

In 1998, the Chinese Academy of Sciences began constructing the China Crop Watch System with Remote Sensing. During the process of running, exploring, and developing, nationwide yield estimation for each type of crop and the total grain yield had been gradually carried on. Since 2000 the monitoring scope has been expanded to the global scale. This system has now been working for an extensive period, involving subsystems such as crop growth monitoring, yield estimation for the main crops, spatial-temporal structure monitoring and a warning system for grain supply-demand balance[3]. The accuracy of this method is largely dependent on the historic base data; uncertainty of the historic data limits the reliability of the monitoring results.

Aiming at the current development of China and the world, the National Bureau of Statistics of China developed the project "**National Statistic Remote Sensing Operational System Key Technology Research and Application**" with the purpose of setting up the national statistical remote sensing information sharing and service platform, promoting the operation of the Chinese statistic remote sensing information system, ameliorating the statistic methodology of the integrated census, sampling survey, statistic report, and spatial information technology application, improving the statistical data quality and service level.

Aiming at the characteristics of crop statistics in China and the prominent problems in current work, the National Statistic Remote Sensing Project carried out surveys and research particularly on crop statistics (such as agricultural production seedling condition survey, crop disaster survey, arable land changing monitoring and survey, crop production trend forecasting, and the area and yield survey for different types of crop), hoping to solve some real difficulties and problems in arable land area statistics, crop planting area and yield statistics.

Alternative technologies to remote sensing: mobile phones for rural statistics and agricultural prices

Mobile and smart phones are other tools that could be used in order to collect, transmit, retrieve and store specific information. They are already being used for instance for the collection of agricultural prices in a wide range of countries and China itself is promoting their use in rural area and their application in rural statistics. In order to collect data (for example about agricultural crop prices), the database design uses simplified codes for the agricultural produce and market operation. The system collects up-to-date market information (via cell phone or computer), feeds them into a database managed on a SMS Server, which is then accessible to request price information for agricultural products via text messaging. The text messages both request and receive price information.

A similar prototype has been tested both for data collection and dissemination of 50 agricultural items in many Asian countries like India, Bangladesh and the Northern part

[3] http://www.cropwatch.com.cn/en/index/html

of China. Market investigators collect up-to-date agricultural commodities prices information from a grower's market on market days and send price information using text messaging over cell phones into a database managed on a SMS Server. Such a system has proved to be extremely useful both for statistical and practical purposes, for farmers' empowerment and for governmental surveys.

A combination of mobile technologies and remote sensing might help to build a new operational platform for rural surveys. ICTs have an enormous potential: they are effective tools for data collection and pervasive policy-making instruments.

FOCUS PIECES

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PART II
AGRICULTURE HOUSEHOLD INCOME, WEALTH AND WELL-BEING

CHAPTER VIII

CONCEPTUAL FRAMEWORK: INTRODUCTION

VIII.1 MATCHING INDICATORS TO POLICY NEEDS IN COUNTRIES AT DIFFERENT LEVELS OF ECONOMIC DEVELOPMENT

Statistics on income, wealth, and other aspects of well-being of agricultural households are the endpoint of an information system. Before the data on which the statistics are based can be collected, there are the crucial stages of "conceptualisation" and "operationalisation". "Conceptualisation" involves developing concepts that are "capable of portraying and reducing the nearly infinite complexity of the real world in a manner that can be grasped by the human mind" (Bonnen, 1975). As concepts cannot be measured directly, "operationalisation" involves defining variables that are as highly correlated as possible with the aspect of reality that is being examined. Bonnen (1975; 1977) has stressed the significance of adequate conceptualisation if the agricultural information system is to perform satisfactorily. Only if this first step is reliable can "operationalisation be undertaken adequately"… "no matter how well one manipulates the numbers, one may still be measuring the wrong thing" (Bonnen, 1975). Furthermore, if this step is skipped there is a danger that existing statistics will be used for convenience when making policy decisions, but in inappropriate ways. The implication is that costly policy mistakes may be made. This concern is by no means a recent phenomenon. As long ago as 1933 there were warnings about using inappropriate indicators (Peterson, 1933) and the debate resurfaced in the 1970s, particularly in the United States (AAEA, 1972). The dangers of using income measures based on inappropriate concepts within the statistics that service agricultural policy,

and in particular the lack of agricultural household statistics in many countries that appear to be more in line conceptually with the aims of their agricultural policy, constituted a potent stimulant for the methodology set out in this Handbook.

"Conceptualisation" is the responsibility of statisticians (who constitute a major part of the "data system") and of members of the "inquiry system", people who are not involved in the routine of actual statistics production and who therefore can contribute a more detached view (for example professional economists, consultants, academics etc.).

Conceptualisation is not easy even in static conditions. In the dynamic economic and technical environment of the 21st Century, the changing nature of agriculture has presented a moving target, opening a gap between the conceptual basis of existing statistics and reality; a situation of "conceptual obsolescence" arises. Such shortcomings in statistics can be more insidious than failure in the "intrinsic" characteristics (inaccuracy because of poor response rates, etc.) because conceptual obsolescence is not readily quantified and because it usually creeps in gradually. The need to generate statistics on a regular basis may divert attention from any widening gap, while the protection of institutional interests and human capital in existing concepts and systems of measurement will tend to lead to the marginalization of any gaps that surface.

Part II of this Handbook represents an attempt to fill an important gap in the existing statistics on agriculture by facilitating the development of statistics on the income, wealth and well-being of agricultural households. Indicators of household well-being in the agricultural sector and in rural areas must be seen in context. A guiding principle in the design of statistical systems of countries, irrespective of their level of economic development, is that indicators should reflect the policy purposes for which they are needed. Writers on statistics typically identify many of the same features of "good" quality, though the terms used may vary (see, for example, Brackstone, 1999; de Vries, 1998; Elvers and Rosen, 1998; Holt and Jones, 1998 and Chapter VI of this Handbook in relation to statistics for rural development). Accuracy, coherence, consistency, continuity, timeliness, accessibility, presentation and comparability over time and space are normally mentioned[1]. All these may be classed as "intrinsic" properties of statistics. "Relevance" is another key characteristic, although this differs in nature from the "intrinsic" characteristics, in that it is dependent on the validity of the link between what decision-makers get and what they need in order to make appropriate policy decisions.

The relevance of indicators of income and wealth for agricultural households comes in large part from the aims of agricultural policy. Though farm operators and their families only represent one component of the population of rural areas, and in many industrialised countries a small and declining one, they are the focus of substantial government interest. In addition, within the public sector, policies on deprivation, economic development, sustainability, trade liberalisation and environmental quality would find such statistics useful if their aims are to be properly serviced and the performance of policy interventions to be assessed. Others groups also needing the information include academics and commercial firms, such as those in the industries upstream and downstream from farming.

[1]This parallels the discussion in Chapter IV of the characteristics of rural indicators required by international organisations.

Among the policies directed at agriculture, two groups are encountered. Firstly, there are the government interventions concerned directly with the well-being of people in the agricultural sector and the efficiency of agriculture production and marketing systems. Some industrialised countries express aims in a generalised way (such as the EU's Common Agricultural Policy objective of ensuring a "fair standard of living for the agricultural community"), some have had explicit targets for the incomes of their farm operators, while yet others are more concerned with creating the economic conditions in which competitive firms can generate a satisfactory income (for a review see Hill, 2000a; for a review of the role of statistics in shaping U.S. agricultural policies see Ahearn, Gardner, and Goodwin, 2007). In less developed economies the emphasis is on the alleviation of poverty, with consumption the focus of statistical attention.

Secondly, there are other policies that have indirect links with the incomes of farmers. Enhanced rewards have been used as a way of encouraging a range of responses from farm operators, such as to expand the supply of farm commodities for reasons of food security or trade enhancement or, more recently in heavily populated industrialised countries, to provide more environmental services. A common result of such incentives has been to increase the personal incomes of farmers, something that makes difficult the removal of the incentives if circumstances change and policy aims shift (Bohman and Ahearn, 2009).

Looking at income and wealth we are concerned primarily with *economic welfare* - those economic causes of utility in the form of goods and services and the command over their consumption that income and wealth provides. Other causes of satisfaction – such as the so-called "psychic income" - should not be ignored. For example, the general lack of success of various publicly funded schemes aimed at encouraging farmers to retire by compensating them for the money income they would forego can be explained in part by their failure to recognise the importance of the loss of non-pecuniary rewards from farming. Furthermore, income and wealth are only partial indicators of well-being. In industrialised countries other factors to consider are the ability to control one's own environment, quality of working conditions, independence etc. and in less developed ones these include the more fundamental issues such as life expectancy, food security and health. Paragraph VIII.4 below will propose a discussion on indicators needed when a broader concept of well-being is taken into account in designing policy.

VIII.1.1 AGRICULTURAL INCOME PROBLEMS

Observation of the documentation, rhetoric and practice of policy suggests that farmers and their households are caught up in income problems that are widespread and characterise the agriculture industry, at least in periods of relative peace in international relations. While these are expressed here in relation primarily to the agricultures of industrialised market economies (this Handbook uses the shorthand term "OECD countries"), there is much in common between countries at all stages of economic development. These income problems are as follows:

- The particularly low incomes in certain regions or sizes of farm that imply an inability to consume at a level society judges to be an acceptable minimum together with associated social isolation and other forms of deprivation (the ***poverty issue***). At the same time the occupiers of other farms may have high incomes, so that the heterogeneity of the income situation presents a problem in

describing the (income) poverty issue in agriculture as a whole and in designing policy to address it. Poverty is of particular relevance in developing countries (again used in this Handbook as a shorthand term covering a range of national circumstances).

- The variations of income experienced by the individual unit (farm household) over time (the ***instability issue***). Again this may vary between region, type and size of farm and will be a more pressing issue among low income farmers, where periods in poverty may result. While incomes from agricultural activity are inherently unstable, the presence of other income may dampen the impact on total household income. Indeed, diversification of income sources may be one way in which farmers cope with anticipated instability in farming rewards.
- The general levels of rewards of those engaged in farming compared with earnings in other sectors (termed the ***parity issue***). This is often expressed in terms of the incomes of people working in agriculture compared with those in other groups in society or the national average. However, for self-employed farmers these incomes are a mix of rewards to labour, capital and land and the issue of parity includes the return to investments in land and capital assets as well as to labour. A major factor in explaining the apparently low reward to land is that its value is determined in a market, typically very small in relation to the total stock, that is often dominated, on the demand side, by existing farmers trying to expand. By spreading fixed costs, a possibility often opened up by technical advances that require larger-scale production, they can reap the benefits of lowering average costs. However, expanding farmers bid up land prices to levels that are determined by their margins over variable costs, not by total costs, and thus land appears very expensive in relation to average profits.
- Partly as a result of this last point, and because in market economies public support of farm incomes tends to be capitalised into higher land prices, income problems are often seen among farm occupiers that are often also owners of substantial amounts of wealth. Wealth is even more unequally distributed than are incomes, and farmers who own land are likely to have a markedly different economic status from those who are tenants or where land rights are poorly defined. It is perhaps worth noting that the wealth of farm households is usually ignored when discussing the need for policy intervention to tackle income problems.

The first three of these points are the same trio of central components of "the farm problem" that have been identified in the United States and summarised by Gardner (1992). The underlying rationale for public intervention lies in the areas of correcting for market failure or of promoting equity.

Parity and poverty are concerned essentially with the welfare of farmers and their dependants. Instability is somewhat different. A low farm income in a single year may not immediately throw the recipients into poverty. Reserves will be drawn on or borrowings made to maintain living standards through times of temporary financial setback. Thus in OECD countries it is **important to distinguish between those farm households that have to contend with occasional periods of low income and those that suffer hardship from incomes that are persistently low**. However, the implications for farm families of sudden falls in income may be far more serious in a

developing country, so the issue of instability is likely to be viewed differently. But, whatever the context, it is clear that to explore the instability issue data are required at the level of the individual farm household over a run of years. Group averages are no reliable indication of the extent of instability at the case level, which can be substantial and which averages mask (Hegrenes *et al.*, 2001; Phimister *et al.*, 2004; LEI, 2007).

Secondary to these three main strands are other issues, some of great importance, which are believed to be related to a significant extent to incomes from farming. Among the most prominent of these are beliefs that incomes of farming households have a substantial impact on the following:

- The **level of general economic activity** and employment in rural areas, especially in those facing unfavourable natural conditions, such as hill and mountain areas, where alternative employment opportunities also tend to be limited. Support for farming in these areas is seen as a way of promoting the viability of the rural economy. In developing countries this line of reasoning is stronger than in many OECD ones where farming now often accounts for only a small part of the economy, even in rural areas.
- The pursuit of practices to **conserve the natural environment**, with the assumption that adequate incomes are a prerequisite for conservation at the farm level. While it might be expected that this income would come from farming, situations can arise in which the ability to undertake environmentally beneficial actions comes from off-farm sources.
- The rate of **technological advance**. Though not an argument heard so loudly in OECD countries in times of agricultural surpluses, the notion that a prosperous agriculture was necessary to encourage the development of new technology and its uptake through rising levels of investment and capital stocks was built into the thinking of post-war agricultural policy in Europe. A prosperous farming sector produced thriving support industries, with more jobs and income arising from exports of modern machinery and chemicals. But again there is evidence that the on-farm investments can be funded by resources earned in other sectors.

With each of these three income-related issues there are alternative ways of bringing about the desired ends other than through changing the incomes of farm operators. There may often be superior ways of stimulating rural employment or of conservation than by using farming and farm operators as vehicles.

In addition, the implementation of policy may produce other situations where reliable income information is important. By no means the least significant of these is to facilitate policy reform. If, as an operational objective resulting from budgetary constraint or international agreements on world trade, it is necessary to change the present pattern of support to agriculture, the reforms will carry implications for the economic situation of people operating agricultural businesses and others working in this industry. To get changes accepted within the political system it may be necessary to consider the provision of compensation for income forgone or to introduce adjustment assistance (such as diversification grants, training schemes, creation of other jobs for farmers and their families etc.). Such policy actions will be performing a role in political economy, in addition to any market failure or equity rationales that may be present.

VIII.1.2 TYPES OF INCOME, WEALTH, AND WELL-BEING STATISTICS NEEDED

To service such aspects of policy mentioned in the previous sections, statistics on agricultural household income, wealth and well-being are required. An example of a more specific guide as to what was needed was provided in the methodology handbook of Eurostat's Income of the Agricultural Household Sector (IAHS) (Eurostat, 1995) which stated that the objective of its sector level statistics for the European Union (EU) was to generate an aggregate income measure, using harmonised methodology, in order to:

- Monitor the year-to-year changes in the total income of agricultural households at aggregate level in Member States.
- Monitor the changing composition of income, especially income from the agricultural holding, from other gainful activities, from property and from welfare transfers.
- Enable comparisons to be made in the development of total incomes of agricultural households per unit (household, household member, consumer unit) with those of other socio-professional groups.
- Enable comparisons to be made between the absolute incomes of farmers and other socio-professional groups, on a per unit basis (Eurostat, 1995)

To this list could be added objectives that relate to the distribution of incomes and wealth that only microeconomic results can furnish:

- Describe the distribution of the above in terms of policy-relevant breakdowns, including by size and type of farm, by region, by socio-economic composition of household, by professional nature of the household, by income and level of wealth and other parameters of the farm and the agricultural household the need for which may become apparent. This could include, for example, households deemed to be operators of commercial farms, of subsistence producers, hobby farmers etc.
- As a subset of the above, to provide information on cases whose low-incomes can be deemed to place them in poverty (the criterion for which may be determined in various ways).
- Provide information on the levels and distributions of the wealth of farm households (assets, liabilities, net worths) and how these relate to the income situation of the same households.

Finally, the list should be completed with objectives related to non-monetary dimensions of well-being to be surveyed at the level of households and persons:

- Gather reliable information and provide a minimum set of standard statistics on well-being in relation to issues including access to labour markets, health care, education attainment, social inclusion, material deprivation, and quality of housing.
- Provide information on the levels and distributions of well-being indicators and how these relate to the income and wealth of the same households, as well as to their rural/urban location.

VIII.2 HOUSEHOLDS AS ECONOMIC, SOCIAL AND CULTURAL UNITS AND AS AGENTS FOR ENVIRONMENTAL CHANGE AND CONSERVATION. CONTROLLERS OF RESOURCES AND USERS OF SERVICES

Whatever the particular policy aim, from the statistical perspective of quality of information, it is important to ensure that statistics on income are linked with the appropriate institutional unit. As the United States AAEA Committee on Economic Statistics stated in 1972:

> *"Only when the basic economic structure of the industry can be described accurately by our data system will analytical accuracy be possible in dealing with the performance and behavioural characteristics that are the focus of most economic analyses"* (AAEA, 1972).

The focus of Part II of this Handbook is agricultural households, in most countries the most numerous type of unit producing agricultural commodities. Their response to economic signals is critical to food supply and to the use of factors of production, including land. Households, however, are more than units of production, which may be combined with other forms of economic activity between which the boundaries are permeable. They are also units of consumption. Offutt (2002) points out that, while taking an overall view of the household when modelling its behaviours has appeal in the setting of farm policy analysis, the agricultural household is a special and complex case because decisions have to be made on how to allocate time and resources among the farm business producing marketable output, off-farm wage labour, and the time devoted to leisure and to all other household activities (e.g. child rearing, hobbies, vacuuming). The household may produce food for its own consumption as well. Moreover, there is a somewhat hazy margin between production and consumption, exemplified by the use of the farm dwelling as both a business and a domestic asset (Singh, Squire and Strauss, 1986; Huffman, 1991).

As noted above, the standard of living of the agricultural community is a matter of central concern within agricultural policy, though precisely which households form this community has rarely been set out explicitly and is thus capable of various interpretations. The standard of living is, essentially, associated with the level of consumption that takes place. The household is a prime unit, and income a key determinant, in the measurement of potential consumption.

Agricultural households are also social units and are important to the cultural identity of rural areas. The "family farm" is a potent if imprecise concept that shapes the direction of much policy aimed at agriculture. Different countries have their own ideas of what comprises a family farm. While family operation and management is a central feature, other criteria such as farm size, the opportunity for family members to work together and continuity of succession may be used. Certainly the desire to pass on a farm business to the next generation is a major aim of a substantial share of farmers, particularly where its size allows it to be a viable business. While the precise nature of the sort of society that policy is intended to promote and preserve is not often clearly articulated, it is clear nevertheless that in many countries there is a belief that

conserving an agriculture structure dominated by household-firms is an effective way of protecting the social fabric. Often this extends to the cultural attributes that are associated with small-scale farming, such as local traditions and languages, especially in the more remote rural regions. Thus there is often political will to support the incomes of farm families as a way of achieving cultural aims. In the EU this forms part of the rationale of rural development policy and the subsidies provided to farmers, especially in disadvantaged areas (mostly hill and mountain regions), with the incomes of farms seen as a key indicator. Many OECD countries also have special legislation in place, especially on taxation, to facilitate inter-generational transfer of land (OECD, 2005).

Agricultural households, through their occupancy of land, and frequently their ownership of it, are also important agents of environmental character and change. As a major category of land user, the management decisions taken by agricultural households can affect the appearance of the countryside, biodiversity and environmental quality. Financial incentives are commonly offered to manage land in particular ways, such as agri-environmental agreements. These will feed through to the income situation of the household, providing a link between its functions as an environmental and an economic unit. There are also strong links between the social and environmental functions, in that major land use changes are often associated with the period when control of the farm passes from one generation to the next.

In developing statistics on agricultural households care has to be taken to acknowledge its complex nature. The notion of a "triple bottom line" may be helpful in this respect – meaning that, when dealing with households, their economic, social and environmental significances must be borne in mind. The income and wealth of farmers and their families certainly have links to all three.

VIII.3 CONCEPTS OF INCOME AND WEALTH AND RELATED INDICATORS

Several indicators of income and of wealth are pertinent to the purposes for which they are needed, outlined in the previous section. The two most obvious income measures are *total income* and *disposable income.* The details of both are considered later (see Chapter X), but they can be introduced here in general terms. **Total income** would be used to describe the composition of the resources flowing towards households from their engagement in agriculture and from a range of other sources, and how these resources differ over time, place and among different groups of agricultural households. Some indicators of total income comprise income in money terms (profits, cash wages, interest received, social benefits etc.) and others include both money income and in kind income (goods and services). In developing countries, in-kind income may be a major portion of total income.

Disposable income bears a more direct relationship with economic welfare as it relates to command in the market over goods and services, what is left over being saved. Certain deductions take place from total income over which the individual or household has no short-term influence. Examples common in OECD countries include income tax and social insurance payments. Only after these have been met is the household able to spend on consumption. Disposable income is thus of particular interest to analysts

concerned with poverty and the distribution of incomes available for consumption and saving. It may be adjusted to take into consideration items that the state often provides in kind, such as education and health care, thereby permitting an improved comparison between countries that differ in the level of public provision of these benefits. Among OECD countries such adjustments tend to move the income indicator towards the measurement of consumption. Consumption captures the use of resources to obtain goods and services, which may differ from the picture emerging from current income due to the imperfect representation of non-market exchanges, savings/borrowings etc. (Jones *et al.*, 2010). It also has the attraction of being, in effect, a composite index that provides a weighted average measure across the different goods and services involved. On this issue, some convergence between OECD and developing countries can be seen. As noted above, among developing countries the focus of statistical attention traditionally has been on consumption measures, though there is an increasing attention to income concepts. The breadth of the income indicator to be used is revisited in Chapter X, where the practicality of making concepts operational is also encountered.

Comparison between farm households and those of other socio-professional groups is an important step in meeting the common policy requirement that farm families should have a standard of living comparable to other groups. This comparison would be expected to be on the basis of disposable income but with the precaution that the different types of income that the groups receive are treated fairly. Examples include the adequate identification and valuation of income in kind that farm households can enjoy by being occupiers of land (such as cheaper food that they produce themselves) and, in the other direction, the extra costs of consumer goods, higher travel costs and reduced availability of goods and services that are (sometimes) faced in rural areas

However, as will become clear in Chapter X the details of both income concepts are by no means straightforward. For example, are the costs of travel to work to be treated as a negative item when calculating disposable income, as without them no earning would take place? Farmers generally avoid this cost but it can be important to people who do not work at home. In addition, the availability of data may be a serious handicap. Thus there may be difficulties in making satisfactory comparisons, particularly between the households of farmers and other socio-professional groups, and between farm households in different countries. Sometimes a trade-off will be required between what is in theory a preferable basis for making comparisons and the practicalities of measurement.

Among the indicators relating to wealth, primacy is usually given to the stock measure of **net worth** (the value of assets less borrowings) of the household. Again, there are many issues of detail and these are discussed in Chapter XII. For example, among the assets, while private property presents some problems of valuation, difficulties extend to other things like pension entitlements. Where farms are partnerships, or where the land is owned by different people from those who own the farm business, the idea of the net worth of a single household may be difficult to establish.

A further major issue, that links (current) incomes and net worth, concerns changes in the real values of assets and liabilities. These can be very important in agriculture. While accumulation of capital can come from savings out of disposable income, and things like gifts and inheritance can play a part, changes in value of assets can also come from (real)

capital gains and losses. Moreover, reductions in the real value of liabilities (in times of inflation) can achieve a similar result. Accounts for income and capital are linked, and it is sometimes a matter of choice whether, for example, a capital gain is included or excluded from the measures of income or whether non-regular items in the resources flowing towards households, such as bequests of money or lottery wins, should be seen as income or as capital transfer. In theory, a measure of **"economic status"** is available that combines income and wealth into a single measure that represents the combined potential command over goods and services, but this has rarely been used in an agricultural context. These issues are explored further later in this Handbook and some practical recommendations are made.

VIII.4 CONCEPTS OF WELL-BEING AND RELATED INDICATORS

A multidimensional vision of well-being

Since the mid-1970s, a number of scholars and studies have challenged the traditional "economistic" approach that generally identifies income and wealth as the essential sources of the attainment of welfare. This stream of critical literature has emphasized the need for introducing additional non-monetary dimensions of well-being, such as social well-being (e.g. housing, education, health and so on), environmental well-being, subjective well-being (e.g. satisfaction, happiness) and others. Accordingly, the well-being associated with income and wealth has been usually redefined as simply economic – or material – well-being. The latter is often also referred as the "standard of living". In the present context we are concerned with the well-being of agricultural households. However, this change also concerns the debate about "development". In the last thirty years the income approach to development has been criticized and revised, and new dimensions and indicators of development have been introduced. Development, in this broader perspective, can be seen as an expansion of human well-being rather than of just personal (or household) income. The choice of indicators to capture the expanded view of development has been covered in Part I of this Handbook (see especially Chapter IV and the national and international case studies of Chapter V and Chapter VI).

But it should be noticed that, notwithstanding the innovations introduced in the discourse and statistics on well-being, most policy-makers and institutions in their daily practice still give prominence to income-related indicators (in developing countries, consumption) for monitoring and assessment of well-being and poverty, and especially for policy design and targeting. This focus on income is also reflected in the greater attention and resources generally dedicated by agencies and statistical offices to the collection of income data and the production of income and wealth statistics, compared to non-monetary well-being data and indicators.

The delay in the practical implementation of the new theoretical framework into a standard set of indicators can be partially explained by some difficulties implicit in the "multi-dimensionality" of the approach. In fact, while measuring and assessing a given single dimension can be done using a single variable (e.g. personal or household income or consumption), multiple dimensions require a set of diverse variables. This multiplicity implies a number of theoretical and statistical problems –especially when

we need to make comparisons over time and/or space– that are not present in the conventional one-dimensional (monetary) approach.

The first problem concerns the choice of the well-being dimensions: which and how many dimensions are relevant and should be considered or privileged. This is called by Amartya Sen the problem of the appropriate "informational base" (Sen, 1999; Chapter III); that is, which information is included or excluded in the evaluation exercise. This selection is very often driven by the availability of statistics, but it has actually deep theoretical implications and strongly affects the results of the evaluation. In fact, each informational basis corresponds to a particular concept of justice or ethics (Sen, 1999; Chapter III).

The second problem concerns the use of the included information. Once the relevant dimensions and indicators have been selected and normalized, we often need to compare them in time and/or space in order to make evaluations. There are at least two alternative ways to make comparisons with multiple indicators: the first is to use "well-being profiles"; the second is to combine the various indicators into a composite index.

A well-being profile shows how the various indicators of well-being vary across dimensions. This approach has some advantages: there is no loss of information and the performance in each single dimension is transparent, allowing for a detailed check-up. However, there is also an important drawback: unless all the values of the indicators are lower or higher for one country (or in one period) compared to the others, the ranking of countries or periods is controversial. Using more formal terms, with a set of single indicators is not generally possible to produce a complete ordering of the observations. Indeed, it is possible to produce only a partial ordering by using stochastic dominance conditions.

The second way to make comparison in time and/or space is to combine the various indicators into a composite index (Nardo *et al.*, 2008). Composite indices have the advantage of allowing for a complete ranking of countries (or periods), because they represent the overall well-being level in one number. Notwithstanding, building composite indices implies loosing a certain amount of information and produces results that are less transparent. Furthermore, composite indices have been criticized because, in a way, they re-introduce uni-dimensionality. (See also the discussion of composite indicators in the context of rural development in Chapter IV).

The choice of the informational base

The multi-dimensional approach to well-being and poverty may be considered a form of progress, but – in addition to the measurement issues mentioned above – this approach can also be confusing. The real issue rests on the selection of indicators, e.g. of the dimensions of well-being that in the previous section has been presented as the choice of the appropriate "informational base". This is not just a statistical problem that can be solved with some smart technique (such as multivariate analysis); it is a theoretical one. If the selection of indicators is made without any sound theoretical foundation, there will be problems of "measurement without theory", as pointed out by Koopmans (1947).

One main theoretical problem when attempting to measure well-being is that very often no distinction is made between "means and ends" (Sen, 1999). Some variables and

indicators – e.g. happiness or self-respect – can be considered as dimensions or components of well-being, while others – such as income or assets – cannot, close scrutiny of their nature showing them to be (possible) means of achieving well-being. In other words, some variables and indicators can measure – directly or indirectly – various dimensions of "well-being achievement" (Sen, 1993), while others are only resources needed to achieve well-being and are not a dimension or a measure of well-being. The former variables are **constitutive** (components) of well-being, while the latter variables are **instrumental** to well-being. There also are some special variables – such as education and health – that have a double nature, as they are both constitutive and instrumental. Putting together constitutive and purely instrumental variables (into composite indices or into factorial analysis or into sets of key indicators) can be confusing and misleading. A similar situation would arise in an analysis of production if inputs were not clearly distinguished from outputs.

Another relevant issue concerns the "**conversion factors**" of resources into well-being: "what use we can respectively make of a given bundle of commodities, or more generally of a given level of income, depends crucially on a number of contingent circumstances, both personal and social" (Sen, 1999, p. 70). Sen identifies at least five distinct categories of conversion factors: personal heterogeneities, environmental diversities, variations in social climate, difference in relational perspectives, and distribution within the family. The mapping between available resources and well-being achievements cannot be considered as objective. As a consequence using a (however large) set of instrumental components of well-being (such as economic entitlements and other observable variables) does not necessarily yield an appropriate ranking according to constitutive ones (such as happiness or self-respect).

Well-being of rural people

Although the issues discussed in previous sections relate to the whole of society, they are particularly relevant in the study of well-being and poverty of households and people in rural areas, of which agricultural households form a subset of particular concern to Part II of this Handbook. The following reasons may be put forward.

A. Most rural disadvantages are strongly related to "conversion factors" that are peculiar to rural areas, such as remoteness, poor infrastructures, lack of public goods and services, scarcity of private services, and insufficient information. All other things being equal, we cannot say that two households, one urban and the other rural, having the same income or wealth enjoy the same well-being, because the latter could suffer from difficulty in accessing a number of social services. Therefore, the rural household could be less socially efficient at converting income into well-being than is the urban household. The same applies if we compare two households living in two rural areas with different infrastructures endowments. These relative disadvantages are acute in developing countries, where rural-urban gaps are huge, but are also important in OECD countries.

B. Some possible components of rural well-being, especially the non-material ones, cannot be caught by income or wealth measurement. For example in rural areas there is likely to be:

   a. more personal security, less criminality and violence. Personal security is a fundamental dimension of human security (UNDP, 1994) and of well-being;

b. a better natural environment and less pollution, that enhance health;

c. more social capital (e.g. quality, intensity and density of community relations), that enhances social cohesion (besides economic development);

d. more food safety and security, enhancing the nutrition and health status of people.

A case could be made that agricultural households are particularly affected by these factors, more so than the other people living in rural areas.

All these factors and components are outside conventional measures of income and wealth. Attempting to adjust incomes of rural people in order to take such factors into account is not seen as the best solution. What is fundamentally required here is a direct multi-dimensional measurement of rural well-being, and an analysis of the contingent circumstances that determine the conversion factors. This would be undoubtedly data-demanding because of the broader informational base that is required. While data about several non-monetary well-being dimensions are already available for many countries, what is often missing is a disaggregation of data between rural and urban areas and between farming households and other socio-professional groups. Nevertheless, the effort needed to produce disaggregated data does not seem overwhelming, given that censuses and surveys could be designed accordingly.

VIII.5 GENDER ISSUES IN AGRICULTURAL HOUSEHOLDS' WELL-BEING[2]

Women's roles in home production and income generating-activities, both farm based and non-farm, differ from men's. Women allocate their work time and manage risk differently than do men for a complex set of reasons. Women also typically have different household responsibilities for consumption decisions. Partly, this is related to the unique child-rearing responsibilities of women, differences in life expectancy, and the result of cultural gender roles and differences in access to agricultural productive resources. In many countries family roles, responsibilities, and rights are gender-related and extend beyond biological differences. The basic decision-making unit in society is a household; therefore, intra-household relationships, such as bargaining power, must be understood to fully understand incentives and behaviour (Haddad, Hoddinott, and Alderman, 1997). For example, in many African societies husbands and wives maintain separate budgets. In addition, understanding the cultural gender roles of children is important to understanding and measuring well-being. For example, in some cultures, girls are restricted from attending school. Agricultural household models provide the conceptual framework to deal with the interrelationships of gender in the household production and consumption decisions (for the classic presentation of this model, see Singh, Squire, and Strauss, 1976).

It is evident from the most basic of indicators that gender plays a role in well-being and a tendency known as the *feminization of food insecurity and poverty* becomes more and more apparent. Research and development experiences have shown the importance of considering the gender of farm and rural people in efforts to understand and influence

[2]Contributed by Mary Ahearn.

their behaviour and well-being through national policies (for example, see Quisumbing, 2003). Information on the unique role played by women in their family and homes is important to understanding and improving the well-being of all rural and agricultural people, regardless of gender.

Gender continues to lack significant visibility in statistics for agriculture and rural areas. The extent of visibility varies by country, making it difficult to generalize. Recent progress has been made for Africa in identifying the gender-related data needs and developing a "toolkit" for in-country data collection (UN, 2005 and 2009). In many countries gender of the principal operator is collected on agricultural censuses and farm surveys, but women may play roles other than principal operator or, for culturally reasons, are not deemed to be the principal operator. In the US demographic characteristics, including gender, are collected for up to three operators on a holding in the annual farm survey (Agricultural and Resource Management Survey) and the Agricultural Census. In 2008, only 11 percent of principal operators in the US were women, but 32 percent of all operators (principal and others) were women (USDA, 2010). Moreover, gender-relevant data extends beyond collection of the gender of the household head or the principal farm operator. In order to understand the barriers to an improved quality of life and design solutions to removing those barriers, it is necessary to collect information on access to productive resources, labour, and credit, especially as they affect the issues of the day, such as food security and climate change. Gender-specific information that can be included in national data collection efforts as proxies for bargaining power include education, shares of family income earned, unearned income, inherited assets, assets at marriage, and the extent of involvement in agricultural labour and management activities.

VIII.6 ACTIVITIES AND INSTITUTIONAL UNITS WITHIN ACCOUNTING AND STATISTICAL SYSTEMS

A distinction central to this Handbook is that between the activity of agricultural production and the institutional units that are responsible for it, of which the agricultural household is the most numerous example in the agricultural industries of many countries (though they often account for a disproportionately smaller share of overall production). This distinction between the activity and the institutional unit is critical to the accounting framework within which income statistics are generated.

VIII.6.1 ACCOUNTING FRAMEWORKS

To be internationally comparable, statistics on the income and wealth of agricultural households not only have to share common concepts; they also have to adopt the same accounting framework by which concepts are operationalised (implemented). Departures from this base are possible for reasons of circumstance, which may be both theoretical and practical, but the framework nevertheless can act as a reference to which these variations may be reconciled by bridges.

Two possible types of accounting framework are encountered that affect many aspects of the methodology encountered in this Handbook – **aggregate accounting** as represented by national accounts, and **microeconomic accounting**, as seen in farm or

household accounts. The alternative approaches are reflected in definitions that, while being similar, differ in matters of detail that are often important to the way the results are interpreted. This is well expressed in a passage relating to income concepts from the report of the Canberra Group of international experts on household income measurement (Canberra Group, 2002 section 2.2.1).

> *"The macro-analyst is interested in the aggregate of household income as it fits into the macro-economy as a whole, and approaches its construction in a top-down manner (…). Exhaustiveness of the definition is also very important to the macro-analyst, as is its consistency with the definitions of income of the other institutional sectors: no theoretical gaps can be left unfilled, even if in practical terms imputations and estimations have to be widely employed when actually compiling the statistics.*
>
> *The micro-analyst on the other hand is primarily interested in the measurement of income distribution. Conceptually, this means that the definitions are driven mainly by what the individual perceives to be an income receipt of direct benefit to him or herself, which results in a bottom-up approach to the construction of a definition. The means of payment is a major discriminatory factor and the rationale behind the payment is subsidiary. Practically, definitions have also to be constrained by what it is feasible to collect in household surveys or what is available at the household level in relevant administrative sources. In fact these two considerations – the conceptual and the practical – will usually result in the same choices, since if individuals perceive a receipt to be of direct benefit to them they are much more likely to be able to provide reliable data on it".*

The UN's System of National Accounts (SNA) is probably the most universally accepted set of international accounting conventions. With roots going back some fifty years, the SNA has formed the basis of much of the economic statistics that already exist for agriculture in countries at all levels of economic development. It has also been the basis of a number of satellite accounts, such as the *System of integrated Environmental and Economic Accounts (SEEA)* with its modified boundaries of what is included within the accounting system, such as the depletion of natural resources (UN, 2000, 2003). The FAO's *System of Economic Accounts for Food and Agriculture* of 1996 (SEAFA 96) was based on the 1993 version of the SNA (SNA93) (UN, 1993). The SNA was updated in 2008 (SNA2008) (UN, 2008), a process that left the general framework intact but which *inter alia* elaborated on issues relevant here, including how households might be grouped, household production, and the informal economy.

The SNA contains guidelines relevant to the development of statistics on households. However, the central focus of the SNA is on national accounting and economic aggregates. For many purposes to do with agricultural policy and rural development the prime concern is with what happens at the level of the individual agricultural household. The concepts and approach of the SNA need modification before they can be applied in the context of microeconomic statistics, though the SNA remains a benchmark. For example, the concept of disposable income viewed at sector level contains items (both positive and negative) that would not be included in household-level studies or would be treated differently. (The definition of income is taken up in detail in Chapter X).

Reconciliation is possible given the information on the definitions used, though the existence of what are apparently different figures may be confusing for the non-expert.

Another example of macro-micro disparity, which is a common feature of official statistics, occurs with the interpretation of what is a household. Some large institutional social units (such as religious communities) are treated in the SNA as being within the households sector, though they would not normally be seen by policymakers as typical targets for agricultural income support, nor are they usually included in household budget surveys.

It should be noted that the SNA93 or SNA2008 do not make recommendations specific to agricultural households and the measurement of their income and wealth. Rather, the SNA gives general recommendations by which the households sector might be broken down into sub-sectors, of which agricultural households could form one. In practice few countries have attempted to do this (Germany and France being exceptions) before Eurostat took an initiative in the late 1980s to encourage a general disaggregation of household sector accounts as a means to develop income statistics for the agricultural household (sub) sector in a manner that automatically generated comparable results for a range of other socio-professional groups (Eurostat, 1995).

The alternative to the SNA as an accounting framework for calculating income is to adopt a microeconomic approach. A major step in developing a methodology for use at household level was the *Final Report and Recommendations* from the Expert Group on Household Income Statistics (the Canberra Group), published in 2001 (Canberra Group, 2001). This group contained representation from the statistical offices of some sixteen countries and many international organisations, including Eurostat, the International Labour Office, the OECD and the World Bank. Experience of existing projects to improve and use household-level statistics were included, notably the Luxembourg Income Study (LIS); this is not an EU project although Eurostat and the OECD are partners in it. The Canberra Group's recommendations acknowledged the SNA93. They are likely to set international standards in the areas to which they apply, and in particular for assessing how the distribution of income is changing over time and, in particular, the issue of poverty.

The issue of sub-sectoring was not tackled by the Canberra Group, though household budget surveys (the main data source for microeconomic work) have commonly grouped households by the occupation of the head of household, as have other microeconomic studies based on tax data. No specific treatment of agricultural households is mentioned, perhaps surprising given the overlap between a main driver of the Canberra Groups' activities (income distribution and poverty) and an enduring central aim of agricultural policy (articulated in the EU as that of ensuring a fair standard of living for the agricultural community). The issue of sub-sectoring is clearly a central one in the development of this Handbook, as this involves determining what is an agricultural household is. So too are the particular problems associated with income and wealth measurement for this group, such as the potential for consumption from own production and the high amounts of capital involved because of the significance of land as an input. Nevertheless the Canberra Group recommendations are highly pertinent to the guidelines of good practice that this Handbook aims to establish.

VIII.6.2 ACCOUNTS FOR ACTIVITIES AND FOR INSTITUTIONAL UNITS

Two main approaches towards accounting for agriculture can be found within the SNA accounting framework:

- Accounts for the **activity of producing commodities** (goods and services) deemed to be agricultural, together with their residual "income" concepts
- Accounts for **institutional units** that engage in agricultural production.

Of course, as these are part of a single system, they relate to each other. Figure VIII.1 illustrates this relationship in an agricultural context. It shows that agricultural activity (represented by the operating surplus arising from this activity, which will be described later) is divided between the various types of institutional units that are involved in entrepreneurial activity.

These fall into three main types:

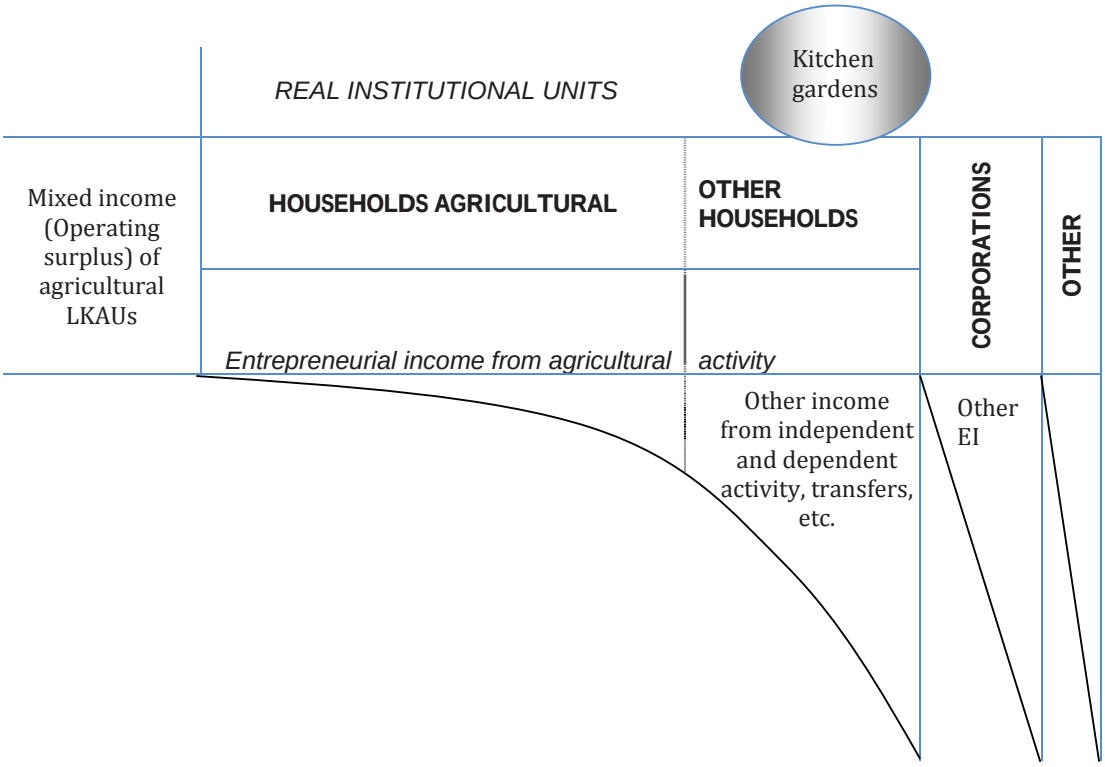
(i) **Households** in their role as units of production (household-firms), and for which agricultural activity is one (possibly the only one) form of independent activity (self-employment) that the household members engage in. The household may also engage in dependent activity (its members working as employees) and may also receive resources in other ways (for example, from welfare transfers, property income, etc.). The independent agricultural activity may account for various shares of the total resources available to the household

(ii) **Corporations,** at least part of whose activity involves agricultural production. (Strictly these are non-financial corporations, as the SNA93 also provides for financial corporations as a separate category)

(iii) **Other types** (including government and Non-Profit Institutions)

This Handbook is primarily concerned with the first of these forms of institutional unit – households. The nature of what constitutes an agricultural household (or an agricultural corporation) is critical to the generation of statistics and can affect both the numbers of households and the income levels and compositions relating to them. The concept of a household (which may take a variety of forms) and the basis used to classify them as agricultural or non-agricultural (for which several possibilities exist) receive detailed attention in Chapter IX.

FIGURE VIII.1
The relationship between agricultural activity and the institutional units that generate it



Source: Hill, B. (2003).

The SNA93 and SNA2008 describe a full sequence of accounts for households as institutional units, including not only current accounts for production but also capital accounts and balance sheets. This sequence is set out in a slightly simplified form in the Focus piece to this chapter (see link below). Though conceived within the framework of national accounts, the sequence can be applied at microeconomic level with some modifications to the coverage of items. When applied to agricultural households, this sequence allows for the calculation of many items that are relevant to agricultural policy, including *inter alia* their:

- Value added from production;
- Operating surplus from production;
- Residual entrepreneurial income from production;
- Income from all sources, including entrepreneurial income; wages, property in its various forms, social transfers etc.;
- Disposable income, after the deduction of non-optional payments (such as direct taxes and social contributions);
- Consumption spending and saving;

- Investment;
- Balance sheets – stocks of assets, liabilities and net worth.

While the complete sequence can, in theory and given adequate data, be drawn up for agricultural households as institutional units, for activity accounts the sequence is strictly only applicable down to the level of operating surplus. To go further in the sequence requires assumptions about the extent to which the institutional unit (household) is mono-active in agriculture and on the separability of consumption activity from that of production. Both of these issues are increasingly subject to question, although such assumptions are often made by the array of indicators commonly in use by policymakers. Dissatisfaction with this situation constitutes a reason to develop indicators that relate to the household as an institutional unit, along with other institutions, which is the aim of this part of the Handbook.

Focus on the Full Sequence of Accounts for Household in the System of National Accounts

VIII.6.3 ACTIVITY ACCOUNTS – AGRICULTURE AS AN ACTIVITY

Before moving to statistics based on accounts for agricultural households and their related methodology it is necessary to describe briefly the activity accounts because these form the basis of most of the current indicators used internationally to monitor the economic situation in agriculture. Such indicators are often assumed to show what is happening to the incomes of farm families, though familiarity with their methodology soon shows why this is inappropriate and potentially misleading.

In OECD countries activity accounts are commonly calculated at both the level of the entire agricultural industry and the level of the individual farm business. In the EU aggregate accounts are drawn up by Eurostat for individual Member States and for the EU as a whole using data provided by national statistical authorities (the Economic Accounts for Agriculture – EAA); the EAA is a satellite of national accounts. At microeconomic level the Commission's Directorate-General for Agriculture and Rural Development coordinates the collection and analysis of farm data through the Farm Accountancy Data Network (FADN, or its French acronym RICA). Other OECD countries generally have similar arrangements. The basic methodologies of both levels were established in the 1930s, though some elements of farm level studies go back even further (Hill, 2000a). Historical precedent is important in explaining the present form of this approach and its dominance hitherto.

Activity accounts at the aggregate level have a major advantage that they can often be built up from national level data without the need to carry out representative surveys of farm accounts. For example, the value of crop output may be estimated from censuses or surveys of crop areas multiplied by average yields and prices. Their results can therefore be produced in a timely and relatively economical way, important features of statistical quality. However, some important drawbacks of (current) activity accounts are that:

- In their traditional form at both industry and farm levels they may relate only to the production of a list of agricultural commodities. The list of what constitutes an agricultural commodity, and therefore agricultural production, is agreed as the

International Standard Industrial Classification of all Economic Activities (ISIC Rev 3) and its EU equivalent, the Classification of Economic Activities in the European Community (NACE Rev 1.1). While this is not highly contentious, there are some difficulties at the margin (such as the appropriate treatment of the growing of Christmas trees as being within or outside agriculture). However, with the broadening of activities undertaken by farmers (such as the provision of agri-tourist accommodation and adding value in food processing) there are increasing problems in separating the value of output into agricultural and non-agricultural. Particularly difficult is the isolation of the inputs used in agricultural production where these are shared, such as the use of a tractor for agricultural production and for forestry or for snow clearing. In the United States, for example, the output accounts include estimates of revenue from services and forestry, such as the hiring out of farm machinery and equipment or the undertaking of custom work for other households or firms. Inclusion of these additional sources of earnings in the estimate of the value of agricultural sector production requires explicit attention to questions focused on these non-crop or livestock production activities in data collection activities. When data are drawn from microeconomic sources, accounts for agricultural production have to be carved out from transactions of real businesses by separating off any non-agricultural activities, something that is increasingly difficult[3].

- In accounts for activities care has to be used in going beyond the calculation of Net Value Added (NVA) or Operating Surplus to achieve an indicator that corresponds to what would be regarded as the profit from farming (for example, Entrepreneurial Income in the EAA or Family Farm Income in FADN/RICA). Interest and rent relate strictly not to activities but to institutional units, in agriculture mostly households and their members. Interest paid will relate to the entire borrowing of a household and will encompass borrowing for consumption and to facilitate production (of all types). This means that careful attention has to be given to estimates of debt that are used in farm activities, including seasonal loans. Some even view the partitioning of interest into agricultural and other purposes as theoretically objectionable (because of the fungible nature of loans) and impractical. Rent paid may suffer from similar problems where there is a degree of combined consumption and production or several forms of production on the same real estate. Labour also presents an issue for measurement since households may pay selected members a wage charged as a labour expense to the farming activity. This wage would be an income to the household. The combined deduction of payments of employee compensation (wages), rents, and interest that relate solely to agricultural production from NVA to arrive at an estimate of an operator's surplus is clearly a challenge to data collection activities. This challenge, in many countries, is made even more difficult by the presence of multiple households on farms (for example a multiple generation farm) and by the increased use of a variety of business arrangements that bring outside entities into a household's farming activities. An example is the production of poultry or pigs under some contractual agreement.
- Particular difficulties arise with the inclusion in accounts for agricultural activity of government payments for non-production. Normally payments are in the

[3]In aggregate activity accounts the basic unit of production is the fictional agricultural Local Kind of Activity Unit (LKAU – equivalent to the *Establishment* in SNA93 terminology).

nature of a commercial transaction, and a flow of goods and services can be identified that correspond with the money flow. While something of this nature could be argued in the case of payments for undertaking production in particular ways that result in a flow of environmental services, there are some financial flows (such as the EU's "Single Farm Payment" introduced by the 2003 reforms to the Common Agricultural Policy) for which there is no obvious corresponding flow of goods and services.

- The "income" concepts of activity accounts are (in essence) factor rewards and do not correspond with the personal incomes of farm operators. These concepts are difficult to interpret by non-specialist users (especially when divided by labour input, which is only one of the contributing factors). In practice such indicators are often used as a proxy for the standard of living of the agricultural community, a purpose for which they are manifestly ill-suited.
- The activity accounts exclude capital gains and losses on most assets (including real estate and liabilities), items that should appear later in the sequence among the capital accounts. By not taking these gains and losses into account, items are omitted that form a component of the longer-term personal rewards of farm operators and that may be important in influencing decisions to stay or leave the industry.
- Capital balance sheets and net worth cannot, strictly, be calculated for the activity of agricultural production (Hill, 2000b). Balance sheets only apply to institutional units, such as households or other bodies with legal status that can enter into contracts, obtain loans etc. It is possible to classify capital assets as agricultural and thus build up a partial picture on that side of the balance sheet. The nature of liabilities means that careful attention must be paid to attempts to develop estimates of debt associated with farming activities. Even if balance sheets can be developed for agriculture, these are open to criticism for their coverage and potential bias at the household level.

Focus on Agricultural Activity Accounts in the European Union

VIII.6.4 ACCOUNTS FOR INSTITUTIONAL UNITS – ACCOUNTS FOR FARM HOUSEHOLD-FIRMS

The essential features of a system of accounts based on institutional units (in the case of agriculture, unincorporated household-firms, with other accounts for corporations etc.) are as follows:

- They are based on complete units, without need to separate off non-agricultural activities
- Complete series of current and capital accounts are possible (dependent on data availability) for households down to disaggregation of disposable income into consumption and saving
- The series potentially extends to capital accounts and balance sheets (equivalent to the net worth of households)
- The accounts cover all flows of resources; for households this includes those from independent activity in agriculture and other industry groupings, dependent

activity (wages), property income, welfare transfers etc. It should be noted that public payments for the supply of (non-marketed) environmental services and compensation for non-production (the latter a particular problem for activity accounts) are accommodated without difficulty in the institution / household unit approach.

- The inclusion of the flows are not dependent on classification by function (e.g. from production of goods and services), though the origins may be used to divide up the total flow
- Sector and income concepts are more easily understood by users, as they apply to real units and do not involve assumptions about the separation off of the agricultural components in outputs and inputs
- Integration of sector and micro levels accounts and indicators is better, as the sector is taken as comprising collections of complete institutional units
- A possibility exists of sub-accounts for selected groups of institutional units, such as
    a) Corporations
    b) Other non-household forms (cooperatives etc.)
    c) Households, with (for example)
        - some agricultural production
        - agricultural production above a given level (which might be that deemed to comprise subsistence production in contrast to hobby gardening, or some other threshold that is deemed to be the lower limit of "serious" or "commercial" or "professional" production, for which holding size might be the criterion).
        - dependency on agriculture (as indicated by the share of agriculture in their total current income), which may be assessed in terms of the entire household or of a reference person, such as the head of household
        - regionally disaggregated, or divided into those that are in rural and in non-rural parts of the country.

Despite these positive attributes, this approach has the drawback that it requires detailed accounting data to be collected at the level of the institutional unit – the household-firm or corporation – something that may be avoided for major elements in aggregate activity accounting. This may be expensive.

In OECD countries, setting up accounting based on complete institutional units may be particularly problematic where farm surveys are the main data source and, as in many EU Member States, these do not currently ask questions that go beyond the agricultural activity. It is feared that farmers might be unwilling to reveal their other economic activities and interests, with possible implications for their cooperation rates in what are usually voluntary surveys. Clearly an adequate explanation by the collecting authority as to why this information is required should be available. This would include the fact that on-farm behaviour (land use, investments etc.) is influenced by the full

range of economic activities and interests of the household-firm, not just those relating to agriculture.

The advantages of accounting and income measurement on the basis of institutional units are not confined to OECD countries. The FAO's 1996 *System of Economic Accounts for Food and Agriculture*, which has general applicability but is directed especially at developing countries, recommends that accounts based on institutional units (in effect, households) is the preferred approach. A major additional reason is that this also corresponds with the way that statistics are built up such countries, which relies heavily on surveys of households.

VIII.7 A DISTRIBUTIVE FRAMEWORK IN DEVELOPING AN ACCOUNTING SYSTEM OF ECONOMIC STATISTICS FOR AGRICULTURE

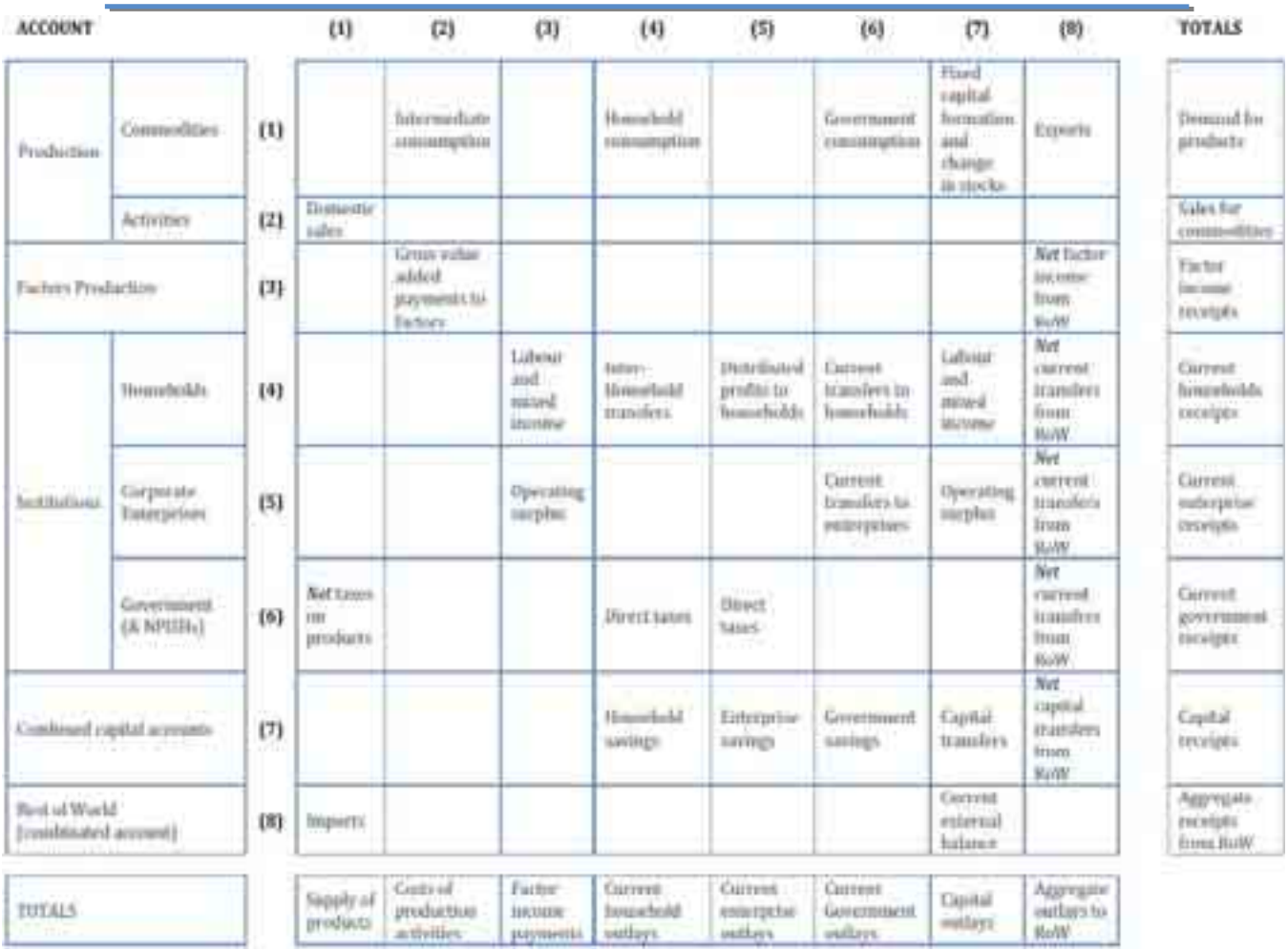
In the previous section a wide range of concepts, issues and problems in accounting for agricultural income and wealth was presented. At this point the Social Accounting Matrix (SAM) approach can be presented as a general accounting framework in developing a system of statistics for agricultural income and wealth[4]. Though the SAM approach has attractive features, which will become evident below, it should be borne in mind that it also has drawbacks in the present context. For example, it does not address the wealth issue (as opposed to the income issue) that is critical in relation to assessing and understanding farm households, nor does it account for the non-market services they provide.

A SAM is a disaggregated, accounting representation of the circular flow within the economy. SAMs have been first proposed as an accountancy framework to integrate input–output tables with a complete representation of the distributive flows in the economy (Stone, 1961; Pyatt and Thorbecke, 1976). The first area of application of the SAM approach was the representation of developing economies for planning purposes (Pyatt and Round, 1985; Round, 2003). Afterwards, the construction of SAMs became a widespread practice both for statistical and analytical purposes. In 1993 the SAM concept was integrated in the System of National Accounts (UN, 1993) as a compact and consistent representation of flows recorded in the full system of accounts.

A summary representation of a basic social accounting matrix is shown in Figure VIII.2.

[4]An extended version of this paragraph, where the SAM approach is considered not only as a statistical framework but also as a basis for modelling, is included in the Second Level of the Handbook: see A General Framework in Modelling Income Distribution: the Social Accounting Matrix (paper from Rocchi, 2010).

FIGURE VIII.2
A basic Social Account Matrix



*) NPISH: Non-profit institutions serving households

Source: Round, 2003: 305

The accounts of the economy are represented in a matrix form. Each row/column combination corresponds to one account: the outlays of the accounts can be read along columns; the receipts along rows. For example, the first row/column correspond to the goods and services account: in the column are displayed the *resources* (domestic production at factor prices and imports) while in the row are displayed the *uses* (intermediate and final consumption, fixed capital formation, export). Given the accounting nature of the figures included in the matrix, in each combination the column and row totals are equal by definition: in the commodity account this condition corresponds to the macroeconomic identity between aggregated demand and supply.

The move towards a **social** accounting matrix proper requires the disaggregation of one or more accounts using some classification criteria. Indeed, the ability of a SAM to represent the backward and forward linkages among the components of the economy strictly depends on the disaggregation of its accounts. The disaggregation highlights the

interdependencies among different parts of the economy supposed to be relevant for theoretical reason. Adopting progressively more detailed classifications of economic units, it is possible in principle to build a continuum of accounting representations of the economy included between the totally aggregated (macro) and the totally disaggregated micro) ones described in paragraph VIII.6.1. In other words, the use of a given classification in disaggregating production activities and/or institutional units results in a "meso-economic" representation in which peculiar structural features of the economy are emphasized.

Usually the economic system in a SAM is subdivided in two ways: a) classifying **production activities** according to some technical criteria (disaggregation by *industry* of the production account); b) classifying **institutional units** according to some socio-economic criteria (disaggregation by *sectors* of the current account for institutions). As a consequence, taking into account also the discussion in paragraph VIII.6.2 above, agriculture may be included in a SAM as a separate industry within a disaggregated production account (production account for all production units carrying out "agricultural" production processes) and/or as a separate sector within a disaggregated account for institutional units (current account of institutional units managing agricultural production activities).

The separate representation of the group of *agricultural households* results from crossing an *industry* with a *sector* classification criterion. Indeed, the inclusion of a household in this specific partition of the institutional *sector* is determined by the degree of their involvement in a specific *industry* (agriculture).

Once a desired level of disaggregation of agriculture has been defined (both on the activity and the institutional side) the appropriate data needed to support a good estimation of figures should be identified. Even when statistical information is produced with only partial or highly specific aims, it should be possible to place it in a consistent way within such an overall representation of the economy.

The SAM framework can suggest a set of general prescriptions with which to comply when developing an internationally agreed system of economic statistics on agriculture. Indeed, the statistical information should be designed **as if the disaggregation of the flows represented in a SAM were to be carried out.** A few general rules for survey design follow from this approach.

First, the completeness of the SAM framework, representing the circular flow within the whole economy, asks for a corresponding completeness in representing the process of *agricultural* income formation and distribution. Information on income accruing to all factors used in agriculture (labour, land and capital) and on all institutional units entitled to earn them is needed. Accordingly, agricultural income should be estimated following a "whole farm" approach and taking into account costs and revenues accruing to the farm as a complete unit. Surveys designed to estimate costs and revenues of single crops and/or livestock productions should be properly integrated.

Such completeness also requires information to ensure that the observed part of agriculture is given its proper position within the representation of the whole economy. Even when only a sub-sector of agriculture is the object of the study (for instance only

farming households), it is preferable that essential information should be available to complete the representation of agriculture *as an industry* (e.g. on corporate farms and other types of institutional unit in addition to households).

Moreover, the observed institutional units have to be properly placed within the *overall* income distribution process. In the case of households, information suitable for assigning them to differentiated socio-economic groups into which the whole sector is divided should be available (such as total income and its composition, household composition, level of education, rural-urban location and so on). Indicators on well-being and/or living conditions could also be a useful tool in disaggregating the households' sector. More generally, the nature of the agricultural households' sector implies that both micro-economic information on farming activity *and* on institutional units is available.

Finally, the SAM approach as a reference framework in designing surveys on agricultural income suggests the adoption of concepts and definitions that comply where practical with international standards. For instance, when data on institutional units are gathered within "industry oriented" surveys, such as surveys on farm structure, the classification of off-farm sources of income should be compatible with those used in surveys such as living standard measurement studies (Grosh and Glewwe, 2000). Conversely, in the case of information on agricultural activities gathered within an "institution oriented" survey, such as family budget surveys, the classification of farming activities and/or the description factor endowments should be compatible with internally-agreed methodology of surveys on agriculture

A General Framework in Modelling Income Distribution: the Social Accounting Matrix

VIII.8 WHERE WE ARE IN THE PROVISION OF INCOME INDICATORS TAKEN FROM INSTITUTION-BASED ACCOUNTS FOR HOUSEHOLD-FIRMS

Activity accounts (current) and related income indicators at aggregate and microeconomic levels are long-established at the EU level and can be found in many other OECD countries. In contrast, accounts and indicators for agricultural households and other forms of institution are far less well-developed. Commentators on agricultural policy (summarised in Hill, 2000a) have concluded that the lack of institution-based accounts is a major gap in statistics needed to assess its performance, a gap that this Handbook intends to help fill. A report by the European Court of Auditors found that the aggregate and microeconomic activity accounts in use in the EU (the EAA and FADN/RICA) "do not provide sufficiently exhaustive information on the disposable incomes of agricultural households and do not allow an assessment of the living standard of the agricultural community to be made" (Court of Auditors, 2003; par. 79). Some possible explanations for the poor availability of statistics based on the agricultural household in the EU are given in a "Focus On" piece, the link to which is given below.

The issue is not that no information on the incomes of farm households is available – though there are some countries, even among OECD countries where very little exists. Rather, the problem is that much of what exists is not of good quality and is not suitable for drawing comparisons. An OECD policy brief puts the situation thus:

> *Most countries have systems in place to monitor the income situation of farm households but they are often incomplete and out of date. There is often a lack of consistency between micro and macro data, between different farm surveys, between farm and general surveys, and between countries. Income concepts and typologies based on commodity production are outdated and no longer relevant given the increasing diversity in income sources and the trend towards the decoupling of policy measures from production* (OECD, 2004b).

The OECD has collated a large number of studies of the income situation of agricultural households, many of which are microeconomic in nature (various reports summarised in OECD, 2002). However, the results contain data that involve a range of definitions. Generalisations of findings and comparisons across countries are hazardous. In particular, the results (both in terms of numbers of cases in the sector and the average level and composition of income) are sensitive to the definition of what constitutes an agricultural household. The need to develop basic recommendations for a methodology is self-evident.

An attempt to provide a consistent methodological framework for agricultural household statistics and comparable results has been made by Eurostat; though conceived to be implemented only in its Member States, it has potential for wider application. Eurostat's initial Income of the Agricultural Households Sector (IAHS) statistics project ran from the early 1990s to 2002, when the series was suspended. A methodology was devised to make sector-level estimates, based in national accounts and incorporating ideas on disaggregation of the households sector taken from France and Germany, but when applied there were rising problems in maintaining the calculation of results because of data availability and concerns over quality (Eurostat, 2002). Nevertheless the development of the methodology tackled a number of issues of definition that have proved valuable when applied in other circumstances and levels of aggregation. Second, a feasibility study of adopting a microeconomic approach has been carried out, adopting a methodology which has elements from the IAHS project and from recommendations contained in the first version of this Handbook, but using data from household and farm level survey and administrative sources (see Hill, 2009 and Chapter XI). But it must be acknowledged that, at the micro-level, there is currently no workable EU system in place for measuring the income of agricultural households on a harmonised basis,

In many countries the main limiting factor in generating statistics on the income and wealth of agricultural households is the availability of suitable basic data. Primary data collection is very expensive and, especially in developing countries, beyond the fiscal reach of national governments. Such data come in three main forms:

- Surveys of farms that take a broad, household approach and collect data on more than just the output and inputs used in the farming process, covering other income and other assets and liabilities. An example of "good practice" is the

United States annual farm business/household survey (the Agricultural Resource Management Survey – ARMS) (National Research Council, 2008), reports of which demonstrate how useful such information can be in revealing the nature of the problems facing agricultural households. Results are posted online (USDA, 2010).

- General surveys of households that cover income and expenditure, that have a sufficient number of cases that turn out to be agricultural households, and where the income data is of sufficient quality. In many OECD countries such surveys are ruled out for one or both of these reasons. In the US they are also not useful because the majority of farm households have a nonfarm major occupation and the occupation of households are identified as the primary occupation.
- Taxation records, where self-employed farmers can be identified as a trade group within the industrial classification. These records may be combined with other administrative records to construct an income statistics register. However, their usefulness is hampered in many countries by farmers not being taxed on their actual incomes but according to some standard – typically dependent on farm area – or by their falling below the tax threshold (OECD, 2005).

In reality, it is found that some countries have several good sources, while others have none. In view of the fundamental importance of the data system to the development of statistics on agricultural household income and wealth, this Handbook provides a detailed country-by-country review of data sources and the income statistics for agricultural households to which they give rise. Chapter XIII contains this material.

Focus On Some Explanations for the Lack of Statistics for Agricultural Households

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Focus on the Full Sequence of Accounts for Households in the System of National Accounts[1]

I) Production account

USES		RESOURCES	
P.2	Intermediate consumption	P.1	Output
		P.11	Market output
		P.12	Output for own final use
B.1g	*Value added gross*		
K.1	Consumption of fixed capital		
B.1n	*Value added net*		

II) Distribution and use of income accounts

II.1) Primary distribution of income account

II.1.1) Generation of income account

USES		RESOURCES	
D.1	Compensation of employees	B.1	Value added
D.11	Wages and salaries		
D.12	Employers social contributions		
D.121	Employers' actual social contributions		
D.29	Employers' imputed social contributions		
D.29	Other taxes on production		
D.39	Other subsidies on production		
B.2	*Operating surplus*		
B.3	*Mixed income*		

[1]From SNA93 Table A.V.6, this presentation being more convenient for the present purpose than SNA2008.

II.2) Allocation of primary income account (which can be subdivided into two)

II.2.1) Entrepreneurial income account

USES		RESOURCES	
D.4	Property income (connected with market activities)	B.2	*Operating surplus*
D.41	Interest	B.3	*Mixed income*
D.45	Rent		
		D.4	Property income (connected with market activities)
		D.41	Interest
		D.42	Distributed income of corporations
		D.421	Dividends
		D.422	Withdrawals from income of quasi-corporations
		D.44	Property income attributed to insurance policyholders
B.4	*Entrepreneurial income*		

II.2.2) Allocation of other primary income account

USES		RESOURCES	
D.4	Property income (not connected with market activities)	B.4	*Entrepreneurial income*
D.41	Interest		
D.42	Rent	D.1	Compensation of employees
		D.11	Wages and salaries
		D.12	Employers' social contributions
		D.121	Employers' actual social contributions
		D.122	Employers' imputed social contributions
		D.4	Property income (not connected with market activities)
		D.41	Interest
		D.42	Distributed income of corporations
		D.421	Dividends
		D.422	Withdrawals from income of quasi-corporations
		D.43	Reinvested earnings on direct foreign investments
		D.44	Property income attributed to insurance policyholders
		D.45	Rent
B.5	*Balance of primary income*		

II.3) Secondary distribution of income account (simplified)

USES		RESOURCES	
D5	Current taxes on income, wealth etc.	B.5	*Balance of primary income*
D.61	Social contributions	D.61	Social contributions
D.611	Actual social contributions		
D.612	Imputed social contributions		
D.62	Social benefits other than social transfers in kind	D.62	Social benefits other than social transfers in kind
D.7	Other current transfers	D.7	Other current transfers
D.71	Net non-life insurance premiums	D.72	Non-life insurance claims
D.75	Miscellaneous current transfers	D.75	Miscellaneous current transfers
B.6	*Disposable income*		

II.4) Redistribution of income in kind account

USES		RESOURCES	
		B.6	*Disposable income*
		D.63	Social transfers in kind
		D.631	Social benefits in kind
		D.6311	Social security benefits, reimbursements
		D.6312	Other social security benefits in kind
		D.6313	Social assistance benefits in kind
		D.632	Transfers of individual non-market goods and services
B.7	*Adjusted disposable income*		

II.5) Use of income account

II.5.1) Use of disposable income account

USES		RESOURCES	
P.3	Final consumption expenditure	B.6	*Disposable income*
P.31	Individual consumption expenditure		
		D.8	Adjustment for the change in net equity of households on pension funds
B.8	*Saving*		

II.5.2) Use of adjusted disposable income account

USES		RESOURCES	
P.3	Actual final consumption	B.6	*Adjusted disposable income*
P.31	Actual individual consumption		
		D.8	Adjustment for the change in net equity of households on pension funds
B.8	*Saving*		

III) Accumulation accounts

III.1) Capital account (simplified)

CHANGES IN ASSETS NET WORTH		CHANGES IN LIABILITIES AND NET	
P.51	Gross fixed capital formation	B.8n	*Saving, net*
K.1	Consumption of fixed capital	D.9	Capital transfers, receivable
		D.92	Investment grants
P.52	Changes in inventories	D.99	Other capital transfers
P.53	Acquisitions less disposals of valuables		
		D.9	Capital transfers, payable
K.2	Acquisitions less disposable of non-produced non-financial assets (land etc.)	D.91	Capital taxes, payable
		D.99	Other capital transfers, payable
B.9	*Net lending / borrowing*	B.10.1	*Changes in net worth due to saving and capital transfers (Total of the above)*

The other accounts (not detailed here) are as follows:

III.2) Financial account

III.3) Other changes in assets accounts

III.3.1) Other changes in volume of assets account
III.3.2) Revaluation account

III.3.2.1) Neutral holding gains/losses account
III.3.2.2) Real holding gains/losses account

IV) Balance sheets

IV.1) Opening balance sheet

IV.2) Changes in balance sheet (within which the change in net worth is attributed to savings and capital transfers, other changes in volume of assets, and nominal holding gains/losses)

IV.3) Closing balance sheet

Focus on agricultural activity accounts in the European Union

The EU publishes aggregate (industry-level) agricultural activity accounts (the Economic Accounts for Agriculture – EAA) for the EU using data provided by the individual Member States. Eurostat has established an agreed methodology (Eurostat, 1997 and updates) and harmonised results are published annually for the EU and for individual countries. Though based in National Accounts methodology (SNA93), the EAA depart in a number of ways to put them more in line with the perceived needs of policymakers in terms of the coverage of commodities (small adjustments are made, for example, to include Christmas trees, the production of which would otherwise be classed as forestry) and units of production (in effect, output from hobby gardening is no longer included). Since the revised version of the methodology was introduced (EAA97) to be compatible with the revised SNA93 (and its European manifestation, the ESA95), the nature of these departures has been made transparent, with a bridge table provided in the methodology (though not always actually calculated) between the ESA and the SNA. Many individual governments apply this EAA97 methodology (sometimes with small variations) in the creation of accounts and indicators for national purposes.

The industry-level activity accounts are complemented by accounting systems at the microeconomic level (farm or holding). Again, many industrialised countries carry out surveys of the accounts of individual farm businesses, including the income generated from production, to inform policymaking. In the EU, the survey is known as the Farm Accountancy Data Network (FADN, or the French acronym RICA) and is made up of national surveys that supply data to the European Commission which acts as a coordinating and regulating agent. Again, the methodology is agreed by Member States and thus the results are harmonised and comparable (European Commission, 1989 and updates). Farm level data are needed to study issues such as distribution of rewards, of productivity, of stability etc.

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Focus on Some Explanations for the Lack of Statistics for Agricultural Households in the OECD Countries[1]

Given that indicators relating to the income situation of agricultural households are generally seen now as being of importance, how is it that they have received so little attention from statisticians in the past? Why in those relatively few countries, including the United States, where data have existed for a considerable time, has information on the income and wealth position of farmers as a group not made the substantial impact on domestic policy that might be expected, especially when their situations are good compared with other groups in society? In the EU (and in many individual OECD countries) there seems to be a number of explanatory factors:

- *Lack of political demand.* Politicians have not requested this information, perhaps because of a too-simple perception of the agricultural industry, or a fear of the electoral consequences of drawing attention to it.
- *Historical precedent*. Activity accounts, at both aggregate and farm levels, and their related "income" indicators are long-established, having been set up when there were stronger grounds for assuming that the only source of incomes of farm households was from farming. In the EU, the EAA adopted the "Branch" concept at its outset in 1964; as did the FADN basic legislation of 1965.
- *Operational requirement.* The fact is that agricultural policy (including the EU's CAP) has operated apparently successfully for many years in many countries without information on the incomes of agricultural households. The administration of income support systems has rarely if ever required the data (though some tests of eligibility have been applied within individual structural schemes).
- *"Rational ignorance" among many users*. There is a tendency among users, especially non-specialists, to adopt satisfying behaviour. That is, they take the first available indicator that appears to meet their needs, so that measure of the income from agricultural activity may be assumed to show the income of farmers. Among some users there may be a suspicion that the information revealed by household-firm data could be against their political and/or bureaucratic interests.
- *Self-interest of bureaucracies.* Government departments for agriculture have often taken a pro-farmer stance and might therefore not wish to draw attention to anything that might lead to a reduction in support for the industry, as might be revealed by statistics on household income. There is also an understandable aim of wishing to maintain continuity with long-established systems of activity accounting.
- *Data availability.* Lack of basic data of suitable quality in some countries is a major constraint in the development of statistics on the complete activities of farm businesses and their households. In countries where it has not been conventional to ask questions on non-farm income, agencies that collect data have been reluctant to ask new questions about non-farm income for fear of harming response rates.

[1]Material provided by Berkeley Hill, 2000.

FOCUS PIECES

Hill, B. (2000). *Farm Incomes, Wealth and Agricultural Policy*. 3rd ed. Ashgate Publishing, Aldershot. ISBN 0-7546-1132-9.

CHAPTER IX

THE AGRICULTURAL HOUSEHOLD CONCEPTS AND DEFINITIONS

The household, rather than the individual, is commonly adopted as the basic unit of analysis when considering the economic situation of society (though data for individuals may be collected separately). The household is recommended by the Canberra Group of experts for use in studying income distributions and is the basic unit in household budget surveys, the main purpose of which is to assist in the creation of retail price indices (cost of living indices)(Canberra Group, 2001). In an agricultural context, it was adopted by the FAO as the foundation for its System of Economic Accounts for Food and Agriculture (SEAFA), intended for use by countries at all levels of economic development (FAO, 1996). In the United States, incomes for farm occupier households are calculated by the United States Department of Agriculture's Agriculture Resources Management Survey (ARMS) (the forerunner of which was the Farm Costs and Returns Survey).

IX.1 CONCEPTUAL ISSUES REGARDING THE PREFERENCE FOR THE HOUSEHOLD UNIT

A feature of agricultural incomes is that they are usually only meaningfully defined at the household level because, typically, they comprise rewards that are earned, at least in part, by members working as self-employed labour on the farm operated by the household. Before moving to a definition of the agricultural household appropriate to the generation of statistics it is necessary to explore briefly the relationship between the household and the individuals of which it is constituted, something that bears on the validity of measuring income at the household level and, by extension, the usefulness of the resulting statistics.

Though this Handbook adopts the household as the basic unit to which its income statistics relate, for some purposes it is important to know more about the economic situation of the individuals. For example, a fundamental welfare question involves knowing how much money is needed to make **each household member** as well off as they were before a change in living conditions. Compensations should be defined on the basis of individual rather than household welfare, and corresponds to individual welfare after the redistribution of both monetary and non-monetary resources has taken place within the family.

In general, income surveys record incomes measured at the level of the individual. Such income data are most readily collected when household members are employed by a third-party institutional unit and provide their time to their employer at an objective market wage. Clearly, most agricultural labour is not of this form, at least as far as its engagement in farming activity is concerned. The derivation of the incomes of individuals within farm households presents challenges because of the nature of the family operation of the farm business. Reconstructing the incomes of household members and consequently revealing associated individual welfare requires knowledge of individual utilities that are only derivable from the identification of the rules governing the intra-household allocation of resources.

Asking how household endowments of both goods and time are allocated within the household is an interesting behavioural question. It is also a crucial welfare issue, since measures of poverty and inequality, based on the assumption of equal treatment of family members, may grossly underestimate reality. Some members of the household may be relatively more or less poor depending on the allocation rule. In terms of policy implementation, knowledge of how resources are shared within the household may be relevant, for example, to the devising of eligibility rules for benefit schemes or to ranking households in terms of the equality of the intra-household distribution process. The definition of the Consumer Unit (discussed later, as a way of bringing households of different sizes to a common base) is founded on the notion of including all individuals pooling a given total income. According to Seneca and Taussig (1971), determining the income unit is the most intractable problem that must be resolved in estimating equivalence scales appropriate for tax policies.

Models of household behaviour can only take us so far. According to Ellis (1993), theories such as the profit-maximising peasant (based on neo-classical theory); the risk-averse peasant; the drudgery-averse peasant (Chayanov and Nakajima models); and the farm household peasant (Barnum-Squire and Low models) have two common assumptions, namely that the household acts as one decision-making entity, and that its objective is to maximise something, whether profit or utility. In other words these theories **assume that the household has a single utility function** and that the utility of each individual household member is integrated into this single function. This assumption poses a number of problems. Traditional models describing household decisions in a unitary fashion are inadequate to properly describe the intra-household decision process.

On the other hand, the collective models of household behaviour which try to take account of the objectives and behaviour of individual members of the household by relaxing the assumption that the household acts as one decision-making entity enable a

discussion of intra-household relations and gender issues to take place. The collective representation of family behaviour (Chiappori, 1992), where each family member is characterized by a utility function and decisions are assumed to be Pareto efficient outcomes, is appropriate since it makes the intra-household decision process endogenous. Chiappori's "collective approach" permits the estimation of individual incomes and the associated utility levels of individual household members. In welfare terms it would be possible to determine how much money is needed to make each household member, be it an adult or a child, as well off as they were before the change. It would then be appropriate to refer to inter-personal rather than inter-household comparisons. Further, the knowledge of the welfare levels of individual household members makes it possible to account for gender and inter-generational differences in the evaluation of policy impacts. Ultimately, it would be possible to answer fundamental questions such as whether it is better to be a poor child in a rich household or a rich child in a poor household.

Income statistics are usually computed without using knowledge about the intra-household allocation of goods and power and without giving special consideration to the fact that goods that are private at the aggregate household level are public within the household (Gronau, 1988 and 1997). This knowledge, though deducible (Deaton, 1988; Gronau, 1988; Chiappori, 1992), is usually constrained by the fact that only information at the household level is available in expenditure surveys. The neglect of intra-household inequality may have consequences for the measurement of society's level of poverty and inequality (Haddad and Kanbur, 1990), or it may generate paradoxical results of the type reported by Glewwe (1991) according to which transfers from the poor to the rich could decrease inequality.

In this regard, Sen (1983) points out that "A much more articulate family welfare function is needed to relate the collection of unequaled levels of well-being of family members to an aggregate measure for the family as a whole. This will, of course, involve a "mini social choice problem..." The approach of "equivalence scales" "…has to be integrated more fully with intra-family allocation and theories of aggregation of unequal well-beings". Gronau (1997) reinforces this point by asserting that "(...) the effect of children on consumption patterns depends on the intra-household redistribution of resources and consumption technology, and that in discussing 'children-welfare indices' (which adult equivalence scales presume to be) one has to ask: whose welfare do we have in mind?"

In general, households living in poverty typically have a single income earner. These households often live in disadvantaged areas where job opportunities are scarce, especially for low skill workers. The degree of dependency of the household upon the resources brought home by the primary breadwinner, generally a male, varies with the life cycle of the family and across social strata. In these households, the dependency upon the income received by the single worker implies that the welfare of the members depends upon the man's allocation rule of his earnings among personal expenses and expenses for the care of the dependent members of the household and the housekeeping budget, generally handled by his wife. This is not always either a smooth or a fair division.

Because the distribution patterns of income within the family is an informal matter that has not been adequately studied, it is difficult to know which pattern of allocation prevails across the households of different societies. According to Seccombe (1993), three broad variants may be distinguished: 1) altruistic, 2) fair, and 3) egoistic and despotic. In the altruistic model, men hand the salary in its entirety to their wives while keeping a modest amount for personal needs at their spouses' discretion or by mutual agreement. Within the fair model, probably the dominant pattern, the working men hand over a housekeeping allowance, colloquially known as the wife's 'wage.' In poor households, in a relative sense, when the allowance barely covered the regular weekly expenses of food and rent, it was almost impossible to set aside funds for children's boots, new clothes or unexpected medical bills. In the egoistic and despotic variant, extremely pernicious but not uncommon, the cash wives obtained was a random residual corresponding to the amount left over after their callous husbands had satisfied their wants: visiting the pub or betting shop. Working men who 'drank their pay' caused serious negative externalities to the other members of the household.

To conclude, **assessment of incomes at the level of the household is more meaningful in representing the potential command over goods and services than would be the case if the incomes of the individual members were treated separately**. This applies particularly to the households that operate farms, where self-employment is a feature. This is not to deny that, when it comes to making decisions, there can be a variety of styles, some households doing it collectively (implying a single set of preferences and the "glued-together" family model envisaged by Sen [1983]) and others where a single person decides ("despotic" families), though this may vary with types of expenditure (pocket money of individuals not being normally subject to detailed approval by other household members). Nor does it assume that all funds are shared. For example, farmer's wives may have some source of income which they regard as their own (such as from providing bed-and-breakfast accommodation in the farmhouse). But spouses when asked commonly report that their individual earnings go to increase the overall household income.

While in general it clearly makes sense to take the household as a convenient unit for income analysis, in some circumstances it is necessary to have data on individuals or other units. In some developing countries larger social units may be appropriate.

Statistical Units for Income Surveys (Boncinelli, 2010)

Moving from the conceptual consideration of households to the operational definitions necessary to enable statistics on the incomes of agricultural households to be generated requires clear and practical definitions. A detailed consideration of what constitutes an agricultural household can be broken down into two elements:

- The definition of a household;
- The characteristics that distinguish an agricultural household from any other.

Both "household" and "agricultural household" (or "farm household") are familiar terms. However, behind this common usage lie various meanings that must be clarified and used with discrimination when generating statistics. Some of the general issues were introduced in Chapter VIII. Here the intention is to review the details.

IX.2 DEFINITION OF THE HOUSEHOLD APPROPRIATE TO ACCOUNTING AND STATISTICS

The starting point for the definition of a household is the System of National Accounts in its form of 1993 (SNA93) and in its 2008 update (SNA2008) (UN, 1993 and 2008). In terms of definition the two are virtually identical. In the updated (2008) version the definition appears as follows:

> *For the purpose of the System, a household is defined as a group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food. In general each member of a household should have some claim upon the collective resources of the household. At least some decisions affecting consumption or other economic activities much be taken for the household as a whole (SNA 2008, para 4.149).*

The SNA 2008 makes it clear that members of a household do not necessarily have to be part of the same family (para 4.150). Furthermore, households can take a variety of forms, reflecting local social conditions (history, religion, culture etc.) while satisfying the central principle of sharing some resources and consumption. Consequently the SNA recognises that, for surveys, statisticians may add more precise, or operational, criteria within a country. It should be noted that the European manifestation of the SNA (the European System of Accounts 1995, based on SNA93) in its definition mentioned family links *("The criteria of the existence of family or emotional ties may be added")* (Eurostat, 1996).

The predominant view of households in the SNA (and ESA95) is that they are units of consumption whose main resources come from wages (compensation of employees), property income or transfers. However, it is clear that households can also have a production activity, something that is of particular importance when considering agricultural households. Indeed, SNA2008 specifically mentions 'unincorporated enterprises within households' (paras 4.155 to 4.157) who produce goods and services for sale on the market or for barter, that these arrangements can take various forms (single persons, partnerships etc.), and that some of the enterprises can be large and have many employees.

The ESA provides a useful description what comprises the households sector for national accounts purposes (ESA 2.76):

- Individuals or groups of individuals whose principal function is consumption.
- Persons living permanently in institutions who have little or no autonomy of action or decision in economic matters (e.g. members of religious orders living in monasteries, long-term patients in hospitals, prisoners serving long sentences, old persons living permanently in retirement homes). Such people are treated as comprising, together, a single institutional unit, that is, a single household.
- Individuals or groups of individuals whose principal function is consumption and that produce goods and non-financial services for exclusively own final use; only two categories of services produced for own final consumption are included

within the system: services of owner-occupied dwellings and domestic services provided by paid employees;

- Sole proprietorships and partnerships without independent legal status - other than those treated as quasi- corporations - which are market producers;
- Non-profit institutions serving households, which do not have independent legal status or those which do but are of only minor importance (see ESA 2.88).

Hence the SNA/ESA definition of the households sector includes not only private households but also some units which do not form part of the coverage of household budget surveys. Examples include both communal living units (hostels and monasteries) and other institutions such as universities. However, these units are unlikely to correspond with the notion of the target group for agricultural policy and are probably better omitted from statistics on agricultural households. In any event, where households are selected for special study that are mainly dependent on agriculture for their incomes, such non-family forms are unlikely to be included.

As noted above, the SNA definition encompasses both the consumption and production activities of households. However, its national accounts approach may not be universally appropriate. An alternative is a microeconomic approach, and it is this that forms the base of much international work on poverty and income distributions. Finally, the two alternatives can be combined in a micro-macro approach (Ciaccia at al., 2009).

For insights into this type of definition it is instructive to turn to household budget surveys. In OECD countries the official definitions of a household that exist for use in the separate national household budget surveys are broadly similar but differ in detail. In the definitions adopted by EU Member States the condition of living at the same address and sharing catering arrangements is common, though differences occur in the way that live-in domestic staff and temporary residents, such as students, are treated. However, such differences are peripheral to the main thrust of the definition of the household for the purpose of income studies.

Of far greater import is the role played by **adult family members, additional to the farmer and spouse, who may live in the farm dwelling** - usually grown-up children, parents, brothers and sisters. These multi-generational and extended households are thought to be a particular feature of the social structure of agriculture, even in many OECD countries. While there would be little dispute over treating a cohabiting couple with dependent children as a single household unit for the purpose of income assessment, there are problems if other adults also live in the same dwelling. Things are made complex because of the fact that many farms are run by family members working together and many different forms of financial arrangements, formal or informal, may exist between them. For example, family labour working on the farm may be unpaid, paid as hired workers, or be self-employed business partners. Where grown-up children receive a wage, though they may make some payment to the farm household for their keep, they probably regard their independently-earned income to be under their own control as far as spending is concerned. The case for *not* including these additional adults in the household unit is particularly strong where they have full-time jobs off the farm and are treated within national tax systems as separate units. To include them in the larger household unit of measurement, when they are clearly financially

independent, introduces a degree of artificiality that can undermine the validity of the income statistics. However, even if such grown-up children do not contribute labour to the farm on a regular basis, it seems highly unlikely that they would not help out at seasonal labour peaks; to some extent they still form part of the agricultural labour force. Much the same problem is faced when retired parents live with their farmer-children or when other groups of relatives live in the same house. The notion of personal income implies the freedom to dispose at will, and it is far from certain that, for example, the old-age pension of a retired relative living in the same residence can be regarded as at the general disposal of the household.

Focus on the Definitions of Household in the United Kingdom

Consequently, when designing statistics on the income situation of agricultural households, a distinction should be drawn between the household as a social unit for domestic budgeting and consumption (the housekeeping unit, or **single budget household**, comprising only those people who pool income and expenditure) and the household unit in the domiciliary sense (the **accommodation or dwelling household**, consisting of the people living under the same roof). Of course, any one farm may have more than one household associated with it; this applies whichever approach is taken.

In the absence of firm information on intra-household financial integration and the diverse forms it takes, a case exists for calculating household incomes using both concepts. This would imply data collection for all people living in the same dwelling, but only including the incomes of some of them when using the *single budget household* concept. Some balance could then be struck between the overstating of income at the disposal of the household incurred by including the income of additional adults and the understatement which would doubtless result from their being excluded. What is appropriate treatment for one country may not apply elsewhere because of differences in degrees of financial integration that will reflect, *inter alia*, social norms and systems of direct taxation. However, the boundaries of the *single budget household* are not simple to define. In reality, family budget surveys differ in their approaches, but usually conform to dwelling household (Eurostat, 1993). In contrast, taxation statistics that use the *fiscal household* approximate to the *single budget household* (though the move to independent taxation of individuals in some countries, including the United Kingdom, has eroded this).

The Canberra Group (2001) approached the definition of a household from a microeconomic standpoint. The Group's formulation of the several tiers of units involving household statistics are set out in Box IX.1. Its recommendation is that the household (as shown in this figure) is adopted as the basic statistical unit for income distribution analysis, with other units taken as alternatives for particular purposes. The Group's preference for the household (dwelling concept) is a reflection of the importance of household budget surveys as a main data source and of its particular interests – income distribution statistics. The present context (in which the comparative position of agricultural households in relation to other socio-professional groups, particularly to other households that have a role in production activities is of concern) might constitute one of the "particular purposes" postulated by the Canberra Group.

In the absence of an internationally applied definition of a household, Eurostat (1993) recommended that, for its Income of the Agricultural Households Sector (IAHS) statistics, the definition of a household should accord with that used in national household budget surveys. This will normally be based on the single-dwelling concept. However, a consensus is building that, for the purpose of constructing income statistics for agricultural households, the narrower single (housekeeping) budget concept is preferable for both theoretical and practical reasons. This Handbook therefore recognizes the *single budget* household concept as the preferred household measure. But it is equally clear that, for comparisons to be drawn with other socio-professional groups, an equivalent treatment must apply there too. If this is not possible, the single dwelling household may have to be used.

BOX IX.1
Canberra Group recommendations for harmonised statistical units

Dwelling
A structurally separate set of living premises with a private entrance from outside the building or from a common hallway or stairway inside. Eurostat definition is: a structurally separate set of living premises and the principal usual residence of at least one person.

Household (dwelling concept)
A person or group of people who reside together in the same dwelling.
This is virtually identical to the Eurostat definition of a private household -household dwelling concept.

Family (housekeeping concept)
Two or more people sharing a common dwelling unit and related by blood, marriage (including same sex couples and de facto or Common Law relationships) or adoption. The proposal here is that all relatives living together at the time of the data collection should be considered to comprise a single family regardless of the nature of kinship. This is virtually identical to the Eurostat definition of a private household – housekeeping concept.

Unattached Individuals
An unattached individual is a person living alone or in a household where he/she is not related to other household members.

Income Units
One person or group of related persons, within a household, whose command over income is shared.

Source: Adapted from Table 3.1 of the Canberra Group (2001).

The variation in norms seen in OECD countries poses a problem in establishing methodologies capable of generating internationally comparable results. When the spectrum of countries is extended to **developing countries**, problems of this sort multiply considerably. In these contexts the household, as envisaged in OECD countries, may be irrelevant for statistical purposes or in explaining behaviour. It must be remembered that solutions to methodological problems should be sought that are appropriate to local social norms, such as the use of community instead of household,

remembering that what is suitable for, say, sub-Saharan countries may not apply elsewhere.

The conditions in developing countries are reflected in the UN guidelines for population and housing censuses, taken over into the draft methodological recommendations for the World Programme of Agricultural Censuses scheduled for 2010. These describe a household as follows:

> *"The concept of household is based on the arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living. A household may be either (a) a one-person household, that is to say, a person who makes provision for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household, or (b) a multi-person household, that is to say, a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their incomes and may, to a greater or lesser extent, have a common budget; they may be related or unrelated persons or constitute a combination of persons both related and unrelated".* (UN, 2007).

The guidelines stress the criterion of household members sharing the means for living, and do not mention the need to live at the same address (that is, in the same dwelling). They point out that when viewed in this way, households may occupy the whole of a housing unit (dwelling), part of one or several units. There may be more than one household living in a housing unit. Some households consist of extended families making common provision for food and may occupy more than one housing unit. In other cases, different family units live in separate housing units, but have a common head, such as in polygamous unions. A "family" is more readily understood than a "household", but it is not the same thing; a family may include people living in other households in other places. Focus Box IX.1 in the following focus material illustrates difficulties in using the household as the unit of analysis in developing countries.

Focus on Households in Developing Countries

This handbook recognizes that a flexible but transparent approach should be taken to the definition of a household. While income measurement on the basis of the complete *dwelling household* should be undertaken to facilitate comparisons, both internationally and with national data sources, data should also be available to allow the application of the concept of the *single budget household* which in some circumstances may be preferable. Appropriate adjustments should be applied for developing countries cases.

IX.3 HOUSEHOLDS OF DIFFERENT SIZES AND COMPOSITIONS

Households differ in size and composition. A given level of income for a large family may represent a much lower standard of living per member than for a smaller family. In particular, comparing the income level and distribution in this income between, say, households headed by active farmers with the all-households average is likely to be misleading, as the latter will reflect the large numbers of low income single-person households, mainly containing elderly individuals, that typify many industrialised countries. Simply dividing income by the number of individuals in the household may not be satisfactory, as the requirements of child household members are likely to be different from those of adults. Basing the analysis of incomes on particular sizes of household (for example, comparing the incomes of households of two adults and two children across socio-professional groups) is likely to be to restricting in terms of numbers of cases. Some **equivalence scale** needs to be applied which puts incomes on a common base. This is a recommendation of the Canberra Group (for a review of approaches see Hagenaars and Van Praag, 1985). It is preferable that different coefficients be applied at different levels of income, though this is not usually done. The choice of scales and equivalence figures will reflect differences in social conditions, and these are likely to change over time.

Hill (2000) reports that in the US, though the scales used were otherwise similar to the British coefficients, the figure applied for late teenagers was substantially higher. This suggests that American families at the time may have been required to support their near-adults more than in the UK. It is likely that the coefficients that should apply to agricultural households will differ from those for other socio-professional groups, reflecting the particular social conditions found there, including the unusually large households found in some countries. This point is related to, but separate from, the issue of the proper measurement of household income where opportunities for the consumption of own production are offered, as in farming. However, it appears that whatever equivalence scales are adopted, arbitrary judgements are inevitable. In this case, countries should report the equivalence scale used to facilitate comparisons.

It is obvious that the use of equivalence scales is made less critical if a single-budget definition of a household is adopted, in effect narrowing coverage to the couple and dependent children.

Eurostat recommended in its IAHS methodology that, where equivalence scales are used in the estimation of incomes of agricultural households, that these are the same as scales currently employed within national household budget surveys. When calculating income results, Eurostat further requested that these are calculated on the basis of three different measures:

- Income per household
- Income per household member (that is, divided by the number of people in the household)
- Income per Consumer Unit (that is, after applying an equivalence scale)

The use of an average income per household member or an equivalence scale when applied to income implies a particular distribution of income within the household;

averaging implies equal division of incomes (a point made already in the Section IX.1 above). In reality this may not happen, and the spending power may be exercised by particular individuals, others having much reduced levels and, possibly, thereby suffering economic deprivation. The issue of intra-household distribution is considered in more detail in Chapter X. However, reservations that should be borne in mind when interpreting income statistics do not alter the desirability of taking the size and composition of the household into account when reporting them.

This Handbook recognizes that both of these practices (the calculation of income per household member and per consumer unit, and the use of national equivalence scales) should be followed. Details of Equivalence Scales should be made available as meta-data.

IX.4 THE RURAL AND URBAN HOUSEHOLD ENTERPRISE[1]

An ability to classify households, both in their role as consumers and as producers, into rural and non-rural is of considerable importance to a range of public policies. The problems of defining what is meant by rural and urban have been considered elsewhere in this Handbook (Chapter III) and will not be repeated here. Under most definitions of rural, agricultural households will be considered as operating within the rural space and using land in ways that typify rurality. However, it should be borne in mind that, in many OECD and even in developing countries, the **households found in rural areas are not necessarily involved in agricultural production,** even in a minor way. And, on the other hand, also depending on the concept of rural and urban and on the demographic characteristics of the country, a significant proportion of the total number of agricultural households could be found to reside in urban areas.

It is important to stress the conceptual difference between a rural household and an agricultural household, the former meaning a geographic situation of the dwelling and the latter related to the economic activity of the household members.

In most situations the typical agricultural holding is run by an individual person (or a family partnership) that lives on the one and only holding they own. In this most common case, there is identity between the agricultural household and the agricultural holding. Yet, there could also be numerous cases where the farmer, even one operating a family-run non-corporate farm business, has more than one holding or does not live on the one and only holding. In other words, even when not considering the holdings operated by companies, there is neither a one-to-one relationship between household and holding nor necessarily a territorial identity between the place of residence of the household and the location of the holding. Households linked to agricultural holdings could be in rural or in urban areas.

Some indication of the situation in the EU comes from an analysis of the features of rural areas published by the European Commission (European Commission, 2009) and based on the OECD typology of NUTS3 areas (communes/municipalities). In 2006, the proportion of the labour force working in the primary sector (agriculture, hunting,

[1]The repetition here of some material from Chapter III and elsewhere is considered necessary.

forestry and fisheries) was only 17.3% in regions of the EU-27 classified as "predominantly rural" (that is with over 50% of the population living in rural communes, with less than 150 inhabitants per square kilometres), falling to 6.2% in "intermediate" regions (15-50% of the population in such communes) and 1.9% in "predominantly urban" regions. The structure of agriculture means that, at least in most countries, the labour would have been predominantly self-employed in farming. These figures are based on the main occupation of individuals in the labour force, so will understate the proportions that have some involvement with agriculture[2]. A consequence of these findings is that, while the large majority of agricultural households are likely to be found in rural areas, not all are. In these areas most of the households, even those with self-employment as their main income source, will be non-agricultural in terms of their predominant economic activity.

In developing countries, however, the rural population is relatively more important and agriculture accounts for a far higher proportion of the labour force. According to FAO statistics for 2001 (taken from its website), in developing countries 59% of the population was classed as rural (62% in the developing countries of Africa and Asia), in contrast with 37% in transition economies and 22% in industrialised countries. While the proportion of the population that is rural has been in decline since 1980 in each of these categories, the fall in absolute numbers in developing countries has been the most substantial. Agriculture, which accounted for only 6% of the labour force in developed industrialised countries in 2001, was the main occupation of 22% in countries in transition and 43% in developing countries (48% in East and Southeast Asia).

Many of the people who live on farms may not regard the farm as their main activity. Residence on an agricultural holding is of little meaning as a basis of classification in many parts of Europe where distances are often small enough for people to commute from farms (often little more than rural houses with particularly large gardens) to their regular place of work in urban areas. Conversely, it is quite possible, though less common for farmers to live in towns and for them to commute to their farms. In this case the location of the household's dwelling may not be where the farmed land is situated. In the Brazil Census of Agriculture 2006, more than 23% of the operators returned a different home address from that of the agricultural holding, and 13% had their residence in urban areas. Up to 1983, the USDA produced income statistics for "farm residents"; a farm was (and still is) defined as an establishment from which a given minimum value ($1,000) of agricultural products was sold or would normally have been sold in a year. A set of objections similar to those in Europe led to the discontinuation of the USDA series after almost fifty years, though analysis of farms is still made on this basis (see Banks *et al.*, 1989). Residence does, of course, cover both self-employed and hired workers and thus extends to households that are not agricultural, in the sense that they receive income from self-employment in agriculture.

[2]A special report to the Countryside Agency in the UK (*Self-employment in rural England* by Elaine Kempson and Michael White, 2001) drew on the Family Resources Survey of 1998/99 and 1999/2000 to analyse the personal characteristics and incomes of self-employed people and employees in agriculture and forestry and to contrast them with the self-employed and employees in urban households. Reference is made to gaps in responses to income questions and the under-estimation of incomes of self-employed (with correction factors of 1.2 to 1.5 mentioned but not applied to the results). Agriculture/forestry accounted for 10% of the self-employed people in rural areas.

IX.5 DEFINITION OF THE AGRICULTURAL HOUSEHOLD-FIRM (ENTERPRISE) AND THOSE BELONGING TO OTHER SOCIO-PROFESSIONAL GROUPS

Neither the SNA (93 or 2008 versions) nor the Canberra Group explicitly considers what characteristics should cause a household to be classified as being an agricultural household rather than one belonging to some other socio-professional group. Yet the manner in which the agricultural community is defined has a strong relationship with the utility of statistics to assist in policymaking decision (their *relevance* to users) because it carries important implications for the results, both in terms of the numbers of households that qualify and the income results that emerge.

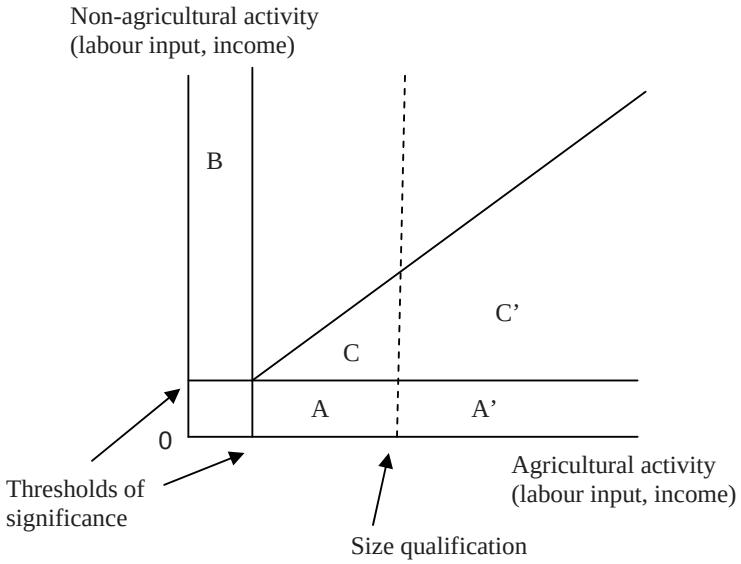
Several criteria can be used to qualify those households as agricultural, and the one which is appropriate will depend on the purpose for which these have to be distinguished from other households. The issue for the EU has been discussed in the context of which households comprise the agricultural community (Hill, 1990). Meanwhile, a longer history of studies in the US has been particularly concerned with the recipients of the rewards from farming (Banks *et al.*, 1989). *Residence on a farm*, already dealt with above, is problematic. *Ownership of agricultural land* is another possible criterion, perhaps with a minimum size qualification (such as the threshold for inclusion in the EU's Farm Structure Survey) to eliminate large gardens. However, we are here mainly concerned with the operators of agricultural holdings (holders) and their households, not landowners (although there are good economic arguments for believing that the ultimate beneficiaries of income support are the owners of land - land being the factor of production in least elastic supply). Some, but not all, of these owners will be farmers, with the share of owner-occupation varying widely between countries.

A more plausible approach in the present context is to define an agricultural household in terms of its dependency on self-employment in farming for the household's livelihood. One way is to look at the **pattern of working time**; an agricultural household might be taken as those households in which at least one member spends some time working in agricultural production. However, this would include every one who grows some of their own vegetables in their gardens for hobby purposes as well as those for which this is a subsistence activity (that is, it substitutes for income-generating activity that could be used to purchase these commodities). These domestic producers, while not normally considered as part of the agricultural industry in many industrialised market economies, may be seen in a different light in countries with a history of collectivised agriculture or at lower levels of economic development where their production contributes significantly to overall output. If it is desirable to exclude these households, some cut-off might be used below which producers would not be considered as "real" farmers. Examples include minimum labour input (in days), a minimum area, or a minimum amount of output. Similar cut-offs are used in agricultural statistics to set the bottom limits of what constitutes a farm (or agricultural holding). In the United States, for example, the definition of farm applies to operations with $1,000 of agricultural sales or the potential to generate such sales. A variant of this would be to include only those households where the members spend the *majority* of their time working on their farms. Box IX.2 illustrates some of these combinations.

BOX IX.2
Possible ways of selecting agricultural household on the basis of proportions and levels of agricultural activity

The "broad" and "narrow" ways of defining agricultural households, applicable when using either a labour input or an income criterion, are explored further in the Figure below (from Hill, 2000). Agricultural activity (time or income) is shown on the horizontal axis and non-agricultural activity on the vertical. On both margins there is a level of activity which can be treated as irrelevant (kitchen garden production, hobby furniture repairing etc.). Only households which are within A or A' are unambiguously agricultural: Those in B are similarly non-agricultural. Those which lie in C or C' use the majority of their labour for agriculture or derive most of their income from it, and could reasonably be labelled as agricultural. The division between A and A' (and C and C') might result from the imposition of some size qualification. If only a small amount of labour was spent in agriculture, even if little or none was used elsewhere, the household might fail to be regarded as agricultural and might be classed as non-economically active. Qualification tests outside this framework could also be employed; minimum holding areas or output values could be imposed before a household entered the frame.

Combinations of agricultural and non-agricultural activity:



At the level of the individual it may be relatively easy to collect data on what the respondent declares as his or her "main occupation." This is often a subjective judgement but is usually consistent and relatively stable. However, the use of a time allocation method at the household level is far more difficult in practice, requiring the labour records of each household member. These are rarely available in a reliable form. Another drawback of this labour input approach is that the notion of work may be too restricting. It is simplistic to treat only physical labour as work. On many larger farms physical labour may form only a small part of the operator's activities and it may be difficult or impossible to separate out time spent on managing the farm from that spent managing other activities. The two may even be synergistic.

Probably a better basis of classification in the context of industrialised countries is **income dependency**. This is the system proposed for the disaggregation of the households sector of national accounts in the SNA 1993/2008 (and the ESA95). At its broadest, the agricultural household could be defined as one in which anyone makes some income from self-employed farming activity. This would cover a wide diversity of households containing self-employed (independent) individuals, ranging from those for which farming was a commercial activity and the main source of livelihood to the many others earning only very small amounts from farming and whose main income came from other sources. Although constituting part of the agricultural community when defined in the "broad" way, this latter group could not be considered as being dependent on farming for their livelihoods.

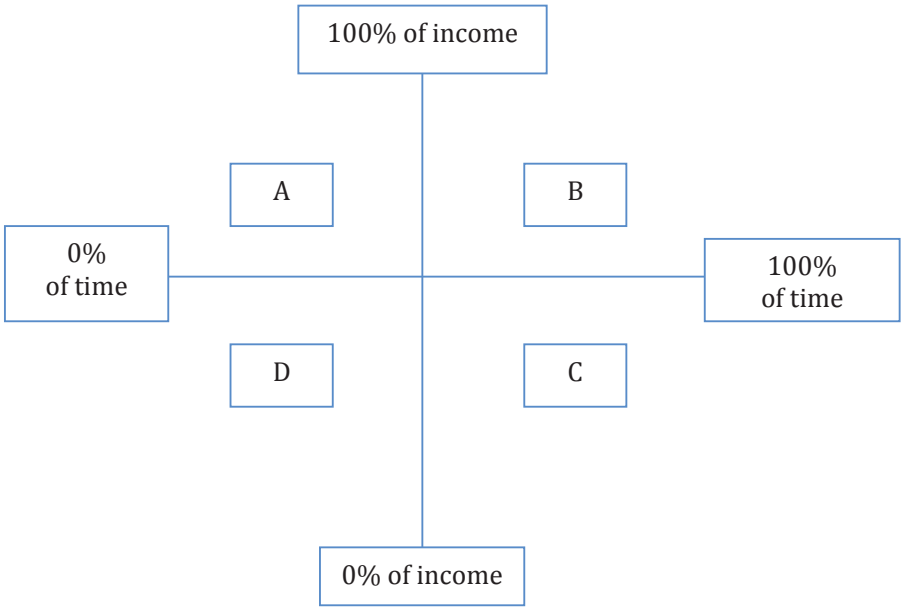
IX.5.1 SELECTING FROM THE "BROAD" DEFINITION OF AN AGRICULTURAL HOUSEHOLD

Following on from the above, it would be possible to define an agricultural household in a very broad way to include all those that derived any income, however minor, from agriculture or contributed some labour input to agricultural production. The next step then becomes one of selecting cases from this broad coverage in ways that would be policy-relevant.

Equity between the living standards of agricultural households and other socio-professional groups is an explicit or implied aim of agricultural policy in many countries (see Chapter II). Thus there is a need to be able to draw comparisons between occupation groups on a harmonised basis. One relatively straightforward approach to achieving this would be to apply a "narrow" definition and include in the agricultural household group only those that were mainly dependent on farming for their means of livelihood. This would include households that derived half or more of their total income from self-employment in agriculture or where it was the largest single source of income (which is not quite the same). The basis of this classification permits a consistent and complete allocation of all households into socio-professional groups, of which agricultural households could form one. In addition, by deriving results for both the "broad" and "narrow" definitions of an agricultural household, it should be possible by subtraction to obtain information on those "marginal" households in which farming generates some income but where it is not the main income source.

If, on the other hand, environmental policy is the issue, selecting a broad group (such as households deriving any income from agriculture) may be more relevant. This is based on the potential for large amounts of environmentally sensitive land to be controlled by those earning only very small amounts from farming and whose main income is derived from other sources. It is also possible that policy interest may be in households that use labour input to agriculture, or who use some combination of income dependency and labour input. These are combined in Box IX.3, which shows the percentage of income derived from, and the percentage of time used for, agriculture, together with situations where the combinations might have policy relevance (from Hill, 2000). A similar approach combining income and occupation (of the operator) has been applied in the United States by Ahearn and Lee (1991). Additional criteria might also be applied, such as size of farm or enterprise types or region, where these are of policy concern.

BOX IX.3
Possible ways of selecting agricultural household on the basis of proportions and levels of agricultural activity



On the assumption that a 50 percent line can be used to divide the agricultural from the non-agricultural, cases falling into quadrant B may be confidently treated as agricultural since they satisfy both criteria. Similarly those in quadrant D could be classed as non-agricultural, though they operate holdings and are therefore beneficiaries of any price-support regimes for agricultural commodities which might exist. However, D might also include some households which might be regarded as legitimate targets of agricultural policy; households on farms too small to absorb all the available labour (yet too large to be dismissed as not really being farms at all), where there currently are no other opportunities for alternative employment, and where there is major dependence on welfare transfers as a source of income. Policies of farm modernisation or the promotion of rural diversification may offer hope for some of these. Also covered here would be high-income households whose farms may be large but whose non-agricultural activities may generate even larger non-farm incomes and where little household labour is spent on the farm, operations being carried out by hired managers and workers. Quadrants A and C contain further complex mixes of farming situations. For example, C would cover, on the one hand, the semi-retired businessmen, filling his time on the farm carrying out unnecessary tasks while receiving a high income from his former business in the form of director's remuneration and dividends on his investments and, on the other, a low-income farm household struggling against severe natural production conditions which absorb most of its available labour but yet which leave it primarily dependent on other sources of income.

Quadrant A would include the large-scale farmer who arranges his farm so that he can spend large amounts of time off the holding doing, for example, unpaid political work, or in leisure pursuits.

IX.5.2 SOME PRACTICALITIES OF CLASSIFICATION

a) Reference person system

In practice, classification systems based on the characteristics of whole households (income composition or labour input) often prove difficult to implement because of data problems. An alternative is the **reference person** system (where this person is typically the head of the household). The SNA2008 mentions this approach (paras 24-40 and 41), including the possibility of sub-sectoring according to the industry in which the reference person works, though the criterion for doing so (income derived or time spent) is not stipulated. Under this system, the whole household is allocated to the agricultural group if the reference person satisfies the criteria for inclusion. A reference person system carries with it the possibility that the nature of the total household may be poorly represented. For example, an elderly head-of-household farmer may have living in his household many younger people whose main occupations and income sources are off the farm.

While the household may be classed as agricultural using a reference person occupation system, it might be non-agricultural in terms of its overall income composition or labour allocation. Such situations can be reduced by imposing criteria to determine who is taken as the reference person; it could the member with the highest income. In SNA 2008 how the reference person is chosen is left flexible, though economic factors (main income earner or main decider of consumption decisions) is clearly preferred over age or subjective judgements by other members as to who is the "head" of the household. Anomalies have to be accepted in the interest of practicality.

A reference person system is used in Family (Household) Budget Surveys in the EU, though there are differences in the rules determining who is regarded as the reference person and how his/her occupation group is determined. Within Eurostat's (now-suspended) IAHS statistics, following conventions in national data sources, in many Member States (most notably France, but also including Spain, Portugal, Italy, Greece, and Belgium) classification was determined not by income composition but to the reference person's declared main occupation. Typically this was interpreted subjectively by the respondent and could be a mixture of income composition and time allocation, or predominantly time. However, evidence from Ireland suggests that the difference in results between using income composition and time allocation can be substantial (Eurostat, 2002).

b) Variation of income for classification purposes

An important caveat must be borne in mind when applying criteria that involve the selection of households according to their position on a continuum. This is that there must be some degree of **stability in the variable used for classification purposes**. In this respect labour input, or a self-declared subjective judgement of the head of household's main occupation, may be superior to income composition. This is especially true of farming with its inherent income instability. Not only will the number of agricultural households where farming is the main income source change, but also the average income levels of those remaining in the group will alter. Evidence from Germany (Cordts *et al.*, 1984) and Norway (Hegrenes *et al.*, 2001) suggests that taking a three-year period removes most of the unpredictable variation in incomes, an approach

supported by analysis in France (Brangeon *et al.*, 1991). Using longer periods gives more stability but there is an increasing danger that changing farm structure (changes in the size distribution of the farms concerned) will affect the long-term trend in income variability. There is a tendency for the classification system to respond to changes in the numbers of households in ways which hide the cases in certain categories, and sometimes these are the ones of greatest interest. For example, while the number of holdings deriving some income from farming may be declining in a stable and predictable way, if falls in income from farming are concentrated among the small, low-income farms, this may disproportionately affect the numbers whose main income comes from farming.

Many of those with the severest income problems may be de-classified as agricultural households. This is seen in an extreme form when incomes from farming fluctuate and annual re-classification (on the basis of single-year income composition) takes place. Empirical evidence from Denmark, reported to Eurostat's IAHS statistics, demonstrated that it is quite possible for the residue of households left in the agricultural group in years of low farm profitability to be occupiers of the larger, more successful farms. On the smaller farms, the low farm profits shifts the balance in income composition to the extent that they no longer fall into the agricultural group. In consequence, the average total incomes of the remaining agricultural households are seen to increase when the general prosperity of agriculture falls, a perverse result. Thus it may be necessary to pay attention to both what is happening to numbers and income levels among agricultural households defined in the "narrow" way, and to what is happening in the "marginal" group where farming is not the main income source.

The absence of empirical examples from developing countries when discussing this issue is to be regretted.

c) Falling household numbers over time

Even if short-term instability can be eliminated, the households that are labelled as agricultural will not form a constant group over time. In the long term, agricultural household numbers will decline, in line with the historic trend. Agricultural policy reform is likely to accelerate this decline. For example, the households which are most successful in diversifying into non-agricultural activities can be expected to eventually fall outside the agricultural group as defined in the "narrow" sense, and to join some other. Even farmers who face a fall in their income from farming without developing other earnings will eventually be excluded from the agricultural category as their welfare transfers grow in relative importance. Thus, when commenting on income developments over time, changes in the composition of the group of agricultural households must be borne in mind.

Given the above, it is desirable to have data that enables a study to be made longitudinally through time, that is, **a panel approach**. If the policy interest is to trace the development of income of people who started any given period as members of agricultural households, some attempt should be made to retain these in the group. **Income averaging** over a short run of years for the purpose of classification also requires individual cases to be maintained and identified in the data system. This represents a major challenge to the way that official statistics are organised (typically as a snapshot at a particular moment), since longitudinal analysis of a constant sample is at

present very rare and data are not often organised in ways that makes this easy. The need for this demographic approach is, of course, something that is shared by studies of businesses in other sectors.

This Handbook recognizes that, as good practice, data should be available to develop estimates of income for households defined as agricultural in alternative ways. This flexible approach should permit a coverage of all households that earn any income from self-employed farming activity. However, it should also permit the selection of households where agriculture is the main income of the household (preferably smoothed to take into account the year-to-year variation anticipated by farmers, for which averaging over three years is advised). Secondary criteria may also be applied, such as farm size. Where it is not possible to use household income composition for classification, the Handbook recognizes the use of a reference person system, where the person is normally the main income earner. Studies should be undertaken to assess the significance of adopting alternative bases of classification.

IX.5.3 CHOICE OF OTHER SOCIO-PROFESSIONAL GROUPS WITH WHICH TO COMPARE AGRICULTURAL HOUSEHOLDS

Frequently, users wish to compare the economic situation of agricultural households with that of other socio-professional groups or with all non-agricultural groups or with the national average.

Caution is advised on making such comparisons. It should be remembered that:

- The income of agricultural households often includes entrepreneurial income (see the definitions given in Chapter X). In conventional accounting systems entrepreneurial income comprises a hybrid of rewards, including not only the reward to unpaid labour but also to the capital and land owned by the entrepreneur. In contrast, the national average is dominated by households whose main income comes from wages or social benefits. While the nature of the income composition is not relevant for short-term comparisons of the ability to spend or save (the main issue being the funds that are available to consumption or saving), this may not be valid in longer-term exercises.
- As noted above, the national household average will often be dominated by single-person households (comprising mainly the young and old), so adequate steps have to taken to respect differences in size and nature of households in the groups to be compared. In addition to income per household, the use of income per household member and income per Consumer Unit (calculated using equivalence scales) is recommended. Alternatively, comparisons can be made only using households of the same demographic characteristics (such as households containing two adults and no children).
- There is often special interest in comparing the income of farm households with those of other business people with enterprises of similar size in rural areas.
- The accounting systems used to generate income figures may not capture adequately all the elements of income that should be included in comparisons. For example, the output of food that is consumed by the farm household, or costs

of private living that are treated as business costs, will need adequate identification and evaluation before satisfactory comparisons can be drawn. In some regards, comparisons between agricultural households and the operators of other small businesses avoid some of these difficulties.

- Capital gain may be an important source of income for agricultural households that own land that is not available to other groups in society and consequently is not normally covered in measures of current income.
- Income variation, and the way in which it is viewed, including any countermeasures taken, can vary between socio-professional groups. Thus income averaging may be appropriate where this is feasible.

These issues relating to the definition of income are examined in greater detail in Chapter X. Possible typologies of other socio-professional groups for use in comparisons are given in section IX.7 below.

This handbook recognizes that steps should be taken to avoid misrepresentations when drawing comparisons between the income situation of agricultural households and other socio-professional groups. At the least, this should include income comparisons per household member and per Consumer Unit.

IX.6 HOUSEHOLDS CONTAINING HIRED LABOUR WORKING IN AGRICULTURE

Among the OECD countries, those within the EU have not, so far, treated the household of hired workers on farms as being within the agricultural community for which the CAP aims to provide a "fair standard of living." Official EU indicators of the residual rewards from farming (entrepreneurial income) exclude the costs of hired labour. Policies have been primarily directed towards assisting the self-employed members of the agricultural labour force, not the hired ones. **Income problems among the households of hired workers have generally been subject only to the normal social provisions for poverty alleviation that apply to all employees**. Some countries where there are substantial numbers of hired workers in agriculture have a special system for monitoring the wages and conditions of service. For example, in the UK there has been a special legal mechanism to set minimum wages and to avoid exploitation that may result from the fragmented and small-scale nature of agricultural employment, and a system to regularly monitor wages and employment conditions. Nevertheless, a range of studies has shown that low income and household poverty are commonly found among the hired section of the farm labour force, a particular problem when this is associated with low wealth, as is often the case.

At this point it is necessary to mention farms that have their **own legal status** (companies or similar forms). Where a family farm takes the legal form of a company the farmer-directors are not, from a legal perspective, self-employed (as they would be as sole traders or as partners) but rather are salaried employees of their own companies. Similarly, any dividends they may receive are not strictly income from self-employment. According to the definition of an agricultural household as one where the head (or the entire household) has self-employment as their main income source (see IX.1 above),

the households headed by hired workers are not included. Applying this rule strictly would mean that the households of the operators of company farms would also not be included. This is the current approach used in the US where non-family farms and farms run by hired managers are excluded from the calculation of farm household income.

In reality, company farms are often family owned and operated businesses that adopt this particular business form primarily for taxation reasons or for other conveniences (such as distributing ownership of a family business among members who do not wish to farm). In most respects such corporation are indistinguishable from unincorporated businesses. Indeed, in the EU's Farm Structure Survey, some Member States record family farms run as companies as if they were sole-traders or partnerships. A common-sense view would clearly include the households of such farmers as agricultural households and as a part of the agricultural community. In practice these farms will often be large and there may be several directors, in which case there is likely to be more than one agricultural household per business.

The lack of statistical attention given to the households of hired agricultural workers can be expected to change, for reasons explored in the next section.

This Handbook recognises that:

Households found on family farms that are arranged as corporations, but that function as unincorporated businesses should be treated as if they were sole-proprietorships or partnerships, and thus be classed as agricultural households. Income results should be shown separately for the households on these quasi-unincorporated farms if possible, which would enable exclusion or inclusion with other agricultural households according the user needs

The income situation of the households of hired agricultural workers should be assessed as a separate and supplementary exercise (a recommendation to be taken with that of the next section). An ability to analyse by the type of business on which they are employed should be incorporated (family farm, corporate farm etc.).

IX.7 RELEVANCE FOR COUNTRIES WITH LARGE-SCALE AGRICULTURAL ENTERPRISES WITH SEPARATE LEGAL STATUS

The statistical treatment of hired agricultural workers, their households and their incomes was thrown into prominence by the enlargement of the EU in 2004 and 2007 and the associated introduction into the sector of significant numbers of large scale-agricultural units that have their own legal status and that have a considerable number of employees. **These are far removed from the "family farm model" that underlies many agricultural statistics**. For example, in Hungary in 2000, corporate units constituted only 0.9% of total farms but these occupied 41% of the area. Though

attention here focuses on Europe, similar issues arise in developing countries where large-scale agricultural enterprises are found (e.g. Brazil and Argentina).

Replies to a Circular Note from Eurostat in the period before the 2004 EU enlargement when the implication for its statistical system was being assessed showed that a range of organisational forms was encountered – agricultural enterprises arranged as joint stock companies, limited liability companies, cooperatives, partnerships etc., though in some countries the business structure was not yet stable. **Several new Member States explicitly stated that the households that work on these large units are considered as part of their agricultural community and are seen as intended beneficiaries of agricultural policy.** Furthermore, these households also commonly operate private plots that generate a significant share of their own food supply and contribute a substantial proportion of the aggregate output of some commodities. However, such plots may also be operated by households that are not associated with large-scale units.

Eurostat confronted the issue of how to treat households of employed workers on these large-scale enterprises as part of its Income of the Agricultural Household Sector (IAHS) project. Though this project was suspended in 2002, its exploration of methodological issues is of relevance here. Eurostat proposed to include income estimates for households found on large-scale enterprises as an "**add-on**." This add-on would constitute a supplementary category of households that, in the interest of simplicity and clarity, covered the households of employees working on ***all*** large-scale agricultural enterprises, irrespective of the form of legal structure that these units took. To be included, the household's reference person must work on a large agricultural unit and that job must be their principal occupation (in terms of income or, failing that, of time). It is assumed that this would be the case for most reference persons.

This "add-on" provision applied to statistics for agricultural households defined in the "narrow" way. The solution appropriate to the "broad" definition of an agricultural household was more problematic and needed further methodological consideration. While the "broad" coverage should obviously include the households of private farmers (deemed to be all those selling to the market and thus generating some income from this activity) and of all workers on large units (to be consistent with the above treatment of reference persons found on them), the issue is complicated by the significant amounts of agricultural production of a subsistence nature that takes place on private plots[3]. This was accommodated by a provisional proposal to include subsistence producers within the "broad" definition of an agricultural household, while still excluding hobby producers, a distinction that is hard to make but which was intended to be consistent with the (activity) Economic Accounts for Agriculture (EAA). How the output from private plots was to be valued in the calculation of disposable income was a further problem, though one also faced by the EAA and national accounts. Eurostat's IAHS statistics were suspended before a practical resolution could be worked out.

[3]In 2001 in Estonia, there were some 176,000 household plots (1.6% of agricultural area) in contrast with 85,300 agricultural holdings (98.4% or the area). Of the 32,400 ha occupied by household plots, which averaged 0.18 ha each, some 2,300 ha were used for potatoes.

This handbook recognises that the income situation of the households of hired agricultural workers on all large-scale agricultural units should be assessed as a separate and supplementary exercise, including a breakdown of the type of unit on which they are found and the forms of income they receive (wages, profit share etc.)

IX.8 TYPOLOGIES OF FARM-HOUSEHOLDS

Finally, three examples are given of typologies of farm households that can be used to generate statistics for policy analysis. All incorporate the structure of household income, and two also involve other socio-economic characteristics.

The first example is the pioneering typology of farm households developed by Eurostat in its Income of the Agricultural Households (IAHS) statistics project for EU Member States (drafted before the enlargement of 2004), to which reference has already been made. This included both a typology of agricultural households and a typology for other socio-professional groups for the purpose of drawing income comparison. Though this project was suspended in 2002, its methodological proposals have been influential.

Focus on European Union: EUROSTAT's IAHS Statistics Typology

The second example of a typology applied to agricultural households comes from the US, where the Economic Research Service (ERS) of the US Department of Agriculture has developed a classification that appears to be more focussed on the needs of policymakers. It is based on a combination of the occupation of the operator and the sales class of the farm. Comparison of income levels is possible with the all-households national average, though the ERS does not provide a breakdown of non-farm families into socio-professional categories.

Focus on Economic Research Service Farm Typology for the United States

The third example of a farm household typology comes from Italy and is based on analysis of 1995 ISMEA survey data. Rather than starting from categories that were primarily determined by policy requirement (as in the US), groupings were developed by statistical techniques from a socio-economic survey of Italian agriculture that was based on general equilibrium household theory. The outcome was a typology of seven categories that bears a striking resemblance to the ERS system for the US.

Focus on Italy: The ISMEA Survey

The three examples illustrate the usefulness of being able to disaggregate the income results, especially in ways that may be of relevance to agricultural and other policies. The similarity of the system devised for the US and the empirical results of analysis in Italy suggests that there may be virtue in adopting the basic typology they contain for application elsewhere, at least among OECD countries.

This handbook recognises the value of the typologies of agricultural households that reflect the needs of users and encourages their development. The basis of the typology should be flexible so that different needs can be met. Consideration should be given to the international application of a classification of agricultural households similar to that used by the USDA-ERS.

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Focus on the definition of Household in United Kingdom: Household Budget Survey and other surveys

Household Budget Survey

In the definitions of a household adopted by EU Member States the condition of living at the same address and sharing catering arrangements is common, though differences occur in the way that live-in domestic staff and temporary residents, such as students, are treated. As an example, for the United Kingdom a household was described thus:

> *A household comprises one person living alone or a group of people living at the same address, sharing their meals and the household, and having sole use of at least one room. All persons in a household must receive from the same person at least one meal a day and spend at least four nights a week (one, if they are married) in the household. The household includes staff, paying guests and tenants, and also anyone living in the household during the period in which expenditure is recorded. Persons who normally live in the household, but who are absent for a period of more than one month, are excluded* (Eurostat, 1985).

Office for National Statistics (ONS) definitions

Household

According to the ONS website (accessed February 2011) there has been a change of definition of a household. Between 1971 and 1980 the definition of a household used in the General Household Survey and in most other surveys carried out by OPCS Social Survey Division was, in summary:

> a group of people who all live regularly at the address...and who are all catered for, for at least one meal a day, by the same person. (See Atkinson, J. *A Handbook for Interviewers.* HMSO, London 1971.)

In 1981 a new definition was adopted, intended to make the survey comparable with the 1981 Census definition of a household. Under the new definition a household is:

> a single person or a group of people who have the address as their only or main residence and who either share one meal a day or share the living accommodation. (See McCrossan, L. *A Handbook for Interviewers.* HMSO, London 1991.)

A group of people would not be counted as a household solely on the basis of a shared kitchen or bathroom.

Household membership

In terms of household membership, under the 1981 definition, a person is in general regarded as living at the address if he or she (or the informant) considers the address to be his or her main residence. There are, however, certain rules which take priority over this criterion.

- Children aged 16 or over who live away from home for purposes of either work or study and come home only for holidays are *not* included at the parental address under any circumstances.
- Children of any age away from home in a temporary job and children under 16 at boarding school are *always* included in the parental household.
- Anyone who has been away from the address *continuously* for six months or longer is excluded.
- Anyone who has been living continuously at the address for six months or longer is included even if he or she has his or her main residence elsewhere.
- Addresses used only as second homes are never counted as a main residence.

Household Reference Person (HRP)

- Householder: the member of the household in whose name the accommodation is owned or rented, or is otherwise responsible for the accommodation. In households with a sole householder that person is the household reference person
- In households with joint householders the person with the highest income is taken as the household reference person.
- If both householders have exactly the same income, the older is taken as the household reference person.

As with the previous head of household (HOH) definition, non-household members are never defined as householders even though they may own or rent the accommodation in question.

Note that this definition does not require a question about people's actual incomes; only a question about who has the highest income.

Main changes from the HOH definition

- Female householders with the highest income are now taken as the HRP.
- In the case of joint householders, income then age, rather than sex then age is used to define the HRP.

This means that in both cases more women will be defined as HRP.

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Focus on Households in Developing Countries

Discussion in the main text of agricultural households and how they may be defined in developed countries acknowledged that there are variations in norms in terms of issues such as extended and multigenerational households that pose problems in establishing methodologies that can generate comparable results. When the spectrum is extended to developing countries, problems of this sort multiply considerably. As Focus Box IX.1 makes clear, in an African context the household, whether defined in terms of a dwelling or single budget unit, may be irrelevant for statistical purposes or in explaining behaviour. Solutions to methodological problems should be sought that are appropriate to local social norms, and what is suitable for Africa may not apply elsewhere. Later versions of this Handbook are likely to elaborate on this crucial issue if the material it contains is to find greater application among less-developed countries.

FOCUS BOX IX.1
Difficulties in using the household as the unit for analysis

A number of criteria can be used to define the household. Those commonly employed include: members have a common source of major income; they share a common source of food; and they sleep under the same roof or within the same compound, etc.
But the criteria used to identify households must be relevant to the local situation, since their size and characteristics show wide variations by principal occupation, locality and country. The household may consist of a single family, but in Africa households commonly comprise several families, kin, and even persons with no kin relationship. It is possible for families to be spread among several households, either temporarily or permanently. For example, a married woman while young may continue to live in her father's household, while her husband lives under a separate roof.

The household is an important social unit because within it many of the decisions concerning individual members' activities and their consumption (and thus their welfare) are made and its physical properties – that it is a collection of individuals with an identifiable location – makes it a useful **sample unit** in survey work. It must be emphasised, however, that households are embedded in wider social networks, their lineage group for example, whose actions partly determine their members' welfare. Given the importance of the household as a decision-making unit, we need a conceptual framework to analyse its decisions over the allocation of resources. Two key issues are raised in the analysis of the household. The first is the role of the household as both the producing and consuming institutional unit. Whereas in much of orthodox economic theory the firm is assumed to be the producing unit and the household the consuming unit, quite different institutional arrangements must be assumed for developing countries. This is especially the case in Africa given the predominance of agricultural activities in total employment and the limited share of formal employment in most countries.

The second issue that has been addressed concerns how household decisions are made – are they reached collectively or does one individual or group dominate the process? A related issue is whether we can speak of a "household welfare function", since there may be conflicts of interest within the household. In theoretical work, individuals are aggregated into households on the assumption that they possess identical preferences based on identical tastes. Household decisions are then analysed in the same way as those for a single individual. Why people should group themselves in a household is usually analysed as a secondary problem, but it is generally assumed that they make up a family. Sen (1983) calls this arrangement the "glued-together family". Alternatively, a "despotic family" is one in which the head of the family takes all the decisions, so the family behaviour is simply a reflection of the head's choice function. These are polar cases – in the former, members of the household are assumed to share the same preferences; in the latter, the preferences of the household head alone are relevant.

Major problems exist, however, in using either the concept of the "glued-together" or the "despotic" family. Preferences, particularly those that arise from age and sex differences, can differ widely among family members so that they will allocate family resources in different ways. The eventual allocation of resources will differ, perhaps substantially from that under "glued-together" or "despotic" families. These difficulties apply with equal force to the unit of the household because large numbers of people can be involved in decisions about its collective resources. In such circumstances, assuming a single-household utility function is even less valid than making such an assumption for a single family unit.

Source: World Bank (1990). *Making Adjustment Work for the Poor: A Framework for Policy Reform in Africa*. World Bank, Washington, pages 38-39.

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Sen, A. (1983). *Economics and the Family*. The Asian Development Review, 1: pp. 14-26.

Focus on European Union: Eurostat's IAHS statistics typology

For its Income of the Agricultural Households Sector (IAHS) statistics project, that ran from the late 1980s to 2002 Eurostat devised a binary classification that divided households with some income from farming (a "broad" coverage) into those that were narrowly "agricultural" and those that are "marginal".

- For its **"broad" coverage** all households were included that derived some income from independent activity in agriculture (other than income solely in kind that was of a "hobby" nature). This income could arise from the activity of the head of the household or any other member.
- For its **"narrow" coverage** the IAHS applied a classification system based on the **main income source of the household's reference person** (Eurostat, 1996), a more practical approach than one that looked at the composition of the entire household's income. This reference person was intended to be the household's highest income earner, who would also usually be the one regarded as the head of the household. How this person was designated varied from country to country, and might be selected by self-declaration or more complex algorithms. Countries where an income-based classification was not feasible (for example, France) were allowed to apply a system based on the reference person's main *time allocation* or on a more subjectively determined occupation or trade group label. It was recognised that some producers of significant volumes of agricultural commodities might be excluded from the "narrow" agricultural group if they had even larger incomes from elsewhere.
- Subtracting the "narrow" coverage from the "broad" resulted in a "**marginal**" group of households that engaged in independent agricultural activity but where the main income was from some other (non-agricultural) source.

The "narrow" definition took precedence in the generation of IAHS statistics because it produced a group that appeared to correspond more closely with the "agricultural community" whose incomes the CAP is intended to support. Of course, whichever definition was being used, the incomes of all household members were summed to achieve a total for the household.

Some idea of the implication of this typology for the numbers of households and income levels can be gained from the seven EU15 countries where this calculation was possible (though spread across several years). The "marginal" households were shown to be present in substantial quantities and in some countries were more numerous than "narrow" agricultural households (see Figure 1). This might present difficulties of acceptance amongst some users if they felt that large numbers of the households they regarded as farmers were being excluded and that the results related to a small sector of the industry that was, in some sense, atypical. This proved a particular problem in Denmark and Ireland because of their socio-economic traditions (see comments in Focus Figure IX.1 below). Though highly heterogeneous, the "marginals" shared the characteristic that agriculture was typically of less importance to them from the perspective of total household income (for example, generating only some 5% of household income in Germany in 1983 and 14% in Ireland in 1987)(Eurostat, 2002 and earlier reports).

Though attention focussed on households, a parallel classification of other institutional units (corporations etc.) might also be envisaged. By summation, a picture could be presented of all units engaged in production or for which it was the major activity or income source.

Eurostat also developed a draft typology of other socio-professional groups, based on national accounts guidelines, to be used for comparative purposes within IAHS statistics (see Focus Box IX.2). Some commentators see the ability to compare the incomes of agricultural households with others in society as important to the achievement of the objectives of agricultural policy, in particular of ensuring the "fair standards of living for the agricultural community" which remains a prime aim of the EU's CAP. Categories shown in **bold** constituted a "minimum" list proposed by Eurostat. Member States that wished to use a more detailed breakdown may do so. In reality, where results were calculated, Member States largely used the bolded categories.

Among agricultural households defined in a "broad" way, alternative and more detailed ways of disaggregating the data were, of course, possible (for example, by size of farm, by type of rural location, by age of principal farm operator). However, in Europe there is no systematic and harmonised approach; what is done is usually determined by national data availability. An interesting example was provided by Ireland, where the combination of the annual national farm survey and the periodic household budget survey enables a flexible and detailed analysis to be carried out, though only in the base years of the household survey (typically every 6 or 7 years). This extends to, at least in theory, the comparison of incomes of farm households defined in various ways with other socio-professional groups. Denmark publishes household income results (total income and disposable income per farm) by size of farm (area and economic size). Germany also breaks down the results of total and disposable income from its farm accounts survey into averages for "full-time" (subdivided by size), "part-time" and "spare time" farms. (For a review of these and other country breakdowns see Hill, 2000). These breakdowns use conventional categories and are not explicitly policy-orientated.

FOCUS FIGURE IX.1
Implications of using "broad" or "narrow" definitions of an agricultural household

The following numbers of agricultural households and average incomes are contained in Eurostat's reports from its IAHS statistics. They come from a number of national sources, some routine annual exercises but many others from special studies, some of which are now quite historic.
Number of households and levels of average net disposable income for three groups of agricultural households, in selected Member States:

AGRICULTURAL HOUSEHOLD	Denmark (1999)	Germany (1983)	Greece (1994)	Ireland (1987)	Netherlands (1988)	Finland (1992)	Sweden (1992)
No. agricultural households (x 1000)							
"broad"	57	613	615	207	136	139	94
"narrow"	16	353	398	85	87	73	54
"marginal"	41	260	217	122	49	65	41
Disposable income per household (all households = 100)							
"broad"	99	110	114	105	210	124	81
"narrow"	105	101	86	127	267	131	79
"marginal"	92	123	166	89	108	116	85

Source: Eurostat (2002). *Income of the Agricultural Households Sector 2001 report.* Theme 5. Eurostat, Luxembourg. ISSN 1725-1605.

The relationship between numbers of households in the three categories reflects real differences in national socio-economic conditions. For example, in **Denmark** the transfer of land between generations typically takes the form of sales between parents and children, something that is not usual elsewhere in the EU. Specialist lending institutions grant loans for this purpose. To meet interest charges it is common for one or more members of the successor's household to take a non-agricultural job, something that can influence the choice of enterprise on the farm. Interest charges also reduce the profit from the farm business. The result is farming that appears unprofitable (in the short term) because of a high debt burden and relatively few households where the farm forms the main income source. In the longer term, the death of parents implies the release of capital to the succeeding generation. In **Ireland** demographic conditions appear to have produced relatively large numbers of household comprising single older males who are dependent on social benefits.

FOCUS BOX IX.2
Typology of socio-professional groups for use within IAHS statistics (a disaggregation of the households sector account)

(a) Employers and own-account workers

(i) **Farmers** (This group should not include forestry or fishery households. Where it is not possible to exclude them, this should be made explicit)
(ii) **Others**

- Retail and wholesale distribution; accommodation and catering
- Services (including professions operating as own-account workers)
- Others (including manufacturing industry)

(iii) **All self-employed [(a)(i) + (a)(ii)]**

(b) **Employees**

(i) Manual workers in agriculture, industry and services
(ii) Non-manual workers
(iii) All employees [(b)(i) + (b)(ii)]

(c) **Others**

- Recipients of property income
- Recipients of pensions
- Recipients of other current transfers
- All others

(d) **All households except farmers [(e) minus (a)(i)]**

(e) **All households [(a) + (b) + (c)]**

Source: Eurostat (1996). *Manual on the Total Income of Agricultural Households Rev.1.* Theme 5 Series E. ISBN 92-827-5227-5

FOCUS PIECES

Eurostat (1996). *Manual on the Total Income of Agricultural Households (Rev.1).* Theme 5, Series E. Eurostat, Luxembourg. ISBN 92-827-5227=5.

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Hill, B. (2000). *Farm Incomes, Wealth and Agricultural Policy.* 3rd ed. Ashgate Publishing, Aldershot, ISBN 0-7546-13-9.

Focus on Economic Research Service farm typology for the United States

In the United States the Economic Research Service (ERS) of the Department of Agriculture has developed a classification that appears to be more focussed on the needs of policymakers (ERS, 2001). Based on a combination of the occupation of the operator and the sales class of the farm, it identifies five groups of small family farms (sales less than $250,000).

- **Limited resource**. Any small farm with gross sales less than $100,000, total farm assets less than $150,000, and total operator household income less than $20,000. Limited-resource farmers may report farming, a non-farm occupation, or retirement as their major occupation.
- **Retirement**. Small farms whose operators' report they are retired (excludes limited-resource farms operated by retired farmers).
- **Residential/lifestyle**. Small farms whose operators report a major occupation other than farming (excludes limited resource farms with operators reporting a non-farm major occupation).
- **Farming occupation/lower-sales**. Small farms with sales less than $100,000, whose operators report farming as their major occupation (excludes limited-resource farms whose operators report farming as their major occupation).
- **Farming occupation/higher-sales**. Small farms with sales between $100,000 and $249,000 whose operators report farming as their major occupation.

In addition, there are three categories of farms that are considered large in that their sales exceed $250,000. This threshold is admittedly arbitrary, with the ERS choosing $250,000 at the suggestion of the National Commission on Small Farms.

- **Large family farms**. Farms with sales between $250,000 and $499,999.
- **Very large family farms**. Farms with sales of $500,000 or more.
- **Non-family farms**. Farms organised as non-family corporations or cooperatives, as well as farms operated by hired managers.

This typology now forms the basis for disaggregating ERS reporting on farm household and business performance and will be used to evaluate the impacts of changes in agricultural legislation. According to Offutt (2002), disaggregation using the typology shows very clearly how dependence on farm income varies by farm type. In 1999, only households operating very large farms acquired more than 80% of their total income from their farm business.

For large farms, farm income accounted for 60 percent of total income while for higher-sales small farms, half of total income came from farming. The remaining small farm households derived virtually all their income from off-farm sources. Off-farm income, therefore, is as important, or more important, than farm income to the wellbeing of most of America's farm families.

The data on household income also show distinct differences in levels compared to United States average household income (more detailed comparisons with separate socio-professional groups are not offered in the USDA-ERS publication). As noted, the

average farm household income in 1999 was about a third higher than the average for all United States households. But, again, this average masks significant variation.

For example, the average household income for limited-resource farms lay below the poverty level while the average household income for the very large family farms was more than three times the national average. On smaller farms where the operator's main occupation was farming, the higher-sales group's total income was just above the national average while the lower-sales group lay just below it. In addition, total income from retirement farms lay just below the national average.

Residential/lifestyle farms had negligible or negative income from their farm but had overall household incomes above the national average. These comparisons of farm household income across typology groups demonstrate the value of survey data in presenting a cross-sectional view. In addition, it emphasises the value of using the household as the basic unit of observation.

FOCUS PIECES

Economic Research Service (2001). *America's diverse family farm: assorted sizes, types and situations*. Economic Research Service, US Department of Agriculture, Washington.

Offutt, S. (2002). *What is agriculture*. In Piersimoni, F. (ed.), *Conference on Agricultural and Environmental Statistical Applications in Rome* – CAESAR. Second World Conference of Agricultural Statisticians. Volume 1, p59 – 68. Rome: National Statistical Institute of Italy (ISTAT). Essays n. 12/2002. ISBN 88-458-0835-1.

Focus on Italy: the ISMEA survey

A typology of farm households for Italy was based on analysis of 1995 ISMEA survey data which used a sample drawn from the 1992 Agricultural Census (Napoletano *et al.*, 2001; Castagnini *et al.*, 2003). This survey collected data on farm budgets, household and farm characteristics, time use, off-farm money income, governmental and intra-household transfers, consumption, and information about the degree of autonomy in decision-making by household members. A farm size threshold of four European Size Units was applied to exclude households where agricultural activity was negligible or marginal. Rather than starting from categories that were primarily determined by policy requirement (as in the United States), groupings were developed by statistical techniques from a socio-economic survey of Italian agriculture that was based on general equilibrium household theory for those engaged in entrepreneurial activities. The main thrust of the work was to establish links between the micro- and macroeconomic levels of economic and policy analysis.

The outcome was a typology of seven categories that bears a striking resemblance to the ERS system for the United States (see Focus Table IX.1 below). The breakdown by type, and their geographical location, enabled some key conclusions to be drawn. For example, limited resources farms contributed only two percent to agricultural output but 70% of them were concentrated in the *Mezzogiorno*, an area suffering from structural disadvantages and where there were currently very few alternatives to agriculture. This finding suggested that, for this part of Italy, policymakers should focus their attention on programmes of economic and rural development rather than on agricultural support.

FOCUS TABLE IX.1
The ISMEA survey-based typology

FARM TYPE	DESCRIPTION
Limited Resource	Any small farm with global family income, gross sales and total farm asset less than the first quartile of the respective distribution.
Retirement	Small farms whose operators report that they are retired.
Residential	Small farms whose operators are not retired and report a major occupation other than farming.
Small family farms	Small farms with gross sales less than the first quartile of the distribution and whose operators report farming as their major occupation.
Medium family farms	Any farm with gross sales less than the third quartile of the distribution and whose operators report farming as their major occupation.
Large family farms	Any farm with gross sales over the third quartile of the distribution.
Non-family farms	Any farm organised as non-family corporations or co-operatives, or operated by hired managers.

Source: *Napoletano et al. (2001)*

FOCUS PIECES

Castagnini R., Perali, F. & Salvioni, C. (2003). *Dallo sviluppo agricolo a quello rurale: che informazioni sono necessarie?* A. Arzeni, et al. (eds.) *Politiche di sviluppo rurale tra programmazione e valutazione.* Franco Angeli, Milano.

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CHAPTER X

DEFINITIONS OF INCOME

X.1 INCOME AS FACTOR REWARDS AND AS SOURCE OF CONSUMPTION SPENDING

A distinction has already been made (Chapter VIII) between drawing up accounts relating to an activity and accounts relating to institutions, of which the household is the form of particular interest here. This is reflected in two approaches to income in agriculture. One sees income as a reward that owners of fixed factors of production receive as a result of allowing their land, capital and labour to take part in agricultural production. The other sees income as the flow of resources that agricultural households (those of farm operators) receive that may be spent on consumption and on saving.

The traditional way of monitoring the economic situation in agriculture has been by means of indicators of factor reward (Hill, 2000)[1]. These can relate to all the fixed factors (land, labour and capital) irrespective of who owns them (as reflected in Net Value Added). Alternatively, by deducting charges for hired labour, borrowed capital and rented land, only those factor rewards belonging to the farmer and other family labour are revealed. This residual is often taken to be the income accruing to farmers and the unpaid members of their households for working in agriculture and using their land and capital in this industry.

However, households that operate farms often receive, in addition to their rewards from farming, income from running non-agricultural businesses, from waged employment, from social transfers etc. It is important when assessing the welfare of agricultural households not to assume that these other sources are unimportant. Empirical evidence suggests that they can be of great significance in many countries at all levels of development (OECD, 2003). For example, in the United States (US) over four-fifths of the household income of farm-operator households regularly comes from non-farm sources; in 2008 this was 89 per cent (ERS Briefing Room website) and in 2000 over 95 per cent, a year when the share of non-farm income was particularly high (Mishra *et al.*, 2002).

[1]Parts of the text of this draft of chapter were taken from Hill (2000).

Evidence over time suggests that these other forms of income are becoming more important in many countries. However, the relative dependency on the farm for income varies widely among agricultural households, reflecting a number of factors including farm size. For some, farming will be their only income source, but for others it will be insignificant (in 2000, on only 11 percent of US farms did the occupiers make more than half of their household income from farming). It is clear that the farm/non-farm income balance is particularly sensitive to the definition of what constitutes an agricultural household.

Not all the resources flowing towards farm households are available for spending or saving. Some allowance has to be made for maintaining the stock of productive capital by re-investment. In addition, some payments have to be made that are not optional or discretionary, such as direct taxation and contributions to social insurance schemes. Such factors have to be considered when selecting the appropriate income indicator.

X.2 RELATIONSHIP BETWEEN HOUSEHOLD RESOURCES, INCOME AND EXPENDITURE

In considering the economic situation of agricultural households it is instructive to first take an overall view of the resources flowing to these households and the way in which these resources are used for acquiring the means for living. Figure X.1, adapted from Cecora (1986) comprehensively demonstrates the resources used to support the "subsistence" of private households.

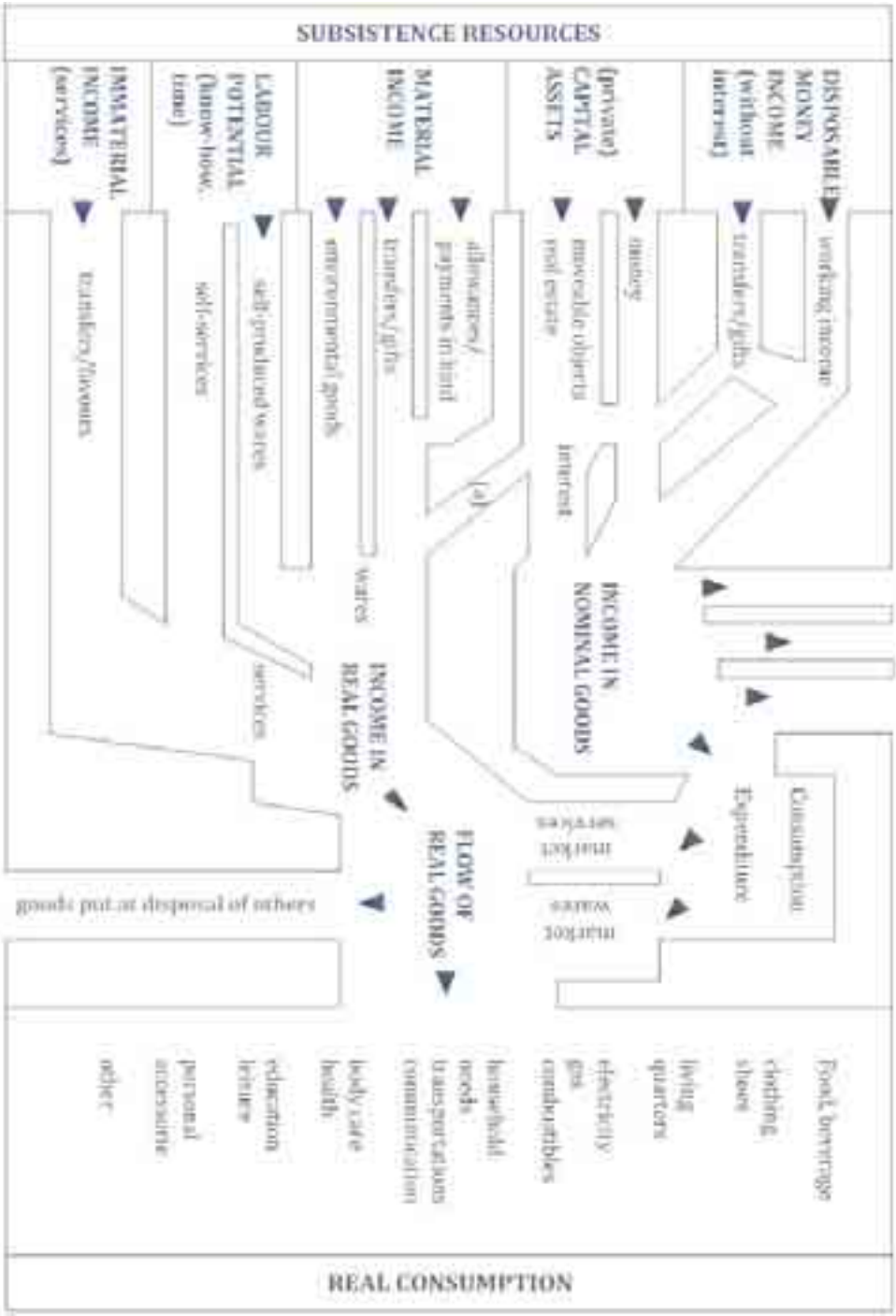
Resources take both monetary and material forms and are derived from a variety of sources (from work, from property, from private or public transfers etc.). Resources are also used in several ways, including the acquisition of consumption goods and services. It follows that this flow can be measured at various points and with various degrees of completeness. Most practical income measurements concern that part of the flow that comprises "nominal goods" in Figure X.1. However, as will be demonstrated, some forms of income in real goods are normally included (especially the housing services provided by owned dwellings). Having said this, there is also a need to consider other activities that might be deemed to constitute part of income, such as what happens in the home, and whether resources that arrive irregularly, such as inheritances of money or assets, should be treated in the same way as regular earnings from economic activities and social benefits. It is important to remember that the assessment of income usually involves the drawing of rather arbitrary boundaries in the overall flow of resources, the suitability of which will depend on the particular circumstances.

The measurement of personal income constitutes a subset of this flow. A widely accepted definition of personal income is that given by Simons:

> *Personal income may be defined as the sum of (1) the market value of rights exercised in consumption and (2) the change in the store of property rights between the beginning and end of the period (Simons, 1938).*

It is important to note that these consumption rights include those that *could* be exercised in addition to those which are actually used; otherwise a high earner who spent little might be grouped with a low earner who spent everything.

FIGURE X.1
The "subsistence" of private households



(a)Use of private property.
Note: this figure has been modified by Cecora, 1986

Income is only numerically identical to consumption when the store of rights, in the form of savings, remains constant. We would expect the low spending high earner to accumulate savings over the period. At the same time, in low income agricultural households, who are often of particular concern to policy makers and where long-term saving rates are low, total consumption will be roughly equivalent to income. This observation provides a rationale for using consumption as a proxy for income in developing countries as described in more detail in Section X.6 of this chapter.

This notion of personal income also corresponds to that put forward by Hicks (1946), who described an individual's income as the maximum value he could consume during a period and still be as well off at the end of the period as he was at the beginning. The concept of income set out in the UN's System of National Accounts (SNA93 and SNA2008) (UN, 1993 and 2008) is closely aligned with that described in Hicks. In the SNA, the theoretical view of disposable income is "*... the maximum amount that a household or other unit can afford to spend on consumption goods or services during the accounting period without having to finance its expenditure by reducing its cash, by disposing of other financial or non-financial assets or by increasing its liabilities.*" (SNA93, para 8.15; SNA2008 para 8.25). It follows that increases in "the store of property rights" arising from capital gains constitute positive contributions to personal income, while losses are negative items.

X.2.1 INCOME FROM SELF-EMPLOYMENT

When measuring income according to the approach to personal income outlined above, the flow of resources towards households comes in three main forms:

- from gainful activities (mainly employment and self-employment),
- from the ownership of property (rent from land, interest from financial assets) and
- from transfers (mostly social transfers organized by government but also private ones, such as from family members working abroad).

Each has its own set of technical issues and it is not possible in this Handbook to explore every one in detail. However, of particular concern is the measurement of income from self-employment as, by definition, agricultural households are involved with self-employment (independent activity) in operating a business. Depending on which definition of an agricultural household is applied (see Chapter IX), the farm business may be the only source of self-employment income, the main source or a minor source, but it will always contribute a part of the total.

For self-employed operators of unincorporated businesses income is measured by the net surplus accruing from the production process. This may be labeled **Entrepreneurial Income**. It can be formulated at its simplest as follows, based on the SNA (UN, 1993 and 2008):

	VALUE OF OUTPUT (sales plus own-consumption)
MINUS	Cost of intermediate consumption (inputs purchased)
EQUALS	Gross Value Added
MINUS	Capital consumption
EQUALS	Gross Value Added
MINUS	Cost of paid labour (wages and other costs)
EQUALS	Operating Surplus[2]
LESS	Interest paid and rent paid
EQUALS	Entrepreneurial Income

Similar formulations are used in aggregate (industry level) and micro-economic (farm level) accounting systems. However, there are differences of detail, such as the treatment of subsidies and the basis of valuation (market prices or basic prices). At the microeconomic level, Entrepreneurial Income corresponds to the residual profit generated by the business from its outputs after the costs of production have been met (including both the purchase of variable inputs and the rents, interest charges and hired labour costs relating to the "fixed" factors).

Income from self-employment has some characteristics that set it apart from income from employment (after ILO, 1997).

- As noted above, for self-employed people who operate businesses that use assets (in contrast with those who only supply services), Entrepreneurial Income comprises a mix of returns to the fixed factors (land and capital owned by the operators and both their manual and managerial labour input). This rules out a simple comparison with the income of employees, which does not contain any elements of return to capital or land.
- It is a residual, not determined in advance, which depends on the profits of the production activity. This may have implications for the practicality of measurement and data collection, as calculation is only secure once the accounting process is complete. This may be some time after the end of the period to which the income relates.
- By definition, Entrepreneurial Income includes the rewards to any unpaid labour, which in agriculture often comprises members of the farm family. The implication is that there will be some financial reward received by these unpaid workers. However, in microeconomic accounting in agriculture, a wage is sometimes imputed for non-paid labour other than the farmer and spouse (for example, a wage may be deducted for sons or daughters working on the farm, even when no wage is actually paid or where only a nominal payment is made). This provides for greater comparability between farms operating with different proportions of hired to family labour.

[2]SNA (93 and 2008 versions) describe Operating Surplus of unincorporated businesses as "mixed income". Operating Surplus is not a concept often used at the microeconomic level.

Calculating the profit from the farm business is not without areas of contention. For example, the valuation of biological assets that last beyond one accounting period (such as dairy cows or plantations) is an issue that may impact the residual income. Similarly, the estimation of capital consumption is possible in various ways (for example, valuation at historic cost, replacement cost, different assets lives etc.). When appraising investments, an *ex ante* view of capital consumption may take a different approach from that appropriate to the *ex post* calculation of income. Another approach is that an operator might be allowed to deduct from income that which is viewed as necessary for business reinvestment to maintain viability. In a dynamic environment this might be more than the estimate of capital consumption based on the existing stock and asset lives (ILO, 1997). The treatment of capital consumption (depreciation) and other conventions used in the measurement of business profits for the purpose of taxation may well differ from those that would be adopted in an economic measurement. Although accounting on an accrual basis may be the norm, some tax systems allow farmers to calculate their incomes on a cash basis (OECD, 2003). Such issues have been a concern in the development of an International Accounting Standard for agriculture (IAS 41) which is now in the process of being adopted in many countries[3].

Focus On Farm Accounting Standards in OECD Countries

In estimating the residual income from farming activity for the purpose of assessing agricultural household income, a valuable resource exists in the form of the methodology developed in existing farm accounting systems. For the EU, the European Commission, in association with Member States, has developed an accounting methodology for its Farm Accountancy Data Network (FADN/RICA). Evolving since the mid-1960s, its details are now readily available.

http://ec.europa.eu/agriculture/rica/index_en.cfm

A research network (PACIOLI) has developed in association with FADN/RICA (see for example PACIOLI, 2004). The FADN/RICA methodology includes a list of the items that lead to various income indicators, of which Farm Family Income is the most relevant in the present context; it describes the residual as "remuneration to fixed factors of production of the family (work, land and capital) and remuneration to the entrepreneur's risks (loss/profit) in the accounting year" (European Commission, 2002). Family Farm Income is similar to (but not identical with) the Entrepreneurial Income of the SNA93. As the harmonized basis for microeconomic accounting for farming, including income indicators, in 27 European countries, FADN/RICA will be influential in any international system of farm household income measurement. The equivalent survey in the United States (the Agricultural Resource Management Survey – see Chapter XII) uses a similar approach but calls its residual concept Net Farm Income.

[3]IAS 41 was approved by the International Accounting Standards Committee (IASC) in December 2000 and became effective on 1 January 2003. The objective of IAS 41 was "to establish standards of accounting for agricultural activity - the management of the biological transformation of biological assets (living plants and animals) into agricultural produce (harvested product of the enterprise's biological assets)". The IASC was superseded by the International Accounting Standards Board (IASB) in 2001. It is understood that IAS 41 became IFRS 41 under the revised framework. http://www.iasplus.com/standard/ias41.htm

X.2.2 INCOME IN KIND

Income in kind is a part of the rewards from self-employment. In agriculture, this issue is especially problematic because of the enhanced opportunities that farm households have to consume from the outputs or inputs of the business. Indeed, among many smallholder farmers, especially those in developing countries, it can be the main or sole reason for their undertaking agricultural activity. In attempting to express income as a magnitude of money, it will be necessary to value these goods and services, the relevant question being "How much would the farm family have to pay to consume these items if they did not come in a physical income form?" The problem involves, first, identifying the non-monetary income and, second, choosing an appropriate method of valuation. Some examples of income in kind are straightforward. If a farmer's wife is given eggs in exchange for working on a neighbour's holding for a few hours each week, then these eggs clearly form part of her household's income. The method of valuing them may be open to argument, but there would be little doubt that the eggs should be included. The use of petrol paid for by the farm business but used for private outings would also qualify. These are both items that can be substituted by articles bought in the marketplace - shop bought eggs and petrol bought at the pumps. Others, however, are far more problematic.

While for some classes of agricultural producer the main form of income in kind will be food the household can consume (typical of developing countries and household plot operators in some eastern Member States of the EU), elsewhere its main form can be the fringe benefits associated with farming. The description "fringe" is perhaps unfortunate since it gives the impression that these benefits are unimportant and might be ignored, yet it is precisely these "fringe" elements in the rewards enjoyed by farmers and landowners that those outside the industry frequently find the most attractive. Benefits such as domestic environments divorced from unwanted encroachments by noisy people and traffic, the ability to pursue space demanding activities like horse riding and the opportunity for direct involvement in the protection and conservation of wildlife seem to be precisely the attributes of farming which potential new entrants with adequate fortunes made in other businesses are keenest to secure. They are also those that are protected most vigorously when some external change, such as a transport infrastructure development, threatens them.

In an agricultural context there are two important examples of income in kind where some valuation by imputation is required. The first is the farm household **consumption of food materials produced on the home farm** (often termed own consumption). Food consumed by farm families which they grow themselves involves costs of production borne by the business (fertilizer, tractor fuel, machinery hire purchase charges and so on) which are debit items in calculating income from self-employment. In assessing the total income to the farmer from his business the value of all these own-consumption goods have to be accounted for. A way of looking at home consumption of farm production is that, in the case of any other household, the food would have to be bought from the market using money (or barter), so the real value of the farm household income is greater than it appears nominally by the extent of the household's own consumption. Consequently, farm families would be expected to spend less on purchased meat, milk, eggs etc. than other types of households. Choices have to be made on the method of valuation, the options being to use retail prices, wholesale (or farm

gate) prices, or some estimate of the costs of production. A retail valuation was adopted by Bellerby (1956; p.57) in his seminal work on the relative income position of the agriculture and non-agriculture sectors. However, the practice in the European System of Accounts (Eurostat, 1979, 1996) in its household sector account has been to use farm gate prices, with the justification that on farms the foods consumed from own production do not receive the benefits of packaging, processing and presentation, all of which are reflected in the retail price. Though this particular income adjustment is probably of little importance when comparing the incomes of one group of farmers with other farmers, there could be a substantial impact when ranking farmer incomes against those of other groups in society.

The second example concerns the **services provided by owner-occupied dwellings**. In many countries the buildings on a farm typically include a domestic house for the farm family. Sometimes there is more than one such building. If the house were let to tenants it could command a rent, and by occupying the house the family is in effect receiving the benefit in kind. Consequently, an imputed rental value should be added to the income of the farm household. Similar reasoning would apply, of course, to housing of other socio-professional groups who have accommodation which goes with the job or business, including clergy. Indeed, all owner-occupiers of domestic houses are receiving a flow of services in kind from their property, and a full assessment of their income should take the value of these services into account.

In addition to these two examples of income in kind that are particularly relevant in the agriculture context, a third type, applicable more generally, should be mentioned. These are **social benefits in kind**. These are the goods and services consumed by individuals that are provided in kind by the state and financed from taxation, such as health care and education. As will be seen later, the disposable income of households is sometimes adjusted by these benefits (to form "adjusted disposable income"). While for some items (state-funded dental treatment, perhaps) evaluation of these benefits is relatively straightforward because a market price exists for similar services (for example, the costs of private dentists), for others there may be no parallel market from which values can be taken, or the markets may be so marginal that the prices in them are not satisfactorily representative of the whole. In such cases the average cost of providing these items may have to be substituted as values. Though there are practical problems of identification and valuation, these forms of income in kind should not be ignored, especially where comparisons of household income are made between countries that have different levels of state activity in the health and education sectors or over time when changes in the level of state provision take place.

X.2.3 LIVING COSTS

When comparing levels of disposable income between agricultural households and other groups, and in particular when implying that these can be used as an indicator of potential consumption (and thus "standard of living"), it may be important to note differences in the amount that farmers and their families have to pay for certain goods and services. Food produced on the home farm and consumed by the farm family may be (net) less expensive than if purchased from off-farm sources, and this may also apply to fuel and some land-demanding recreational activities. On the other hand the costs of other goods and services may be greater in rural areas than in urban ones, reflecting

remoteness and sparseness of population. Transport costs are a particular issue; some farm households (and other self-employed people) may be able to spread vehicle expenses between production and consumption activities, whereas this may be denied to others, including both urban and rural dwellers. Thus, caution has to be exercised when drawing comparisons based on disposable income.

X.3 INDIVIDUAL AND HOUSEHOLD INCOMES

The focus of the second part of this Handbook is the income of the household, which is assumed to relate to the well-being of its members. For both practical and theoretical reasons this Handbook assumes the predominance of the household as the basic unit over which measurement takes place, though the previous chapter noted the limitations of the whole-household approach and the need for caution when using income indicators for this multi-person unit.

Here we turn briefly to the implications of the relationship between individual and household incomes for data systems and, in particular, the sort of indicators that are collected, while not strictly an issue of income definition, it is convenient to cover the matter here. The implementation of the collective approach to the analysis of the household enterprise, if this is to permit the recovery of individual behaviour and welfare levels, requires the collection of information about the private consumption of goods and time use. This information is crucial when the policy analyst is interested in gender issues or the well-being of children. Social accounting matrices, both at the household and society level, can maintain the gender or adult/children differentiation, thus permitting the analysis of intra-household distributive issues. The researcher responsible for the questionnaire design should therefore ensure that the information outlined in Box X.1 is included. On a practical level, the degree of detail and the recovery of incomes of individuals to which it gives rise can enable datasets to be linked where, for example, some are on an individual basis and other use the household as the basic unit.

BOX X.1
Recommendations to data systems for implementing a collective approach

The questionnaire design should provide for the following information to be collected:

Consumption spending and Labour

- Clothing for male, female and children, toys, school material and other education expenses, baby food, personal care items, alcohol, tobacco
- Individual specific time-use
- Off-farm work opportunities and wages

Income and wealth

- The sources of non-labour income should be assigned, when possible, to each household member.

Production

- Who does what in the farm and in the household, distinguishing, when possible, the activities undertaken by the father, mother, children, other adult members of the household and hired labour.

X.3.1 SHADOW WAGE AND THE NON OBSERVED ECONOMY

In conventional accounting systems, there is no explicit "wage" paid to the labour that the farmer and his family for their contribution to production. Yet the decisions made at household level on how to allocate labour to agriculture and other activities will reflect the implicit reward ("wage" or "income") in alternative uses and from using time for leisure.

The shadow evaluation of family labour can be estimated using three different approaches.

Accounting approach: the value of family income can be obtained as a residual, subtracting from net income the remuneration of all other factors of production. The remuneration of land can be taken as either its rental value or it can be imputed adopting an interest rate (typically greater than 2%). The cost of using owned operating capital could be evaluated by applying the prevailing rate in the credit market. Individual labour implicit wage income is then obtained by dividing the residual by the number of household labour units. Note that this criterion compensates both the physical and intellectual labor. Furthermore, labour is evaluated uniformly across working family members.

Objective market wage under competitive conditions: this approach evaluates an hour of household labour at the prevailing market wage supposing that the labor market is at a competitive equilibrium and the farmer is indifferent between working in the

farm and in the off-farm market. In this situation, the subjective evaluation (by the farmer) and the objective evaluation (from the market) of the opportunity cost of working inside or outside the household coincide. This "opportunity cost" approach may differentiate the contribution of the different working household members when accounting for the individual characteristics such as age, sex, education, and location of the farm as a proxy for off-farm market conditions within an econometric estimation (Huffman, 1996). The derived wage corresponds to the potential compensation that a farmer endowed with a specific level of skills could have potentially obtained if he/she had found off-farm employment.

Shadow wage: when labour markets are not competitive, as it is often the case in both OECD and developing countries, the family "unpaid" labour can be evaluated as the value of the marginal productivity of labour corresponding to the subjective evaluation of the disutility associated with an extra hour of work. This approach requires the estimation of a production or a cost function from which the marginal productivity can be evaluated. It is important to realize that the application of this approach implies the following assumptions:

Assumption 1) The farm-household economy is non-separable[4].

Assumption 2) Adult (and child) family labour are quasi-fixed factors in the short run.

The knowledge of **shadow wages** is fundamental in order to explain individual labour choices. Farmers decide to work on the farm by comparing the shadow wage with the market objective wage, when the subjective perception of the probability of finding a job, either in agriculture or in other sectors, and the objective probability of being hired are equal to 1. If subjective and objective probabilities diverge, then the proper wage comparison is between shadow wages and expected market wages which thus incorporates information about the probability of finding a job conditional on the level of education, age, experience and, more generally, skills of the farmers.

Shadow wages from agricultural activities can be estimated on an individual basis if data are collected about who does what in the farm. Still, the derivation of individual incomes incorporating also an assessment of the change in the household's net worth during the accounting period requires that non labour income is assigned to each household member given the knowledge of the rule governing the allocation of resources within the household. Note that the shadow wage approach is often the only one available when evaluating child labor.

In developing countries child labour may represent an important component of the input to the production of agricultural commodities and a source of income to the

[4]Under separability, the general equilibrium program of the household is recursive. Production decisions are not affected by the household's endowments, preferences, characteristics or decision processes. On the other hand, consumption decisions are affected by production choices since profits are part of the budget constraint. However, under non-separability implies jointness in decision making. This can happen when the same input, such as time, is shared across the household and home production processes, and in the presence of home consumption of the household marketable product. Under these conditions, farm production and household consumption decisions are non-separable and leisure/labour demand on the household is not independent from the on farm demand of family labour.

household as a whole. There may be a requirement to estimate the shadow wages of this child labour. This is a specialist issue that later versions of this Handbook may wish to develop.

X.4 VARIOUS INCOME CONCEPTS AND RELATIONSHIPS BETWEEN THEM

The accounting frameworks in which income measurement normally takes place, described in Chapter XIII, draw a somewhat arbitrary border around the items that are included. Flows from market activities are included, whereas non-market ones (including unpaid domestic work by household members) is not. This was also apparent from Figure X.1 (from Cecora, 1986) where it was clear that only some flows of resources towards households are measured. The definitions of income that are recommended in this Handbook do, for practical reasons, mainly respect conventional accounting boundaries. For agricultural households this flow of resources will come not only from independent (self-employed) activity on the farm, but also from other types of self-employment, from wages, from property (rents and interest) and in other money (or near-money) forms. Some imputed items are within the conventional boundary (especially the imputed rental value of owner-occupied dwellings). Various formulations of these flows are possible (for example, cash-flow, total household income, disposable income etc.). This will be dealt with later in this Chapter. Information about off-farm paid employment permits the derivation of total and disposable farm household income (Hill, 2000; Eurostat, 2002; OECD, 2003; Smeeding, 1997; Smeeding and Weinberg, 1998).

However, it is worth noting that other concepts of income exist that, in some circumstances, may be preferable.

X.4.1 EXTENDED AND FULL INCOMES[5]

The notion of extended and full incomes is important both to understand differences in family organization and to describe how households respond to policy changes by reallocating labour among the farm, the home, and the off-farm opportunities.

The family portfolio of labour choices includes not only gainful activities but also employment in domestic activities. This form of self-employment is valued at the "unpaid" equilibrium shadow wage, and, if a competitive environment is assumed, corresponds to the opportunity cost of time. The incorporation of this implicit source of income in the computation of household incomes gives the *extended* income (Lazear and Michael, 1988; Jenkins and O'Leary, 1996; International Research and Training Institute for the Advancement of Women [INSTRAW], 1996). The sum of extended income and the value of leisure time forms the Beckerian notion of *full* income (Becker, 1981).

According to Becker's (1965) definition of full income, there is no distinction between an hour spent on pure leisure and an hour spent looking for job opportunities. Jenkins and O'Leary (1996) suggest that this may be a problem if one considers the case of

[5]Section based on text supplied by Federico Perali.

involuntary unemployed people as well. As a consequence, most of the studies on full income restrict the estimation to extended income by setting the value of leisure to zero. However, because the members of farm households can allocate their working time with certainty on the farm, it is plausible to assume that there is no involuntary unemployment. Therefore, pure leisure of farm households can be taken as genuine leisure (Wales and Woodland, 1977). In view of the certainty of being able to work on one's own farm, the opportunity cost of time devoted to pure leisure can assumed to be equal to the implicit on-farm earnings. Jenkins and O'Leary (1996) stress that it is implausible to set the value of leisure time equal to the market wage rate.

Focus on a More Formal Approach to "Full Income"

X.4.2 THE IMPORTANCE OF TIME TO INCOME MEASUREMENT

Income is a flow concept rather than a stock. The notion of a time period over which income is received and measured is integral to the concept and is explicit in the Simons definition of personal income. However, there is no specific period over which income must be measured. By convention, a year is commonly taken as the relevant accounting period; this is not sacrosanct and there may well be other lengths of time which are more appropriate for particular circumstances. Importantly, it is unlikely that a detailed definition of income which is appropriate for one length of time will be equally appropriate for a shorter or longer period.

Looking back over a lifetime and assessing the personal income of a farmer, a full assessment of the personal income could take a very broad view. Not only would the income in cash and kind be covered, but also any capital gains or losses would need to be ascertained. This *ex post* view of income is related to the notion that consumers, in this case farmer-households, can have a longer-term expectation of their income, which would encompass all income forms, and on which their consumption pattern is determined - the "Life Cycle - Permanent Income Hypothesis" put forward by Freidman (1957). This is dealt with in greater detail in the following section. Here it is sufficient to note that, while little work has been done on the relationship between spending and perceived incomes of a longer-term nature in agriculture, evidence on the personal expenditure of farmers (using data from Denmark and Norway) referred to in Hill (2000), suggests that they do not substantially adjust their annual consumption to accommodate shifts in the profits generated by their farms, at least not within the same accounting period.

There are well-established empirical links for the population as a whole between age and income. Low yearly incomes are found particularly among the young and elderly, and higher levels somewhere in the middle. Farmers as a group tend to be relatively old compared with the rest of society. On an annual basis some of these older farmers would have a low income, but in former times their earnings may well have been substantial. Their present position might simply reflect changed priorities and the assurance of accumulated savings and other forms of wealth. In other words, their ability to consume may be quite adequate. Taking a longer view would reduce the inequality of incomes within the farming community. This is a conclusion applicable to many occupations but it is particularly appropriate in farming where quite large year-to-year variations are regarded as normal (Atkinson, 1975).

The longer is the period chosen, and the more disparate the groups for which comparison is required are, the broader the income concept needed for a satisfactory outcome. In the shorter term it may be appropriate to narrow the definition of income to suit the problems in hand. Much of the purpose for income policy, and therefore of income measurement, hinges on poverty (an issue tackled in more detail in Chapter XI). In this situation it may be satisfactory to put on one side those constituents of income that do not, in the short run, impinge significantly on the amount of cash a household has to meet its immediate needs. Thus capital gains and imputed rental values might be excluded.

Another aspect of time and income measurement, even when the conventional period of a year is used, concerns the way that transactions relate to the period in question. Financial years covering twelve months may, in principle, start at any point in the calendar, though surveys of accounts (such as the EU's Farm Accountancy Data Network - FADN/RICA) would clearly prefer their cases to share a common year-end (or a narrow band of year ends) as a wide spread makes interpretation more difficult. In agriculture, the production cycle has often led to a crop-year being used. However, adjusting across different crop-years to fit the calendar years used by national accounts can be a source of rather arbitrary year-on-year variation. Data for the different types of income received by agricultural households may not be available on a consistent basis. Perhaps more significant is the preference, both within the SNA for national accounts and the recommendations of the Canberra Group for microeconomic measurement, for income accounting to be undertaken on an **accrual** basis (that is, when payments become due) rather than on a **cash** basis (that is, when the payment actually arrives). The difference in results for a particular year can be quite significant. However, in practice it is likely that data on many items are only available on an actual receipts (and payments) basis and thus not in accord with the accruals rule. Estimates of both total income and disposable income are likely to contain both accrual based and cash based income and be unavoidably hybrid in nature, something that must be borne in mind when interpreting them.

X.4.3 LIFETIME INCOME AND PERMANENT INCOME HYPOTHESIS

While **life-cycle theory** centres more on the explanation of the relationship between age, saving and the creation of wealth, **permanent income theory** is more concerned with the dynamic behaviour of consumption, particularly in relation to average or expected incomes. In this framework, consumption is the annuity value of current financial and human wealth. The dynamic features of consumption captured by the Life-Cycle-Permanent Income hypotheses, framed within the economic theory of the household (Becker 1981; Kooreman and S. Wunderink, 1997), are very useful in understanding the trade-off between current and future benefits or costs, with a special emphasis on the cultural and socio-economic determinants of subjective discount rates.

The relatively stable consumption of farmers in the face of fluctuating incomes, noted in the previous section, can be expressed more formally within the Life Cycle-Permanent Income Hypothesis. This can be formulated as an observation that the farmers' marginal propensity to consume is high in relation to the level of permanent income and negligible in relation to the level of transitory income because individuals tend to smooth consumption uniformly during the life cycle. In other words, consumption

choices are based on the possibilities available according to the personal income stream and level of wealth expected over the whole life cycle.

In general, current consumption is affected by the personal rate of inter-temporal preferences (which leads to anticipated consumption when high), and the interest rate that can be earned from savings (which makes an individual more patient and less prone to consume today rather than tomorrow). The price of consumption tomorrow relative to consumption today is the discount factor, which can also vary subjectively according to the personal degree of impatience.

According to the life-cycle theory, saving behaviour and the evolution of the stock of assets depends on personal tastes, life-cycle needs and the value of lifetime resources, but is not determined by the temporal pattern of life-cycle labour income. If the income of a household comprising a young couple is low, but is anticipated to be higher later, it is not rational to stop higher consumption, because this is facilitated by the ability to borrow.

In general, the accumulation of savings is also strongly motivated by precautionary motives (both against ageing and uncertain prospects) and bequest motives (Deaton, 1992). Cautious households tend to save more in early life than would be predicted by the permanent income hypothesis. Economic uncertainty and unanticipated shocks affect the consumption plan of individuals differently depending upon the myopic or forward-looking attitude of consumers and the presence of liquidity constraints (Hall, 1978; Flavin, 1985; Zeldes, 1989). The more binding the borrowing restriction, the closer consumption follows the income path. Younger cohorts especially feel the stringency of this constraint when they are forced to limit borrowing designed to sustain current consumption even when they have the prospect of high future incomes.

For the life-cycle-permanent income hypothesis to work in **developing countries**, **credit markets** needs to be sufficiently developed and must function properly. Consumption credit is especially important where access to capital markets is rationed (Eswaran and Kotwal, 1989). The existence of credit rationing that is proportionate to the land endowment of the farm-household results in unequal access to the credit market. This fact explains why access to credit can be an important factor both in determining the levels of permanent incomes and in shaping the process of formation and differentiation of rural classes. These processes manifest themselves differently according to the economic, social and institutional situations specific to each society. For example, in societies where private property is a well-established institution but land redistribution is a central to agrarian reform, such as in many Latin America countries (including Peru, Nicaragua, Ecuador, Chile and Brazil), the differentiation of rural classes dominates the process that leads to the formation of new classes. On the other hand, in former socialist economies undergoing transition (many in Eastern Europe, Syria and Tanzania), the formation *ex novo* of rural classes is more likely to be observed. These aspects are not trivial, because for every class (characterized by specific combinations of wage incomes and wealth) there is a particular pattern of accumulation and formation of permanent incomes throughout the life-cycle and highly differentiated behaviour with respect to precautionary motives and liquidity constraints.

Under conditions of uncertainty and credit rationing, risk-averse farmers exposed to a high volatility of production and household incomes will need to smooth consumption through time, using consumption credit as a form of insurance to assure the sustainability of the household. They may also use this credit to invest in new technologies that promote the growth of both production and household incomes as a consequence of the fact that production and consumption decisions are not separable within a farm household. The poorest farm-households, experiencing difficulties in managing the farm and household risks because of lack of access to consumption credit and, consequently, to new technologies, are often forced to over-exploit local natural resources. These households are often compelled to move towards marginal lands with high ecological vulnerability or to extend the arable frontier at the expense of forest, causing land degradation and other ecological problems.

Interestingly, consumption can be "financed" both through the credit market and the labour market. In the latter case, this takes place through the "lending" of the farmers' time to take advantage of off-farm job opportunities. Since wealth influences the access to the credit market, this in turn affects the participation in the off-farm labour market and investments in the farming business (Serra *et al.*, 2003). Recent evidence shows that off-farm labour can be negatively associated with the accumulation of farm capital and the relative importance of farm incomes in the formation of the permanent income of the household (Ahituv and Kimhi, 2001). More educated farmers are able to work off the farm and still maintain a capital-intensive farm enterprise by enjoying easier access to the credit market.

X.5 SUBSIDIES, PREFERENTIAL TAX TREATMENTS, AND INCOME MEASURES

Agricultural households in OECD countries are the recipients of major amounts of what are commonly called "subsidies." These encompass both direct payments by the government (financed by taxpayers) and market interventions (involving transfers from consumers). In developing countries transfers may flow in the other direction. When assessing income it is important that these resource flows are adequately captured. Transfers in the form of monetary payments made direct to agricultural households, or where they are reflected in enhanced market prices of outputs and lowered costs of inputs, are reflected in the measures of income produced by conventional accounting systems. Where they take the form of concessions in direct taxation, these tax "expenditures" result in lower deductions and thus in the level of disposable income. There remains the possibility that benefits are given that fall outside the accounting system, and these may be important when attempting to compare the economic well-being of agricultural households with those of other socio-professional groups, or between farm households in different countries.

The internationally accepted System of National Accounts (SNA), which provides the conceptual framework for much of this Handbook, takes a somewhat narrow approach to what is considered to be a subsidy, and this is carried over to accounting for agricultural activity and for agricultural households. The SNA2008 defines subsidies (D.3), as "*current unrequited payments that government units, including non-resident government units, make to enterprises on the basis of the levels of their production*

activities or the quantities or values of the goods or services which they produce, sell or import" (the wording is identical in SNA93 para 7.71 and SNA2008 para 7.98). Payments linked to capital (such as grants to encourage investment) are not taken into account when measuring income in the household sector of national accounts, though they are in some microeconomic systems (such as the EU's FADN/RICA survey of farm businesses). The treatment of social benefits in kind provided free or at reduced costs to agricultural households (for example, special education for farm families) may not be satisfactorily identified or evaluated. While concessions on current taxation will be reflected in disposable income, special treatment on the taxation of transfers of agricultural land, particularly, between generations, may be important to the assessment of income measured over the longer-term but will not show up in current accounting and residual income indicators (OECD, 2004).

The measurement of income should take into account the possibility that elements of this type may exist, and consideration should be given to whether steps need to be taken to include them.

X.6 DEFINITIONS IN USE

In considering the definition of income to be used in analysing the income situation of agricultural households it is useful to review existing practice. Examples can be found at both the level of national accounts and at the microeconomic levels. The differences of approach towards accounting and income measurement result in differences in definition. This is well expressed in a passage from Section 2.2.1 of the Report and Recommendation by the **Canberra Expert Group** on Household Income Statistics (Canberra Group, 2001).

> *"The macro-analyst is interested in the aggregate of household income as it fits into the macro-economy as a whole, and approaches its construction in a top-down manner. Previous attempts to update the existing international guidelines on income distribution (UN, 1977) to bring them into line with the 1993 SNA have categorised income according to the type of transaction which gives rise to the flow without regard to the medium in which payment is made. The sequence is basically to measure first income generated in the course of production, then to allow for distribution of property income thus arriving at a concept called "primary income." The next stage is to account for current transfers, widely interpreted, and thus arrive at "disposable income." This is either spent on consumption or saved. Saving is used either to finance investment or leads to net borrowing or lending.*
>
> *Exhaustiveness of the definition is also very important to the macro-analyst, as is its consistency with the definitions of income of the other institutional sectors: no theoretical gaps can be left unfilled, even if in practical terms imputations and estimations have to be widely employed when actually compiling the statistics.*
>
> *The micro-analyst on the other hand is primarily interested in the measurement of income distribution. Conceptually, this means that the*

definitions are driven mainly by what the individual perceives to be an income receipt of direct benefit to him or herself, which results in a bottom-up approach to the construction of a definition. The means of payment is a major discriminatory factor and the rationale behind the payment is subsidiary. Practically, definitions have also to be constrained by what it is feasible to collect in household surveys or what is available at the household level in relevant administrative sources. In fact these two considerations – the conceptual and the practical – will usually result in the same choices, since if individuals perceive a receipt to be of direct benefit to them they are much more likely to be able to provide reliable data on it."

As part of its plan to harmonise methodology across the EU Member States, Eurostat developed the **Income of the Agricultural Households Sector (IAHS) statistics** (initially called Total Income of Agricultural Households (TIAH) statistics)**.** This provided a definition of income to be used when estimating the incomes of agricultural households (Eurostat, 1996). However, the definition was based on national accounts methodology and consequently contained some facets that are inappropriate when applied at the farm household level. In contrast, the methodology recommended by the Canberra Group for microeconomic work using household-level data is primarily intended for application in the study of income distribution, including poverty, and the emphasis is on income as a means of improving *current* economic wellbeing, as reflected in the ability "today" to consume goods and services. Resource flows that result in the ability to consume "tomorrow", such as employer contributions to pension funds, interest accumulated by these funds, and capital gains, are not usually seen by households as affecting their ability to consume "today" (indeed, they may be unaware of them) and are thus of less concern to microeconomic statisticians. Moreover the Canberra Group's income definition is not specifically designed to suit the rather special characteristics of agricultural households. Households whose principal income source is wages dominate the households sector in OECD countries in terms of numbers, and the Canberra Group's approach reflects this. In contrast, agricultural households by definition are involved with income from self-employment, heavily so when a narrow definition of what constitutes an agricultural household is adopted (see Chapter IX). Income in kind is particularly significant to farm households and, while being of special importance to farmers in developing countries, is by no means insignificant in richer countries, especially to those occupiers whose main purpose is orientated towards lifestyle or hobby agriculture. The subsistence production on private household plots of workers in large-scale agricultural enterprises in some of the countries with formerly collectivised (socialised) agriculture practices are another example of the importance of output for own consumption and income in kind.

The headings of the various items of Eurostat's IAHS definition of disposable income are shown in Box X.2. For a detailed treatment of each item, reference should be made to the TIAH/IAHS Manual of Methodology (Eurostat, 1996). An equivalent outline of the definition adopted by the Canberra Group in microeconomic (household level) studies is shown in Box X.3, slightly rearranged from the source document to ease comparison and to reflect the importance of income from independent activity (self-employment) in the present context. Detailed descriptions of the various components in this definition appear in Appendix 1 of the Canberra Group's report. It should be noted that some items appear in the IAHS definition under unexpected labels. A good example is where,

following the sequence of accounts for the households sector in national accounts, the resources from agricultural and other independent (self-employed) activity are shown as Operating Surplus (NVA less the costs of hired labour) rather than Entrepreneurial Income or profit from the unincorporated business (which also deducts rent and interest paid). In the strict national accounts/IAHS definition rents and interest are deducted under a later item (negative property income), which includes interest for private consumption loans as well as for agricultural purposes.

BOX X.2
Net Disposable Income in Eurostat's IAHS statistics

The concept which forms the centre of the IAHS sector-level income measure for agricultural households is **net disposable income**. It is defined as follows:

(1) Net operating surplus (mixed income)[6] from independent activity

- a) From agricultural activity
- b) From non-agricultural activity
- c) From imputed rental value of owner-occupied dwellings

(2) Compensation to members of agricultural households as employees, from agricultural and non-agricultural activity

(3) Property income received (rent, interest, dividends etc.)

(4) Non-life insurance claims (personal and material damage)

(5) Social benefits (other than Social benefits in kind)

(6) Miscellaneous inward current transfers

(7) Total resources (sum of 1 - 6)

(8) Property income paid

(9) Net non-life insurance premiums

(10) Current taxes on income and wealth

(11) Social contributions

(12) Miscellaneous outgoing current transfers

(13) Net disposable income (7 minus 8 - 12)

(14) Social transfers in kind

(15) Net adjusted disposable income (13 plus 14)

[6]Under the SNA (1993)/ESA (1995), operating surplus and mixed income are alternative names for the same balancing item. Mixed income is the term used in the context of unincorporated enterprises owned by members of households in which the owners or other members of their households may work without receiving any wage or salary. Though farms are usually of this form, here the term operating surplus is preferred; this is done to avoid potential confusion with and other microeconomic income concepts in which interest and rents have already been deducted.

BOX X.3
Definitions of income (microeconomic) by the Canberra Group (2001)

Income from self-employment

Cash or near cash

2.1 Profit/loss from unincorporated enterprise
2.2 Royalties

In-kind, imputed

2.3 Goods and services produced for barter, less cost of inputs
2.4 Goods produced for home consumption, less cost of inputs
2.5 Income less expenses from owner-occupied dwellings

1 Employee income

Cash or near cash

1.1 Cash wages and salaries
1.2 Tips and bonuses
1.3 Profit sharing including stock options
1.4 Severance and termination pay
1.5 Allowances payable for working in remote locations etc, where part of conditions of employment

Cash value of "fringe benefits"

1.6 Employers' social insurance contributions
1.7 Goods and services provided to employee as part of employment package

3 Rentals

3.1 Income less expenses from rentals, except rent of land

4 Property income

4.1 Interest received less interest paid
4.2 Dividends
4.3 Rent from land

5 Current transfers received

5.1 Social insurance benefits from employers' schemes
5.2 Social insurance benefits in cash from government schemes
5.3 Universal social assistance benefits in cash from government
5.4 Means-tested social assistance benefits in cash from government
5.5 Regular inter-household cash transfers received
5.6 Regular support received from non-profit making institutions such as charities

6 *Total income* *(sum of 1 to 5)*

7 Current transfers paid 2.4.3.1

7.1 Employers' social insurance contributions
7.2 Employees' social insurance contributions
7.3 Taxes on income
7.4 Regular taxes on wealth
7.5 Regular inter-household cash transfers
7.6 Regular cash transfers to charities

8 *Disposable income* *(6 less 7)*

9 Social transfers in kind (STIK) received

10 *Adjusted disposable income* *(8 plus 9)*

In contrast, the Canberra Group's microeconomic definition deducts such payments at an early stage to reach the profit/loss from the unincorporated business run by the household. Within this income from self-employment there are some non-cash elements identified separately in the microeconomic measure that are already subsumed in the aggregate approach in the calculation of operating surplus. The main examples of unexpected items in this current account are the receipt of (non-life) insurance claims as a resource and the payment of insurance premiums as a negative item. In microeconomic accounting the former (for example, compensation for the loss by fire of a tractor) would normally be placed among the capital accounts, and the cost of insurance premiums would be a deduction in reaching the profit (income) from the business operated by the self-employed person. Some sub-items (not apparent from the headings in IAHS definition) are included in the national accounting approach to maintain the integrity of inter-sectoral transfers; non-cash benefits imputed to holders of insurance policies because of the performance of invested funds are an example. Similarly some items in the miscellaneous transfers category (on both the positive and negative sides) contain elements that would be regarded in microeconomic accounting as payments out of disposable income rather than items to be deducted in its calculation. As already noted, the national accounting framework requires transfers from households to charities and other non-profit institutions such as churches to be seen as leaving the households sector, so leading to their treatment as negative items. A different view is taken in microeconomic accounting, where such payments may be deemed to be made out of disposable income rather than to be deducted when calculating it. A key issue seems to be the extent to which these payments are regarded as voluntary or non-voluntary. The latter might include trade union dues where membership is required (formally or *de facto*) in order to undertake a particular line of business.

Despite such differences there are broad similarities between the two in the general structure of what constitutes income, both in total and disposable forms. Both include cash (or near-cash) payments and non-cash elements. Non-cash elements pose difficulties of identification and valuation and, in particular, there is often a lack of suitable basic data by which quantification can take place. Both include the value of the services provided by owner-occupied dwellings, a particular example of a non-cash form of income. Both provide for two types of disposable income (unadjusted and adjusted). The adjustment factor is "social transfers in kind", such as education and health services that the state finances and provides free at the point of delivery to individuals and households.

Neither the IAHS nor microeconomic definitions are entirely suitable for practical use in their complete forms. Bearing in mind both the conceptual problems associated with some of the items and practical experience accumulated through the work of the Luxembourg Income Study (LIS), the Canberra Group recommends a somewhat simplified form of disposable income for use in studies of income distribution where different data sources are used and international comparisons are required (see Figure X.4). This simplified approach omits some of the imputed components and some that are of an ambiguous nature. In particular, it omits the value of Social Benefits in Kind (SBIK), and thus does not attempt to estimate an Adjusted Net Disposable Income. Imputed items are much reduced, including the removal of the value of owned dwellings. The list of miscellaneous transfers is much simplified, only retaining those benefits that are

obvious transfers from the state and those which constitute regular receipts from other households and charitable institutions. Among the payments, only those that are wholly or largely non-voluntary remain in the coverage; regular inter-household negative transfers are left out.

BOX X.4
Canberra Group recommended components of a simplified definition of disposable income

1 Employee income
- 1.1 Cash wages and salaries

2 Income from self-employment
- 2.1 Profit/loss from unincorporated enterprise

Imputed income from self-employment
- 2.4 Goods and services produced for barter, less cost of inputs *
- 2.5 Goods produced for home consumption, less cost of inputs *

3 Income less expenses from rentals, except rent of land **

4 Property income
- 4.1 Interest received less interest paid
- 4.2 Dividends

5 Current transfers received
- 5.1 Social insurance benefits from employers' schemes
- 5.2 Social insurance benefits in cash from government schemes
- 5.3 Universal social assistance benefits in cash from government
- 5.4 Means-tested social assistance benefits in cash from government
- 5.5 Regular inter-household cash transfers received

6 *Total income (sum of 1 to 5)*

7 Current transfers paid
- 7.2 Employees' social insurance contributions
- 7.3 Taxes on income

8 *Disposable income (6 less 7)*

* Not included in LIS DPI
** Included in property income in LIS DPI

Source: Canberra Group (2001). Table 4.1.

This Canberra Group's simplified list forms a useful template for use when estimating the income of agricultural households. Most of the simplifications are helpful when applied to agricultural households as a subsector. For example, experience in Eurostat's IAHS statistics suggests that very few countries are able to estimate SBIK for agricultural households other than by distributing the aggregate for the entire households sector in a rather arbitrary way, such as per head, something for which there is little empirical support. The removal of many inter-sectoral transfers accord with what many Member States did when supplying IAHS results to Eurostat. So too is the reduction of items in the miscellaneous inward transfers category to state payments and other regular transfers. Nevertheless, **certain modifications to the Canberra Group's simplified definition seem appropriate to suit the special circumstances found in agriculture**. A revised definition is proposed in Box X.4. The main differences are shown in *italics*. However, where the amplification is simply a disaggregation of a total, this is not flagged.

Two changes to the Canberra Group's simplified list are introduced. The first relates to the inclusion of an **imputed rental value of the farm dwelling** (and equivalent treatments of the dwellings of other socio-professional groups if comparisons are to be made). The reasons for including this item are that (a) empirical evidence shows that it can be important in some countries to the overall level of income; (b) in some farm accounts surveys provision already exists for its calculation, so many countries will already have experience in making the estimates; (c) most EU Member States made calculations as part of their submissions of IAHS results to Eurostat. The second change is a more specific mention of the **value of income in kind from self-employment**. It should be noted that income in kind from *employment* is not covered; only cash income is included in the form of wages and salaries. The fact that some countries may find it difficult to provide data for one or other of these items is a handicap but not an insurmountable one. The Canberra Group notes that, as long as items are detailed separately, it is possible to make comparisons between countries or sub-sectors by omitting items for which there is poor coverage.

A third change was considered but has not been implemented. This was the deduction in reaching net disposable income of other regular negative transfers (in addition to taxes and social contributions) by the members of agricultural households as self-employed people or as employees of other businesses. This mirrored the treatment of regular outward transfers and maintains a degree of symmetry. However, this item was ruled out because of impracticality over identification and measurement.

This Handbook recognises the simplified definition of Disposable Income shown in Box X.5 for application to income measurement of agricultural households. When presenting results, information should be available for the separate items shown in this definition.

BOX X.5
Recommended definition of net disposable income for application to agricultural households

Net income from self-employment (money income and in kind)

Net income from self-employment (operation of unincorporated businesses, or incorporated businesses that can be treated as *quasi* unincorporated because of family operation and ownership) after deduction of intermediate consumption items, interest on business loans, rents on land and business property, and a depreciation allowance for capital consumption. This will include net profit or loss in money form and the value of other income in kind, such as the value of output used for barter and for own-consumption, net of cost of inputs used in their production.

Of which:

(a) self-employment in agriculture (money income and in kind)
(b) self-employment in other industries (money income and in kind)
(c) imputed rental value of owned dwelling

+ Cash wages and salaries, earned from dependent activity in enterprises (institutional units) that may be agricultural or non-agricultural in nature

(= Primary income)

+ Rent received

(a) net rents from the letting of property other than land
(b) net rents from the letting of land

+ Other property income

(a) net interest received (interest received less interest paid, though payments should not include interest already deducted in calculating profits)
(b) dividends received

+ Social transfers received

(a) Social insurance benefits from employers' schemes
(b) Social insurance benefits in cash from government schemes
(c) Universal social assistance benefits in cash from government
(d) Means-tested social assistance benefits in cash from government

+ Other current inflows

Regular inter-household cash transfers received such as transfers from relatives living and working abroad)

= TOTAL INCOME

- **Current taxes on income and wealth**

- **Non-discretionary social contributions (payments to social security schemes)**

a) by members of agricultural households as self-employed person
b) employee social contributions (only) relating to income from employment

= **NET DISPOSABLE INCOME** (note: this is not adjusted for the receipt of social benefits in kind)

In developing countries, there are a number of both practical and theoretical issues to take into account when measuring the income of households that generate at least part of their livelihoods from agriculture. The problems are particularly acute for those households that undertake agricultural activities with the main purpose of providing their household members with food and other necessities. Typically, these households practice a low-input, low-output form of agriculture where the main input to production, other than land, is family labour and where much if not all of the output is consumed and does not enter the market. In low income countries the number of these types of household are substantial and they are typically much more likely to be poor and food insecure. Since they are of major interest to policy makers, from both production and welfare points of view, measuring income and analyzing how it responds to policy is particularly important.

In most low income countries, however, the measurement of income following the guidelines and recommendations of the Canberra Group is difficult, time-consuming and expensive and is often beyond the capacity of national statistical system, even when external technical and financial assistance is available. Most households do not keep accurate records of their financial inflows and outflows and do not have the capacity to measure either financial or physical quantities in standard units. Smallholder agricultural activity is usually outside the scope of the tax system and there is little or no requirement to document transactions. At the same time, income in both cash and in kind, is infrequent, depending on the timing of agricultural seasons, and is highly variable, depending on external conditions such as rainfall as well as markets.

All this means that, in practice, measuring income directly from many agricultural households in developing countries is difficult and expensive and the resulting data are often of low quality. Practical experience, therefore as well as some theoretical considerations, have led to approaches based on the measurement of total household expenditure or consumption to provide a measure of well-being or welfare of households and individuals in developing countries (Deaton, 1997).

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FOCUS PIECES – CHAPTER X

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Focus on Farm Accounting Standards in OECD Countries

The Core Text of Chapter X mentions the International Financial Reporting Standards (IFRS) and its specific standard for agriculture (IAS 41[1]) that has become increasingly influential since it was established in 2003. The IFRS are potentially a very useful way to standardize income calculations within agriculture but also between agriculture and other sectors. One of the features that is unique for IAS 41 is that the change in value of all biological (living) assets should be included in income.

However, the IFS has been predated by some forty years in the EU by the Farm Accountancy Data Network (FADN/RICA) and its associated accounting methodology, developed by the European Commission, in association with Member States. Evolving since the mid-1960s, its details are now readily available[2]. As the harmonized basis for microeconomic accounting for farming, including income indicators, in 27 European countries, FADN is influential in any international system of farm household income measurement. The EU FADN methodology is very similar to the IFRS in many respects, including the valuation at current value (or fair value) for nearly all assets. The equivalent survey in the United States (the Agricultural Resource Management Survey – see Chapter XII, section XII.3) uses a similar approach, though the labels of income indicators differ. A worldwide research network (PACIOLI[3]) has developed that meets on a yearly basis and exchanges views on all kind of innovations on accounting networks including methodological issues.

The FADN methodology includes a list of the items that lead to various income indicators, of which Farm Family Income is the most relevant in the present context; it describes the residual as "remuneration to fixed factors of production of the family (work, land and capital) and remuneration to the entrepreneur's risks (loss/profit) in the accounting year" (European Commission, 2002). Family Farm Income is similar to (but not identical with) the Entrepreneurial Income of the SNA.

While in some EU countries special surveys of farm accounts form the basis for making contributions to the EU FADN, in others data are taken from fiscal accounts (those submitted for purposes of taxation). The treatment of capital consumption (depreciation) and other conventions used in the measurement of business profits for the purpose of taxation may well differ from those that would be needed in networks for economic measurement like FADN. Although accounting on an accrual basis may be the norm, some tax systems allow farmers to calculate their incomes on a cash basis (OECD, 2005). For the purpose of reporting to FADN, data from fiscal accounts are transformed in ways that is more relevant for economic analysis (for example by using prices indices to recalculate historical values into current values).

A quite fundamental issue is the use of historical values or current values for the calculations of costs of using assets. Lewis et al (1980) and Boone et al (1997) state that the cost of fixed assets should be based on the replacement value. If the profit of a farm

[1](www.iasplus.com/standard/ias41.htm)

[2]http://europa.eu.int/comm/agriculture/rica/index_en.cfm

[3]www.Pacioli.org includes all papers presented at the workshops

during times of high inflation is based on the historical expenditure and the profit is used up for paying tax and private expenses, the farm would not have enough resources to buy the same fixed asset again because inflation would make it more expensive. The farm would then not have the money to continue its business. If the profit is calculated on a current cost base, the company would have just enough resources to buy the new asset again. Another advantage of current cost accounting is that it is well suited to inter-business comparisons. The cost of two farms who have exactly the same asset (of the same age), but who did not buy the asset at the same time (one farmer bought it second hand), and hence their historical expenditures are different, will be calculated in the same way. The original price they paid for the asset is irrelevant for comparing the costs of the farms (an other economic analysis). Although from a theoretical viewpoint the current cost accounting has important advantages, the practical implications can be rather complicated. Each year a replacement value has to be calculated for every fixed asset. This is especially complicated for assets which change hands only seldom or never. This could be the case for old assets, but also for assets for which there has been a technical breakthrough. For these assets, and often for efficiency reasons also for other assets, rules of thumb are used to calculate the replacement value. These calculated replacement values can be very different from the real replacement values. Apart from that, each country may use different rules of thumb, a process which distorts the comparisons between countries and introduces a subjective element into the calculations

Fiscal accounting is in nearly all countries based on historical costs for most assets (rather than the economically-preferable alternative). The main reason for this is that historical costs are more objective to calculate and less sensitive to fraud than current values. The calculation of the historical costs of biological (living) assets that are produced on the farm is highly complicated. Therefore in most countries (even in fiscal accounting) norms are sets by fiscal authorities to value biological assets. These norms might be based on an estimation of costs or on current value.

Each country has its own regulation on how the economic profit should be calculated for fiscal purposes, but international harmonization is progressing.

Other methodological issues that differ between different accounting systems are:

- Depreciation periods for fixed assets
- Valuation and depreciation of intangible assets (like tradable quota, entitlement for subsidy payments)
- Valuation of agricultural produce (harvested products)
- Matching of outputs and costs to the relevant years (for example subsidies, crops still on the land etc.)
- Value added tax
- The inclusion of other entrepreneurial activities that might or might not be related to agricultural production (like tourism, forestry, shop)

These issues are also an important reason for differences between income calculations based on macro data (like indicators derived from the Economic Accounts for Agriculture – EAA) and micro data.

FOCUS PIECES

Boone, J.A. & Wisman, J.H. (1997). *Cost prices in pig production: Experiences with an EU-wide comparison*. Paper for the 48th meeting of the EAAP, Vienna, august 1997 and in: Pig news and information, 1998 vol. 19 no.1, 19-28.

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Focus on a More Formal Approach to "Full Income"[1]

From both a behavioral and a policy point of view, it is relevant to take into formal consideration that decisions made by the household unit are conditional on the information sets related to both the production and consumption side of the household economy. What is often neglected is that the production side of the household economy consists of both farming and domestic activities. Both the extended and full income definitions explicitly recognize the contribution of home activities to the formation of household resources. Farm and "home produced" incomes are traditionally pooled within the family. In order to derive individual incomes, these sources of income are assigned to each worker in proportion to the amount of contributed labor. Estimates can then be made of the relative contribution of the husband and wife to the paid and unpaid sources of household income and to undertake a gender-specific analysis of the income distributions.

The implementation of the Beckerian notion of full income requires evaluating the time endowment, which is employed in both paid and unpaid working activities and leisure, and measuring non-labour incomes derived from returns on non-farm assets and/or pensions. The accomplishment of this task requires the derivation of total farm household and extended incomes along with the evaluation of leisure time. Both farming and home production are family enterprises, the difference being that farm output is marketable, while domestic output, often composed of public components, is sold within the household at an implicit price.

Each member (i) of a farm household of size N can allocate its time endowment among the following activities: $T = \left(f_i + o_i + h_i + l_i \right) + I_i = d_i + I_i$, where f_i is hours of time devoted to farm labour activities; o_i is time devoted to off-farm labour either in agriculture or in other sectors (paid at the market wage) and commuting time; h_i is time devoted to unpaid home production activities; l_i is time devoted to pure leisure, such as recreational activities; I_i is time devoted to rest and personal care. The amount of disposable time is $d_i = f_i + o_i + h_i + l_i$.

Traditionally, economists define "unpaid work" as the time spent at home doing housework and producing goods and services for the family. Similarly, for farm households, farm labor supplied by household members is not directly paid to farm operators. Farmers remunerate themselves at an implicit wage. The time contributed by farm operators is often referred to as unpaid farm labor (Huffman 1996). Both farm labor (f_i) and domestic work (h_i) are defined as unpaid work. The availability of individual time-use data permits separating the time devoted to domestic work from the time allocated to pure leisure.

As summarized in the following formula, total farm household income (y^m) is the sum of farm, off-farm, non-labour income and social transfers of the N household members:

[1]Contribution by Federico Perali (University of Verona, Italy) to the 2005 edition of the Handbook, where it formed Annex 7.

$$y^m = \sum_{i=1}^{N} w_i^f f_i + \sum_{i=1}^{N} w_i^o o_i + \sum_{i=1}^{N} y_i^{nl} + y^{tr} =$$
$$= \sum_{i=1}^{N} y_i^f + \sum_{i=1}^{N} y_i^o + \sum_{i=1}^{N} y_i^{nl} + y^{tr} =$$
$$= y^f + y^o + y^{nl} + y^{tr},$$

where w_i^f is the gender specific implicit farm wage; w_i^o is the exogenous market wage of individual *i*; y_i^{nl} is individual non-labor income derived from non-farm assets and property income; y^{tr} is social transfers and other money incomes, such as universal benefits and social insurance (non means tested) transfers (child allowances, social security or retirement, disability insurance, unemployment compensation, workers' injuries compensation), cash mean-tested welfare payments, inter-household transfers (e.g., inheritances, alimony and child support paid and received, or other forms of intermittent income in cash or in kind, such as child care by relatives).

Disposable farm-household income is obtained by deducting from total farm-household income, including the value of self-consumption (y^a) "sold" by the farm to the household, the value of farm, personal taxes, and social contributions *t*,

$$y^n = \left(y^m + y^a\right) - t$$

Gross or net extended income (y^e) is derived by adding the valuation of domestic activities (y^h) to either y^m or y^n respectively. Similarly, for pre- or post-tax full income,

$$y^F = y^e + y^l,$$

which requires the valuation of leisure (y^l).

The way in which the various forms of income relate to each other is shown in Focus Table X.1 below.

FOCUS PIECES

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FOCUS TABLE X.1
Definition of Total Farm Household Extended and Full Income and Evaluation Methods

	INCOME	EVALUATION METHODS
1. Total farm household income - $y^m = y^f + y^o + y^{nl} + y^{tr}$		
a. Net (pre-tax) operating income i. From farm self-employment ii. From imputed rent for owner-occupied dwellings	**Farm Income -** y^f	• **Accounting** • **Market - Opportunity Cost** • **Shadow Wage**
b. Money wage or salary income as *dependent* employees from off-farm i. Agricultural and/or ii. Non-agricultural activities and/or	**Off-Farm Income -** y^o	• **Market Wage**
c. Net income from non-farm self-employment as *independent operators*		• **As for 1.a**
Other cash market income (e.g., interests, dividends, rents, private pensions) **d.** Social Transfers or Other Money Income	**Non-labor income -** y^{nl} **Social transfers -** y^{tr}	
2. In Kind earnings *(Home own-consumption)*	y^a	• **Market Price**
3. Taxes and contributions – *t* **a.** Property income paid - (Farm Business Tax) **b.** Net direct and payroll taxes - (Off-farm personal tax) **c.** Social Contributions	**Disposable Farm Household Income -** y^n $y^n = \left(y^m + y^a\right) - t$	
4. Value of domestic production - y^h (e.g., food preparation, household chores, child care, etc.)	**Extended Income -** y^e $y^e = y^n + y^h$	• **Market or Opportunity Cost Approach** • **Shadow Wage**
5. Value of leisure - y^l (e.g., recreational activities, entertainment)	**Full Income -** y^F $y^F = y^e + y^l$	• **Market or Shadow Wage**

Kanbur, Ravi, and Diganta Mukherjee, Premature Mortality and Poverty Measurement (March 2003)

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Laderchi, Caterina Ruggeri, Ruhi Saith and Frances Stewart, Everyone agrees we need poverty reduction, but not what this means: does this matter? (May 2003)

United Nations Development Programme (UNDP), United Nations Economic Commission for Latin America and the Caribbean (UNECLAC), Brazilian Institute for Applied Economic Research, Meeting the Millennium Poverty Reduction Targets in Latin America and the Caribbean, 2002). English, Spanish.

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United Nations Statistics Division (UNSD), Millennium.un.org, Target 1. Eradicate extreme poverty and hunger (2003). *English*, French)

World Bank, Distribution of income or consumption (World Development Indicators, 2002)

World Bank, Population below national and international poverty lines and poverty gap (World Development Indicators, 2003)

The text of the first chapter of the Handbook on Poverty Measurement Analysis is a recommended reading on this subject (Link to relevant Extended Reference)

CHAPTER XI

INCOME LEVELS, DISTRIBUTION, POVERTY AND WELL-BEING

XI.1 POVERTY AND WELL-BEING

According to the World Development Report 2000/2001 (World Bank, 2000), "poverty is pronounced deprivation in well-being". Understanding who is poor, why they are deprived and what can be done to improve well-being is a major concern for policy in all countries, but especially those where levels of development are lower and where the incidence of poverty is much greater. Amartya Sen, the Nobel Laureate who, perhaps, has contributed most to thinking about poverty and deprivation, argues that well-being comes from a capability to function in society (Sen, 1987). Thus, poverty arises when people lack important capabilities, for example because they have insufficient income, inadequate education and poor health, or suffer from insecurity, a sense of powerlessness and an absence of rights such as freedom of speech. In this sense, poverty is clearly a multi-dimensional problem, requiring policy actions in a wide variety of areas. The level of income, or the ability of people to have control of sufficient resources to meet their needs, is an important component of poverty, but not necessarily the only concern. Measures to increase the income of the poor, therefore, need to be accompanied by other actions to ensure access to health and education, to ensure security and to ensure that people are able to make their needs known.

Since the publication of WDR 2000 and especially since the Millennium Summit that established the Millennium Development Goals, thinking about poverty and about how to measure it has developed considerably. The first MDG aims "to eradicate extreme poverty and hunger" and the first target is to "halve, between 1990 and 2015, the proportion of people whose income is less than $1 per day". This focus on income as the main measure of poverty has placed a much increased emphasis on the measurement of income and the identification of poverty lines; it has also resulted in a major effort in many countries to develop robust measurement methods. In developing countries this effort has been led by the World Bank, which has responsibility, within the international

statistical system, for compiling the global data on the poverty related indicators for MDG1. As a result, the availability of data has improved considerably and by June 2010, the UN Statistical Division was reporting that 92 out of 163 developing countries had at least one data point for the first poverty indicator and 70, or almost 43 per cent, had at least two.

As data coverage for the first MDG has improved, however, and as the analysis of trends in income poverty has developed, many commentators and politicians have returned to the issue of the multi-dimensional nature of poverty. In part this has been addressed by the other MDGs, focusing on issues of education, gender equality, child mortality, maternal health, the impact of disease and environmental sustainability. At the same time, there has been an interest in the compilation of indicators that include aspects of poverty beyond just income. At the global level, initiatives such as the Human Development Index, compiled and published by the United Nations Development Program, measures development in an index that incorporates measures relating to the health and education of the population as well as its income.

The literature on poverty in all its aspects and on its measurement is vast and expanding. Among developed countries the statistical work is led by OECD and Eurostat; in developing countries many agencies are working on poverty, its measurement and its analysis, with the World Bank and the UN system generally prominent. This handbook, with its focus on rural development and the income of agricultural households, has a clear interest in presenting information on the collection, compilation and use of statistics that provide information on poverty and deprivation. In the space available to us, however, it is not possible to provide an exhaustive review. Our aim, therefore, is rather to highlight some of the main issues and concerns associated with the measurement of poverty and well being of agricultural households and to provide a brief guide to the most important parts of the literature. In the rest of this chapter we discuss first of all income poverty and then look briefly at some of the other aspects of well-being. As is the case in all the other chapters, the main text tries to cover the principal issues that are relevant to all countries. More specialized coverage focusing on the specific problems faced in developed and developing countries are provided in the links, and a summary of the main literature is set out in the bibliography.

A major reason for requiring statistics on the income of agricultural households is to explore whether there is a problem that requires government intervention. Particular attention is paid within policy planning circles to the problems associated with low incomes. In less developed countries this may manifest itself in a lack of ability to meet basic needs (food, shelter etc.). In more developed economies these needs may be met, but there may still be disparities between groups that raise concern on the grounds of equity; low-income households could still be regarded as suffering deprivation. What is meant by the term deprivation depends on the context (Bradley *et al.*, 1986), but it is, nevertheless, a potent concept in justifying policy action. Within the agricultural sector of industrialised countries it is commonly found that various forms of deprivation are connected - an inadequate income will tend to be associated with isolation on a small farm, where the family is locked into a restricted set of social contacts and has only a narrow range of access to the facilities provided for society in general. The problem is therefore multi-faceted. Nevertheless, these additional forms of deprivation are conceptually separate from (but may be linked to) what can be described as economic

deprivation or income poverty. Economic deprivation may be described as situations where people have an insufficient command over the resources needed for living and are excluded from the socio-economic system.

XI.2 MEASURING INCOME POVERTY

A substantial literature exists on the theoretical and practical issues encountered in income poverty measurement, both for OECD countries and for developing countries. In 2003 the UN Statistics Commission launched a project to produce a *Handbook on Poverty Statistics: Concepts, Methods and Policy Use* which was published in 2005 (UNSD, 2005). The World Bank has also published very useful material on the practical issues concerned with the measurement of poverty and inequality in developing countries (Haughton and Khandker, 2009). This chapter focuses primarily on the general principles that apply to both groups of countries; for specific applications relevant to the separate conditions in OECD and developing countries readers are encouraged to refer to the more specific material provided in the linked sections.

In order to turn an imprecise notion that some people have an inadequate income with which to meet their needs, into a measure which can be used to guide practical policy, some standards have to be set for what is deemed adequate. The most widespread way of doing this is to define a *poverty line.* This has two distinct roles (Ravallion, 1998). One is to determine what the minimum level of living is before a person is no longer deemed to be "poor". The other is to make comparisons between families in order to inform observers of what expenditures are needed in each set of circumstances to ensure that the minimum level of living needed to escape poverty is reached. It is possible to establish a poverty level in terms of a combination of characteristics. An example would be income plus leisure where two people of identical income might be classified differently if one has more leisure time than the other. In this situation the term *poverty boundary* is more appropriate than poverty line. However, it is more usual to simplify the relevant variables to one - that of income. When tackling low incomes in agriculture, a monetary poverty line is a very useful yardstick against which the circumstances of agricultural households, families or individuals can be compared.

XI.2.1 DEFINING POVERTY LINES

Of course, poverty is associated with one end of the income distribution. The distribution of incomes is important because an otherwise satisfactory level of average or median income can nevertheless contain cases where incomes are sufficiently low as to constitute a policy problem. Thus when considering poverty among households it is necessary to put this in the more general context of the distribution of incomes. The Canberra Group report (2001), which is a major foundation of the methodology outlined in this Handbook, is quite reticent in its treatment of how income distributions should be described, lacking a specific section dealing with them as a tool in economic and social analysis. However, before dealing with the distribution of incomes it is first necessary to set out the basis on which poverty lines might be established. Later some of the practical issues in the application of poverty lines will be described.

Poverty lines are by their nature impossible to set without involving value judgements. These may be explicit or hidden in the assumptions behind what may appear to be

objective methodologies. A variety of approaches to defining a poverty line have been used or proposed. Two polar positions can be taken. The first assumes that the poverty line can be set in absolute terms, in which case it would be possible to totally eliminate poverty if everyone could be lifted above the poverty line. The second position assumes that poverty is a relative phenomenon, in which case poverty will never be completely removed (Hagenaars and Van Praag, 1985; Hagenaars *et al*, 1994; Ravallion, 1998).

At its most extreme, an absolutist view of poverty would be a situation of deprivation of certain basic goods and services necessary for maintaining physical subsistence. This makes no reference to the well-being of the rest of society. In these circumstances, a poverty line would correspond to the income required to allow the acquisition of these basic means. This was basically the approach of the seminal work on UK poverty by Rowntree (1901) and Booth (1902). It is particularly suited to the circumstances of less developed countries and is widely used in these circumstances. Of course, if income (rather than consumption) is used as the criterion on which the line is drawn, then it becomes important to ensure that income is adequately measured, especially income taken in kind from own-production of food and other domestic requirements.

A less rigid attitude might set a poverty line somewhat above this subsistence-consumption level. This higher level will reflect society's view of what constitutes a minimum acceptable income for its members. Both are absolute figures, though in the latter case the level takes into account more than physical necessities. As Atkinson (1975) points out: "It is misleading to suggest that poverty may be seen in terms of an absolute standard which may be applied to all countries and at all times, independent of the social structure and level of development. A poverty line is necessarily defined in relation to social conventions and the contemporary living standards of a particular society". Though a subsistence poverty line may have the appearance of objectivity, the *choice* of defining poverty in this way is as subjective as any other based on less clear physical requirements (see also Atkinson, 1980).

The other extreme in poverty line definitions is represented by those which set the line at some percentage of the society's average personal or household income, or at some point in the distribution of incomes, for example, at some percentage of the median income or the lowest decile. Expressed in such a way, poverty will never be eliminated. But this too imposes the judgement of the observer on the measure of poverty. In an attempt to strive for greater objectivity, exercises have been conducted to extract from a representative cross-section of people, using surveys, society's assessment of where the poverty line lies (Hagenaars and Van Praag, 1985).

While different respondents perceive poverty differently according to their circumstances, suitable weighting can be employed to achieve poverty levels that reflect the mix of views in society. This has been termed a "subjective" view of poverty (Forster, 1994), and constitutes a third approach for establishing poverty lines. However, adopting a poverty line derived in this way presupposes that society in general is the best assessor of poverty; this is not self-evident. Table XI.1 summarises the three approaches to establishing poverty lines.

TABLE XI.1
Three different approaches to defining low income (poverty lines implied)

	ABSOLUTE APPROACH	RELATIVE APPROACH	SUBJECTIVE APPROACH
METHOD	Define an absolute subsistence minimum in terms of basic needs. The aggregate cost constitutes the low income line	Define low income as a fraction of average or median income (e.g. 50% of median)	Incorporate a minimum income question in household surveys
EXAMPLES	US Social Security Administration Poverty Index	International comparative studies often use this method	Very few regular surveys adopt this approach
ADVANTAGES	Permit analysts to quantify easily the effects of social programmes	Allow cross-country comparisons because of its independence of a specific country's definition of basic needs	Can avoid the problem of the arbitrary choice of basic needs
DIFFICULTIES	Arbitrary nature of the choice as to what constitute basic needs Difficulty in cross-country comparisons	Relationship between low income and poverty is less clear	Cross-country comparison is extremely difficult

Source: Forster (1994), *pp.7-10 cited in OECD (2001).*

In OECD countries, poverty lines, despite the attractions they might hold for use in agricultural policy that is directed at improving the economic situation of poor farmers and economically disadvantaged rural residents, have rarely been applied as a major statistical tool. Nevertheless studies show the importance to the assessment of the income measure chosen. For example, in the US broadening the concept of income to include items such as unrealised capital gains can transform the numbers of farm households deemed to be in poverty.

Poverty lines are only one way of casting light on income distributions and low incomes among agricultural households. An array of statistical tools can be used. Some of the principle ones are outlined in general terms below. Readers concerned with their use in the contexts of agricultural households in OECD countries and in developing countries are referred to the links to specific supporting material.

The OECD material is based on a study (OECD, 2001) that outlined ways of measuring poverty among agricultural households in its Member countries is based on international practice. It used evidence from the Luxembourg Income Study (LIS) database for the mid-1990s to compare the degree of "low-income" in agricultural households to other households in the different countries.

Focus on Low Incomes among Agricultural Households in OECD Countries

For developing countries the UN Statistics Division has had a project, launched in 2003, to produce a *Handbook on Poverty Statistics: Concepts, Methods and Policy Use.* The overall objective of the project is to assist policy-makers and statisticians in member countries to face the growing demand for poverty statistics and related information by building up a system of poverty measurement which is responsive to national and international data needs. In particular, the project aimed to share experience in the collection and analysis of poverty statistics across different regions, provide countries with an overview over the extensive literature on poverty and put forward the options available at the country level. Furthermore, it aimed to provide some practical guidance for the compilation and reporting of poverty data. The complementarity of this *Handbook on Poverty Statistics* and the current Handbook on rural statistics and agricultural household income statistics is obvious. Consequently the material provided here on poverty measurement and income distributions draws heavily on the Handbook and some other sources.

Focus on Poverty in Developing Countries
Extended reference on Poverty Analysis in Developing Countries

Notwithstanding the more specialised material provided by these links it is useful to have some mention here of the main statistical tools that can be used in measuring income distributions, especially as they are applied to poverty among agricultural households.

XI.2.2 POVERTY INDEXES

A poverty index is a single measure that summarises information about the poor as a component of some population. Sen, in a seminal article in Econometrica, (Sen, 1976) identifies the desirable properties that a good poverty index should have. He suggested that any index should reflect the relative number of the poor, that is should indicate the extent of their deprivation and that it should also provide information about the distribution of income among the poor, or their relative deprivation. Hagenaars (1987) reviews a number of desirable axiomatic requirements of an index that have been identified in the literature, although no index so far proposed meets all the seven axioms simultaneously and some judgement may be required to determine which of the axioms are most important in any specific circumstance.

The six main axioms that have been proposed for poverty indexes are as follows.

1. **Monotonicity** – where an increase in the income of a poor person should decrease the poverty index and vice-versa.
2. **Transfer axiom** – where a transfer from a rich to a poor person should decrease the index and vice-versa.
3. **Population symmetry** – where if two populations that are identical are pooled, then the value of the poverty index should not change.
4. **Proportion axiom** – where an increase in the proportion of poor people in a population should result in an increase in the index.
5. **Focus axiom** –where changes in the income of people above the poverty line should not change the value of the index.

6. **Decomposability** – where the index can be decomposed to calculate poverty in sub-groups and changes in the poverty of a sub-group affects the overall index if all other factors remain the same.

Foster, Greer and Thorbecke (1984) have proposed a class of additively decomposable poverty indexes that have now come to be widely used, especially in developing countries. The class of indexes is defined as:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{q=z}\left[\frac{z - x_i}{z}\right]^\alpha \quad for\ (\alpha \geq 0)$$

Where N is the number of people in the population, the summation is over all people with an income below the poverty line z and x_i is the income of the ith person below the poverty line. The parameter α reflects the weight to be given to the extent of poverty of each individual below the poverty line and can be termed a poverty aversion parameter. It should be noted that z can be defined as either an absolute or a relative poverty line.

Different values of the parameter α generate different indexes. P_0 where α is set as 0 is simply the poverty headcount ratio, or what is sometimes referred to as the low-income rate. This is the proportion of the population whose income is less than the poverty line. This is a simple concept, is easy to calculate and is widely used. For example, the proportion of people living below an international poverty line of about US$1 per day, calculated in purchasing power parities (PPP) is one the main indicators used to monitor progress towards the first Millennium Development Goal (MDG) of eradicating extreme poverty and hunger. The proportion of people who are classified as poor, is a simple concept that is widely understood and this index, therefore, is used in many countries to monitor progress towards poverty reduction.

The poverty headcount ratio, however, does have a number of drawbacks as a poverty index. For example, it does not follow the monotonicity axiom. An increase in the income of a poor person, provided it does not take them above the poverty line, will have no affect on the index. At the same time, a policy that transfers income to those households whose incomes are just below the poverty line will result in a reduction in poverty even though overall welfare and especially the well-being of the poorest may not have changed much at all.

For this reason, the indicator P_1 is also quite widely used. This is the average poverty gap in the population (where the non-poor have a zero income gap), that is, the mean amount of income, as a proportion of the poverty line, that would need to be transferred directly to the poor in order to eliminate poverty.

Then poverty gap (P_0) is calculated as:

$$P_1 = \frac{1}{N}\sum_{i=1}^{q=z}\left[\frac{z - x_i}{z}\right]$$

The poverty gap ratio is also quite widely used and has an intuitive meaning. It is also used as another indicator for MDG 1, based on the $1 per day poverty line. P_1 does

observe the monotinicity axiom and, as is true for all indexes in this class. It is additively decomposable.

Both P_0 and P_1, however, are not affected by transfers between poor people. For this reason, the squared poverty gap or poverty severity index, P_2 is also sometimes calculated. This is estimated as:

$$P_2 = \frac{1}{N}\sum_{i=1}^{q} \left[\frac{z - x_i}{z}\right]^2$$

This index gives more weight to the very poor and can be thought of as a weighted average of the poverty gap, where the weights are the poverty gaps themselves expressed as a proportion of the poverty line. In practice, however, this index can be difficult to interpret and explain and it does not really have an intuitive explanation for the non-specialist.

XI.2.3 MEASURES OF INCOME INEQUALITY

"Inequality is a broader concept than poverty in that it is defined over the entire population, not just for the portion of the population below a certain poverty threshold. Whereas poverty may be defined in absolute terms (e.g. living on less than $1/day) or relative terms (e.g. the poorest 20% of the population), inequality is inherently relative. Poverty and inequality can change in different directions. For example, over the past decade poverty has fallen in both Brazil and China, but inequality has increased in China while it has decreased in Brazil". (World Bank, 2011)

In order to understand how policy measures affect the well being of different population groups, it is necessary to have measures not only of the level of poverty, but also of inequality, which reflects the overall distribution of income, or other measures of welfare, over the whole population. For example, the impact of economic growth on poverty depends not just on the increase in average incomes, but also on which group of people benefit.

It is important, therefore, to have ways of measuring the level of inequality in different populations, in order to understand how it is changing over time and between population groups. Several summary measures of inequality have been developed, and some are discussed here. A much more detailed presentation is provided in Atkinson (1983), which is the classic treatment of the topic, and Duclos and Araar (2006).

Perhaps the simplest way to measure inequality is to calculate the average or share of income (or other measures of welfare) that accrue to population groups ordered by income. For example, the population can be divided into equal size groups depending on their income. It is then possible to compare the average income level of the poorest 20% or the poorest quintile with the average income of the richest. The more unequal the distribution of income, then the greater will be the difference between the incomes of the poorest and the richest households. A similar picture can be presented by comparing the share of total income accruing to the households in the two groups.
This information can also be presented graphically by constructing the Lorenz curve. This is a familiar way of representing the concentration of incomes graphically. It plots

cumulative proportions of the population, from the poorest upwards, against the cumulative shares of income that they receive. If all incomes were identical, this would trace a diagonal 45-degree line ("line of perfect equality"). In the other extreme case - if the richest unit received all the income - the Lorenz curve would lie along the horizontal axis, and then along the vertical axis at the 100% income share ("line of perfect inequality") [1].

The Lorenz curve allows for an unambiguous comparison of the relative distribution in two or more populations only where the curves do not intersect. One distribution is unambiguously more equal than the other if every point on its Lorenz curve lies inside (upper-left) the other (the first has Lorenz superiority to the second). If two Lorenz curve cross, it is not possible to say which curve represents a more equal distribution of income.

A commonly used derived summary statistic used to characterise the distribution of incomes is the *Gini* coefficient[2]. The Gini coefficient is defined as the area between the Lorenz curve and the 45 degree line as a ratio to the area of whole triangle. The Gini coefficient is 0 when all incomes are distributed equally and 1 (or 100 if expressed in a form more comparable with other indices) when there is perfect inequality. The Gini coefficient may by calculated from the formula:

$$G = \frac{2}{n^2 \bar{y}} \sum_{i=1}^{n} i\left(y_i - \bar{y}\right)$$

Where: n = the total population, $\bar{y}$ = average income and y_i = the income of the i[th] household.

The Gini coefficient satisfies a number of desirable properties for an index of inequality, in that it is independent of the mean level of income in the population and it is unaffected by populations size. It also is symmetric since if two people exchange incomes the index does not change, but it does change if income is transferred from a well-off household to one that its poorer, since, in this case the index will be reduced. It does suffer from a concern in that it cannot be decomposed. The Gini coefficient for a whole population is not the sum of the coefficients for all the sub-groups.

[1]When drawing Lorenz curves, "bottom coding" may be necessary in order to avoid bias. If the adjusted disposable income of a household is negative, its income is adjusted to zero, and if the income is lower than 10 per cent of the upper bound value of the first decile, it is adjusted to that value (10 per cent of the upper bound value of the first decile). For example, if the upper bound value of the first decile in a country (adjusted disposable income basis) were $2,000, all the adjusted disposable incomes lower than $200 (10% of $2,000) would be adjusted to $200 (Atkinson *et al.*, 1995). The same adjustment is done for the Gini coefficients in the next section.

[2]See Appendix D of Ashok *et al.* (2002) for making adjustments to Gini coefficient calculations to allow for negative incomes.

XI.2.4 MORE COMPLEX INDICATORS

Finally, as an alternative summary measure, the Sen index can be considered. This was developed by Sen to combine the three of the indicators described above into a single indicator of poverty for a given poverty line. The three indicators of low income are:

- *Low-income rate or head-count ratio: a proportion of the population below a specified percentage of the median;*
- *The average low-income gap: the difference between the average income of the low-income households and the low-income line, as a percentage of that low income line;*
- *Gini coefficient: the area between the Lorenz curve and the 45 degree line as a ratio of the whole triangle that represents a degree of inequality in the distribution of income.*

The Sen index consists of the head-count ratio multiplied by the income-gap ratio augmented by the Gini coefficient of the poor, weighted by the ratio of the mean income of the poor to the poverty-line income level, and multiplied by 100 to be in a form comparable with other indicators. The Sen index is thus defined in the following way (Förster, 1994; p.21):

$$S = LIR\left[ALG + \frac{\overline{y_q}}{z} G_p \right]$$

$$= LIR\left[ALG + (1 - ALG) G_p \right]$$

Where: LIR = low-income rate (head-count ratio)

ALG = average low-income gap

$\overline{y_q}$ = average income of the low-income population

z = poverty line

G_p = Gini coefficient of income inequality among the poor only.

In short, the Sen index can be interpreted as a weighted sum of poverty gaps of the poor. The values for the Sen index lie in the closed interval, with $S = 0$ if everyone has an income above the poverty line, and $S = 1$ (or 100) if everyone has zero income. The Sen index is useful for cross-country comparisons of poverty, because it combines the incidence, the intensity and the distribution of low incomes in a single indicator. While the Sen index has been widely discussed in the poverty literature and it has a number of desirable characteristics, including taking the income distribution among the poor into account, in practice it is not widely used. It lacks the intuitive appeal of the simpler measures of poverty and it "cannot be used to decompose poverty into contributions for different sub-groups" (Deaton, 1997).

XI.2.5 WARNING IN THE INTERPRETATION OF COEFFICIENTS

Though the Canberra Group (2001) report does not offer much detailed advice on the use of the different ways of measuring poverty or inequality, it makes some valuable

comments on the care with which changes in coefficients over time (such as the Gini coefficient) have to be treated. The problems that may arise when attempting to identify trends include:

Two point trends. Comparable household income micro-data may only be available for two periods. Having two periods permits the user to estimate the change between them, but it may convey a misleading impression of the underlying trend. There is considerable danger in taking a very small number of years to extrapolate long-run trends.

Business cycle effects. Because of cyclical variations in inequality, trends based on an arbitrary time period (e.g., 1980 to 1995) might produce misleading comparisons if its "fit" with the business cycle differs between nations. If trends in inequality are pro-cyclical - as is the case in the United States - peak (year) to trough (year) trend estimates are biased downwards while trough to peak trends are biased upwards. The opposite holds if inequality trends are counter-cyclical. Comparing peak-to-peak or trough-to-trough provides the least biased estimates and this requires a lengthy time series of estimates.

Mixing datasets and definitions. The only 'time series' available may have been constructed using several income definitions and/or several datasets over time. In general, mixing cursorily different datasets to form a single trend is not recommended as the trend will reflect *both* the "real" inequality change *and* differences across datasets.

Finally, it is worth remembering the fundamental point that most coefficients will have been calculated from survey data and will therefore be subject to sampling variability, a problem that could be worsened when statistical information is gathered in "less than ideal" circumstances, as in some developing countries.

XI.3 POVERTY LINES AND INEQUALITY MEASURES IN PRACTICE IN AGRICULTURE

All poverty lines are arbitrary. The choice between measures and the method of their determination depends essentially on the problem at hand and the dominant social values. In developed countries, the absolutist approach is now less in favour because of rising general levels of consumption and changed public perceptions of poverty. In richer countries, bare physical subsistence criteria have been replaced by criteria relating to the ability to participate acceptably in the social system (Van Slooten and Coverdale, 1977). In developing countries, where absolute poverty is more prevalent, especially among agricultural households and rural communities, then the policy focus tends to be on an absolute poverty line that may well be related to some notion of basic needs. Even here, though the choice of the poverty line is essentially a political one (Madden, 1975).

Another set of value judgements is involved when equivalence scales are used to apply poverty lines to families of different sizes and compositions. If the marginal needs of additional household members are given a low rating, then poverty among (often elderly) single-person households is emphasised more and family poverty is emphasised

less. On the other hand, a high rating will make poverty appear more "rural" and, in the European context, more "southern."

For practical purposes many countries utilise a poverty line in their general welfare policies, though it may not be labelled bluntly as such. Its practical implementation may involve measuring the cost of some single parameter, such as the necessary family expenditure on food, and extrapolating from this to the total income required to cover all purposes at the poverty level. The United States has used a poverty line developed from the USDA's Low Cost Food Plan, the poverty line income being three times this on the grounds that average food expenditure comprised about one third of the typical family's budget (the Orshansky index [Orshansky, 1963]). This was clearly inappropriate for farm families which produced more of their own food than the typical United States family, so the poverty line for farm families was set initially at 60% of the standard line (Bryant *et al*., 1981). Criticism that, while food costs of farmers were lower, this did not necessarily apply to the other components in family budgets, resulted in the gradual narrowing of the farm/non-farm poverty lines to 85% in 1969 and its total elimination in 1981 (see Fisher, 1997a, 1997b and 1992). In Australia, the 1973 Henderson Poverty Enquiry used a farmer poverty line 20% below that for all families (Vincent, 1976). In Canada, the similar "low income cut-off" is defined differently for rural and non-rural households (OECD, 1995).

There are problems associated with using an income base that is too narrow when assessing the extent of poverty, especially rural poverty. The point has already been made on numerous occasions in this Handbook that many households that operate farms also receive income from non-farm sources, and to restrict consideration to only what they gain from agriculture will seriously misrepresent their ability to consume. Pluriactivity, and hence multiple income sources, is found in countries at all stages of economic development; among OECD countries there is, in addition, a complex pattern of rewards from property ownership, social welfare receipts and other transfers. The relevance of going beyond sources of current income as seen in conventional accounting systems is illustrated by the impact on the numbers of United States rural families classed as poor when the concept of income was widened to include unrealised capital gains and the value of non-market services provided by owner-occupied housing, home-grown food and do-it-yourself activities in addition to annual money income (which is used in official United States statistics). All of these additional forms of income are probably more important for agricultural households than for non-agricultural ones and especially for poor ones (Gardner, 1975). This "full income" approach attempted to estimate the purchasing power available for consumption and saving in a normal year. In the absence of reliable data by which piecemeal corrections could be made to income data, Gardner used an intricate method based on rates of return on the factors (land, capital and human) used on farms. Because of this, substantial errors were probably involved, but the methodology gives a first approximation of the importance of taking a wider income view. In 1969, 20% of rural farm families were below the poverty line when using conventional income measurement. Taking a full-income approach reduced this to the range 5% to 14%, depending on certain assumptions. Seven to eight percentage points of this reduction was attributable to a more equal distribution of farm incomes and a further five percentage points was due to a higher average income.

Poverty lines are easier to define and use where incomes are stable. The random variation in agricultural incomes from year to year, principally weather-related, means that in some years a farm family could fall below the line and in other years be above it. Classification on a single year's income, as is common in income distribution statistics, would be foolish. Evidence from Australia, Denmark and Germany (see Chapter IX, Section IX.5) suggests that a distinction should be drawn between the core of farm households that are in a persistent low income situation and those who suffer temporary low incomes. While the former are likely to constitute a welfare problem requiring intervention with public funds, the latter are not. How far low incomes have to fall, and for how long, before government action is justified is, of course, a matter of political judgement.

Despite methodological difficulties, one might have supposed that the importance of low incomes to agricultural policy would have engendered a substantial effort by official statisticians to assess the number of farm families who fall below poverty lines. This is not the case. Only in the United States have figures for farmers who are in poverty been published regularly (though this has now ceased in favour of a more complex periodic assessment – see Offutt and Gundersen, 2005), and even these do not seem to have been of major importance in shaping agricultural policy. Other developed countries have occasional studies or pieces of research, though these are not numerous. The use of a poverty line for farm families in Australia, referred to above, was part of a special investigation that has not been repeated. The OECD study of low incomes in agriculture (OECD, 2001) mentions only Belgium, Canada, Czech Republic, Ireland, New Zealand and Turkey as having national studies that have considered the distribution of incomes (household or individual). Even here, poverty lines do not often form part of the methodology. In most of the EU Member States the information by which such an exercise could be carried out is either not co-ordinated or simply not collected. One of the exceptions is Ireland where there are not only periodic studies of income distributions for farmers based on the household budget survey (which links with the National Farms Survey to improve data quality), but also special welfare payments for landholders whose incomes fall below specified thresholds (the Farm Assist Scheme, which is a means tested social insurance scheme). Some 20% to 25% of landholders seemed to qualify in the 1980s.

In the absence of basic data, the matter of how best to calculate and use the poverty line and measures of inequality that may be of policy interest shrink to irrelevance. So too do the more modest ways outlined by the Canberra Group report (using graphical presentations, medians, quartiles and Gini coefficients). Nevertheless, it is to be hoped that further developments in this direction will be possible once data sources are in a more satisfactory state.

XI.4 OTHER MEASURES OF WELL-BEING

Fabrice Nimpagaritse and David Culver have written about well-being in Canada (Nimpagaritse and Culver, 2010) (See Chapter I). They consider that the concept of well-being refers to a dynamic process that gives people a sense of how their lives are evolving. Although, it has multidimensional aspects, it is traditionally measured by economic indicators, such as the level of income, incidence of low income and wealth.

Economic indicators provide ways to evaluate how the benefits of national product are distributed across society. However, once a certain level of income is reached; several studies have demonstrated that additional income is not equally followed by an increase in the overall well-being.

To a large extent, the concept of well-being is subjective and not easily measurable. Nevertheless, there are some universal measurable needs which are internationally recognized that should be met in order to lead to a good life. The universality of need rests upon the belief that if they are not satisfied, harm of some objective kind will result. Harm can be defined as fundamental disablement in the pursuit of one's vision of good or an impediment to successful social participation. The non-economic aspects of well-being, such as health, education, better housing, etc, are as important as many economic measures and can be inter-connected with economic indicators.

Together, both economic and non-economic indicators can provide an enhanced comprehensive description of the well-being of society and individuals as well as measuring progress over time.

XI.4.1 SOCIAL EXCLUSION

While social exclusion is a concern for society in general, it is of special interest in an agricultural society. For individuals in particular groups, social exclusion is a form of marginalization leading to economic deprivation in terms of limitations of functionings of living standards (the term "functionings" in the literature, following Sen, means what a person succeeds in doing and being) and various forms of social and cultural disadvantage. Social exclusion in a rural environment, where self-employed work is "unpaid," may be disguised in that it may not manifest itself in unemployment *per se* but in low income and low wealth farm households.

Social exclusion is related to both inequality and poverty and may be expressed in terms of both the number and quality of functionings from which the person is excluded. Its multifaceted nature can be captured by reporting the proportions of households having financial difficulties, not having access to basic necessities, living in bad housing conditions, having infrequent social contacts, dissatisfied with the work or living conditions, etc.

XI.4.2 MUTLIDIMENSIONAL POVERTY MEASUREMENT

In order to capture the multidimensionality of inequality and poverty a comprehensive measure of poverty which pools indicators such as the headcount, the income gap, the difference in income between social groups, and the within-group Gini (see below) into a single poverty ratio is required (Dagum and Costa, 2003). Dagum and Costa also propose a methodology to develop a multivariate analysis of poverty, which also includes elements of social exclusion and limitations in the space of functionings and capabilities.

Recent work by the Oxford Poverty and Human Development Initiative (OPHI) reported in Alkire and Santos (2010) has led to the development of a new international measure of poverty, which has featured in the 20th anniversary edition of UNDP's 2010 Human Development Report (UNDP, 2010). The aim of the new initiative is to go beyond the traditional focus on income to capture the multiple deprivations that poor people face in

areas such as education, health and living standards. The Multidimensional Poverty Index (MPI) assesses the nature and depth of poverty in individuals, with poor people identified as those facing multiple deprivations. The MPI is an index of acute multidimensional poverty, focusing on three areas of deprivation.

Education – defining people as deprived if no member of the household has completed five years of schooling and if any school-aged child is not attending school in years one to eight.

Health – where people are derived if any child has died in the family and if any adult or child for whom there are data is malnourished.

Standard of Living – where six indicators are considered: access to electricity; access to clean drinking water; access to improved sanitation; living in a household with a dirt, sand or dung floor; cooking with wood, charcoal or dung; and not owning more than one asset out of a list comprising radio, TV, telephone, bike or motorbike and the household does not own a car or a tractor.

Each indicator contributes equally to the overall index and each dimension is also equally weighted. The indicators can be decomposed by population group and can also be broken down by dimension.

The EU initiative on statistics on income and living conditions (EU-SILC) was formally launched in 2004 in 15 countries and expanded in 2005 to cover all of the then EU-25 Member States, together with Iceland and Norway. Bulgaria launched EU-SILC in 2006, while Romania, Switzerland and Turkey introduced the survey in 2007 (Eurostat, 2011).

EU-SILC comprises both a cross-sectional dimension and a longitudinal dimension; it includes indicators of the distribution of income and of relative poverty and is based on three-dimensions: the relative risk of poverty; material deprivation and low work intensity. The risk of poverty is defined as households with a standardised income lower than 60% of the median income for their country and the standardisation is based on purchasing power parities. Material deprivation relates to households that lack three or more items from a standard list of nine applied across all countries, and low work intensity is defined as people living in households exploiting 20% or less of their available labour resources.

These (and other) multidimensional indexes attempt to capture the complexity of poverty and well being and its many facets in different circumstances. In talking about measurement, however it is always useful to ask:

- *Is it helpful to try to aggregate all the different dimensions of poverty in one single indicator?*
- *Is it possible to do it in a sensible and practical way?*
- *Does the aggregation in one indicator help in policy decision making?*

This Handbook recognises the usefulness of calculating the basic statistical characteristics of the distribution of incomes of agricultural households, including medians and quartiles, and measures of inequality and of poverty based on them.

The use of Lorenz curves, low income rates etc. is encouraged, with comparisons drawn over time, geographically and between agricultural households (variously defined) and other socio-professional group, suitable attention being given to hazards in these comparisons. When setting income poverty lines no particular methodology is preferred, though accounts of the methods used should accompany results.

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Focus on Low Incomes among Agricultural Households in OECD Countries

In its work on low incomes in agriculture the OECD (2001) has outlined ways of measuring poverty among agricultural households in its Member countries. The OECD's methodology is based on international practice and uses evidence from the Luxembourg Income Study (LIS) database for the mid-1990s to compare the degree of "low-income" in agricultural households to other households in the different countries. Twenty-one countries provided data, including thirteen of the EU-15; Portugal and Greece were unfortunate omissions. This is regrettable as, arguably, low incomes among agricultural households are particularly problematic in these two countries. Both the "broad" and "narrow" definitions of an agricultural household were applied[1]. The sources of data for the LIS database are principally household (family) budget surveys or panel surveys. Unfortunately, such general surveys have well-known deficiencies; they usually have few agricultural cases and the quality of income data is sometimes suspect, particularly where gaps in coverage of the components of income prevent full comparability between agricultural and other households. For these reasons Eurostat has so far declined to use them to generate microeconomic statistics on agricultural households. The desire to improve this data situation is, of course, one reason for assembling this Handbook. Having said this, the OECD's descriptions of statistical presentations of low incomes are entirely valid and can form a template for application in situations where suitable data exist.

1) Low-income rate (Cumulative proportions below percentiles of the median)

The first method of presenting low income often adopted in international comparisons is to ask what proportion of the population is below specified percentages of the median income. This proportion is often called the *low-income rate*. Though the results must be treated with caution (because of the quality of the basic data), some of the main features of the OECD/LIS analysis are worth noting. If the standard of low income was taken as 50% of the median income of all households, and if the "broad" definition of an agricultural household was adopted, the incidence of low-incomes was much higher in agricultural households than in other households in nine countries (Australia, Denmark, France, Hungary, Ireland, Italy, Netherlands, Poland, Spain). The highest incidences of low-income were recorded in Hungary (33.8%), Australia (25.4%) and Ireland (24.6%). The largest differences in the percentage of low-income agricultural households and low-income non-agricultural households were recorded in Hungary, Poland, Ireland and Australia. The smallest differences were recorded in the Czech Republic, Canada and Finland. However, if the "narrow" definition of an agricultural household was taken, the results were different. With the exception of Hungary, the Netherlands and the UK, the low-income rate among agricultural households was higher. Moreover (again when using the "narrow" definition), the number of countries where the incidence of low-

[1]In the broad definition, a farm household is "a household whose farm self-employment income is not zero". In the narrow definition a farm household is "a household whose farm self-employment income is more than 50% of total household income." For the purpose of income measurement at the household level, disposable income was used, adjusted for household size (equivalence elasticity = 0.55) (see Förster, 1994). The low-income threshold was 50% of the median (disposable) income of all households.

income was higher among agricultural households than among non-agricultural households increased from nine to thirteen. These examples illustrate the importance of the choice of definition of an agricultural household to the outcome of the analysis.

2) The low income gap

The cumulative proportions below given percentiles of the median (i.e. the low-income rate described above), provides useful information on the incidence of low-income. However, it does not capture the intensity of low income. That is, it does not show how far the low-income households fall below a given cut-off line. The average low-income gap (ALG) is commonly used as an indicator of this intensity, and it is defined as the difference between the average income of the low-income households and the low-income line, as a percentage of that low-income line:

$$\text{ALG} = \frac{z - \bar{y}_q}{z}$$

where

z = low-income threshold

$\bar{y}_q$ = average income of the low-income population

Using this methodology, the OECD analysis found that the low-income gap was bigger in agricultural households than in non-agricultural households in all the countries where data were available. This means the intensity of poverty was higher among agricultural households. Comparisons between the income gaps calculated using the two definitions of an agricultural household found that the "narrow" definition produced a bigger low-income gap in all countries, although the extent of the widening of this gap varied amongst countries.

3) Relative income level by percentile

Low-income rates indicate the share of the population below specified percentages of the median. An alternative way to examine a distribution of income is to compare the income of households at selected percentiles with the median income.

For example, in Australia in 1994/95 the median income (adjusted by household size) per household for all households was AS$16,708. Agricultural households in the lower quartile, i.e. 25% up from the bottom, had a medium income of AS$8,282 and expressed as a percentage of the median, was 49.6%.[2] The corresponding figure for non-agricultural households was 59.3%. These results can be interpreted as follows; the agricultural household income at its lower quartile was about half of the median income of all households and about 10% below that of non-agricultural households at the same quartile.

[2]This figure represents the upper-bound value of the lower quartile.

In the OECD/LIS analysis, if the lower quartile of both agricultural households and non-agricultural households were compared, seven of the countries had agricultural household income below that of non-agricultural households. If the "narrow" definition was taken, the number of countries which had inferior agricultural household incomes at the lower quartile increased to eleven.

4) Cumulative decile shares - Lorenz curve

Relative income level per percentile reveals relative income levels of households at certain percentiles compared to the median income. In order to understand the concentration of incomes, it is useful to know cumulative shares of total income. The Lorenz curve is a familiar construction to illustrate graphically the concentration of incomes[3]. It plots cumulative proportions of the population, from the poorest upwards, against the cumulative shares of income that they receive. If all incomes were identical, this would trace a diagonal 45-degree line ("line of perfect equality"). In the other extreme case - if the richest unit received all the income - the Lorenz curve would lie along the horizontal axis, and then along the vertical axis at the 100% income share ("line of perfect inequality").

The Lorenz curve allows for an unambiguous comparison of the relative distribution in cases where the curves do not intersect. One distribution is unambiguously more equal than the other if every point on its Lorenz curve lies inside (upper-left) the other (the first has Lorenz superiority to the second). If two Lorenz curve cross, it is not possible to say which curve represents a more equal distribution of income.

In the OECD/LIS analysis, unambiguous comparisons between agricultural households and non-agricultural households were not always possible because the curves crossed. However, where this problem was not encountered, there were some interesting and mixed results. With both the "broad" and "narrow" definitions, non-agricultural households had Lorenz superiority over agricultural households in most countries, but with exceptions. When comparisons were made between the two ways of defining the agricultural household, in most countries the "broad" definition produced a Lorenz superior result, though in Finland and Norway the "narrow" approach was superior.

[3]When drawing Lorenz curves, "bottom coding" may be necessary in order to avoid bias. If the adjusted disposable income of a household is negative, its income is adjusted to zero, and if the income is lower than 10 per cent of the upper bound value of the first decile, it is adjusted to that value (10 per cent of the upper bound value of the first decile). For example, if the upper bound value of the first decile in a country (adjusted disposable income basis) were $2,000, all the adjusted disposable incomes lower than $200 (10% of $2,000) would be adjusted to $200 (Atkinson *et al*., 1995). The same adjustment is done for the Gini coefficients in the next section.

5) Gini coefficient

A derived summary statistic used to characterise the distribution of incomes is the Gini coefficient. The Gini coefficient is defined as the area between the Lorenz curve and the 45-degree line as a ratio to the area of whole triangle. The Gini coefficient is 0 when all incomes are distributed equally and 1 (or 100 if expressed in a form more comparable with other indices) when there is perfect inequality. The Gini coefficient may by calculated from the formula:

$$G = \frac{2}{n^2 \bar{y}} \sum_{i=1}^{n} i\left(y_i - \bar{y}\right)$$

where

n = total population

$\bar{y}$ = average income

y_i = income of the i^{th} household

In the OECD/LIS analysis a mixed pattern emerged, both between countries and when using the "broad" and "narrow" definitions of an agricultural household. In some countries the Gini coefficient was lower in agricultural households than in non-agricultural households, i.e. incomes were distributed more equally in agricultural households. For others, the reverse was true. If the results from the "broad" and the "narrow" definitions were compared, the Gini coefficient was higher when using the narrow definition in most countries, suggesting that the distribution is more equal when all households having some income from agriculture are included (see Appendix D of Ashok *et al.* [2002] for making adjustments to Gini coefficient calculations to allow for negative incomes).

6) Sen index

Finally, as an alternative summary measure, the Sen index can be considered. This was developed by Sen to combine the three indicators described above into a single indicator of poverty for a given poverty line. To recap, the three indicators of low income are:

- *Low-income rate - Cumulative proportions below percentiles of median*: a proportion of the population is below specified percentages of the median;
- *The average low-income gap:* the difference between the average income of the low-income households and the low-income line (specified percentages of the median), as a percentage of that low income line;
- *Gini coefficient:* area between the Lorenz curve and the 45 degree line as a ratio of the whole triangle that represents a degree of inequality in the distribution of income.

The Sen index consists of the head-count ratio multiplied by the income-gap ratio augmented by the Gini coefficient of the poor weighted by the ratio of the mean income of the poor to the poverty-line income level, and multiplied by 100 to be in a form

comparable with other indicators. The Sen index is thus defined in the following way (Förster, 1994; p.21):

$$S = LIR\left[ALG + \frac{\overline{y_q}}{z} G_p \right]$$

$$= LIR\left[ALG + (1 - ALG) G_p \right]$$

where

LIR = low-income rate (head-count ratio)

ALG = average low-income gap

$\overline{y_q}$ = average income of the low-income population

z = poverty line

G_p = Gini coefficient of income inequality among the low-income population.

In short, the Sen index can be interpreted as a weighted sum of poverty gaps of the poor. The values for the Sen index lie in the closed interval, with S = 0 if everyone has an income above the poverty line, and S = 1 (or 100) if everyone has zero income. The Sen index is useful for cross-country comparisons of poverty, because it combines the incidence, the intensity and the distribution of low incomes in a single indicator[4].

According to the OECD/LIS analysis, if the Sen indices of agricultural households (using the "broad" definition of agricultural household) and non-agricultural households that had less than 50% of the median income were compared, the Sen index was generally higher for agricultural households, i.e. the degree of poverty was greater. If the "narrow" definition of agricultural household was taken, the Sen index was also higher in agricultural households in all the countries where the data were available. However, for most of the countries, the Sen index was lower using the "broad" definition than it was when the "narrow" definition was used. That is, the degree of poverty among agricultural households was higher when using the "narrow" definition of an agricultural household.

[4]Unfortunately because of a problem of sample size, a Sen index could not be calculated for several countries.

FOCUS PIECES

Förster. M.F. (1994). *Measurement of low incomes and poverty in a perspective of international comparisons*. OECD Labour Market and Social Policy Occasional Paper No. 14. OECD, Paris.

OECD (2001). *Low incomes in agriculture in OECD countries*. AGR/CA/APM(2001)19/FINAL. OECD, Paris

Focus on Poverty in Developing Countries

The Handbook on Poverty Statistics: Concepts, Methods and Policy Use

The UN Statistics Division has had a project to produce a Handbook on Poverty Statistics. The overall objective of the project is to assist policy-makers and statisticians in member countries to face the growing demand for poverty statistics and related information by building up a system of poverty measurement which is responsive to national and international data needs. In particular, the project will help share experience in the collection and analysis of poverty statistics across different regions, provide countries with an overview over the extensive literature on poverty and put forward the options available at the country level. Furthermore, it will provide some practical guidance for the compilation and reporting of poverty data.

Below is a list of documents available in electronic format from the World Bank that contains background material for the Handbook. The list is intended to be suggestive but not comprehensive. The list will evolve as the discussion on the publication progresses and other materials are recommended by the Steering Committee for inclusion.

Chakravarty, Satya R., Ravi Kanbur and Diganta Mukherjee, Population growth and poverty measurement (June 2002)

Coudouel Aline, Jesko S. Hentschel, and Quentin T. Wodon, Poverty Measurement and Analysis

David Isidoro P, On Comparability of Poverty Statistics From Different Sources and Dissagregation Levels (November 2002)

David Isidoro P, Issues in estimating the Poverty Line (May 2001)

David Isidoro P, Poverty Statistics and Indicators: How often should they be measured? (August 2000)

Deaton Angus, Measuring poverty in a growing world (or measuring growth in a poor world); First version June 2003

Deaton Angus, How to monitor poverty for the Millennium Development Goals (March 2003)

Deaton Angus, Counting the World's Poor: Problems and Possible Solutions (Fall 2001)

Dikhanov, Y. and M. Ward, Counting The Poor More Comprehensively (The Evolution of the Global Distribution of Income; ISI General Conference, Seoul, Rep. of Korea, August 2001)

International Fund for Agricultural Development (IFAD), Rural poverty Report 2001- The Challenge of ending Rural Poverty

Kanbur, Ravi, and Diganta Mukherjee, Premature Mortality and Poverty Measurement (March 2003)

Kanbur, Ravi, Qual-Quant, Qualitative and Quantitative Poverty Appraisal: Complementarites, tensions and the way forward (Contributions to a Workshop held at Cornell University, March 2001)

Kanbur, Ravi and Lyn Squire, The Evolution of Thinking About Poverty: Exploring the Interactions (September 1999)

Laderchi, Caterina Ruggeri, Ruhi Saith and Frances Stewart, Everyone agrees we need poverty reduction, but not what this means: does this matter? (May 2003)

United Nations Development Programme (UNDP), United Nations Economic Commission for Latin America and the Caribbean (UNECLAC), Brazilian Institute for Applied Economic Research, Meeting the Millennium Poverty Reduction Targets in Latin America and the Caribbean, 2002). English, Spanish.

United Nations, Provisional Guidelines on Statistics of the Distribution of Income, Consumption and Accumulation of Households (1977) - *English*, *French*, *Spanish*

United Nations Statistics Division (UNSD), Millennium.un.org, Target 1. Eradicate extreme poverty and hunger (2003). *English*, French)

World Bank, Distribution of income or consumption (World Development Indicators, 2002)

World Bank, Population below national and international poverty lines and poverty gap (World Development Indicators, 2003)

The text of the first chapter of the Handbook on Poverty Measurement Analysis is a recommended reading on this subject (Link to relevant Extended Reference)

CHAPTER XII

MEASUREMENT AND COMPOSITION OF FARM HOUSEHOLD WEALTH

XII.1 INTRODUCTION

Wealth is a potent component in the factors which determine the position of the agricultural community within society. Wealth is important because it gives rise not only to income in a variety of forms but because it also provides security, freedom of manoeuvre, and economic and political power. Within society as a whole, wealth seems to be much more unequally distributed than income and has a major influence on the overall degree of inequality (Atkinson, 1980). A political economy comparison of income and wealth distributions among farmers and the rest of society through time would be of great policy relevance in ways such as understanding the evolution of the accumulation of wealth through the life-cycle of the household statistical unit, identifying important causes of wealth inequality specific to different social groups, and proposing methods for lessening the recent increase in the concentration of wealth (Juster and Kuester 1991; Juster *et al*, 1999). How property ownership is regarded is an important part of any study of social inequality. "This is not only in the obvious sense that the distribution of material resources will in large part determine the character of that society's economic and political life, but also in the sense that such conceptions serve as important legitimising ideologies buttressing the stability of social life" (Newby *et al.*, 1978).

In **developing countries** there is striking evidence about the large negative impact of asset inequality (especially of land), rather than inequality in wage incomes, on future growth (Deininger and Squire, 1998; Deininger and Olinto, 1999). These studies also point out that the unequal distribution of assets also affects the equal distribution of opportunities for building both physical and human capital assets in the future. In general, the distribution of assets is the key determinant of the income distribution (Alesina and Rodrik, 1994).

In **OECD countries** the importance of wealth as a contributor to the economic welfare of farm households is well established. Attempts by governments to support the incomes of farmers tend to be capitalised into land values (the factor of production least elastic in supply), a phenomenon which results in landowning farmers and landlords often benefiting through capital gains (though this is probably not the intention) but with little improvement in incomes accruing to those without owned land. Changes in the value of assets (real capital gains) have been briefly mentioned as a component of personal income (Chapter X) for which measurement may be required.

Of course, farm households may hold wealth beyond that which relates to the farm, and this must be taken into account when assessing their overall position. They may also incur debts that are not directly related to their agricultural activities which should be considered when calculating their net worth.

However, the absolute value of wealth is also of interest. A common phenomenon in OECD countries is for cases of **low current income to be combined with substantial wealth**, suggesting that the potential power of the household to consume will be misrepresented if only income is taken into consideration. Another pattern is for the **wealth of farmers to increase with age** up to a plateau; in contrast, incomes first rise and then decline as old age is reached. Agricultural land is usually the main component among the assets. In part this wealth may represent provision for retirement. However, much of it is passed to succeeding generations, with important consequences for the distribution of assets in society. **Succession** in a family-farm is an especially significant issue because, besides the transmission of assets, it involves the transfer of knowledge and management skills to the next generation, which may contribute towards maintaining farm-household viability through time.

Technical issues are encountered when attempting to estimate wealth of agricultural households. Some relate to the difference between the farm business and the household as units over which measurement can be made (dealt with in some detail below). There is also the issue of valuation of capital items, which will usually be according to market price, though, where no market exists or in some other circumstances, may be taken as use value or cost of production (Hill, 2000b). The **valuation of farmland** is a particular problem in countries in which there is public intervention in the land market, such as by restricting who can purchase or by applying differential rates of capital taxation according to the status of the new owner (OECD, 1998, 2004).

In this chapter, the uses made of wealth measures for farms and farm households are discussed. Among OECD countries the US is taken as a case study because of the relatively good information that is available there. The reasons why estimates of net worth for farms are not synonymous with estimates of net worth for households that control farms are highlighted. This is followed by a discussion of what is included in wealth measures developed for farm households. The chapter continues with a discussion of some added insights gained from wealth measurement as a companion indicator to household and business income statistics and discusses data to support measurement of farm household wealth in OECD countries. In the later sections attention turns to developing countries, with a link to specific data sources in a number of examples.

XII.2 SELECTED USES OF FARM AND HOUSEHOLD WEALTH MEASURES

There are at least three main uses of farm-level net worth information, as revealed for example in the US where wealth estimates for farmers have existed since the early 1900s. The first addresses questions about **asset ownership and management**. Who owns the physical assets, particularly land, and who is farming the land? This reflects the issue of who owns or controls agricultural resources and is important to assessing changes in farm structure. A variety of public policy issues may arise from trends in asset ownership, including potential barriers to entry for farmers. Many of the benefits and costs of government policies are tied to asset ownership or control. Links between public programs and asset ownership raise issues about the distributive effects of government policies.

A second use centres on the financial position, or **solvency**, of businesses and, when combined with income, establishing measures of business profitability and liquidity[1]. When farms confront eroded asset values relative to debts or when they have insufficient funds to meet debt service commitments, farm failures may arise and erode the quality of lender portfolios. Spill-over of farm problems into the lending sector can affect rural communities more broadly, especially if banks begin to close or if they are unable to meet commitments to non-farm customers.

A third use of farm wealth data focuses on **access to credit**. Of interest in many countries is the availability of credit and financial services to small and beginning farm businesses. Information about the farm balance sheet, particularly lender market shares among different sizes of farming operations, and net worth helps inform this issue.

In addition, measures of farm household net worth have several uses in the estimation and analyses of **household economic status** and **wealth management** issues. These include: (1) providing information about assets which are an income source and debt which requires an expenditure from the household; (2) giving a measure of economic resiliency or the ability to withstand unanticipated financial shocks, including a potential source of funds to support consumption; (3) providing insight, based on the composition and accumulation of holdings, into how farmers build wealth; (4) establishing a capital stock to underpin decisions about retirement, financial security in later life, and the transfer of assets to a new generation of farmers; and (5) giving a basis for deriving more comprehensive measures of household economic well-being than can be attained through use of an income indicator alone.

[1]Solvency refers to the ability of a business to meet its long and short term obligations, usually measured by the ratio of total debt to total assets (or debt to equity or equity to assets). Liquidity refers to the ability of a business to meet short term obligations, usually measured by the current ratio (current assets divided by current liabilities), where current (or liquid) assets include cash and assets that can be quickly converted to cash at minimal cost, such as funds in savings and checking accounts or stocks traded on major stock exchanges. It should be noted that a firm with negative equity (debts larger than assets) may be able to continue operations as long as its income is capable of servicing its debt payments.
http://web1.msue.msu.edu/barrycty/factsheets/financialperformanceratios.htm).

As a source of income and expenditure of the household, assets and debts affect both the credit and debit sides of the household income statement. Assets are a source of property income in the form of interest, dividends, and rents. Assets may also be a source of service-related earnings of the farm holding that are in addition to income from production of agricultural commodities. Interest paid on debt is an expense, which may belong to the farm or to the household depending upon where debt is held. Taking into account the debt position and income level of the household may dramatically alter perspectives about the debt service capability of a farm business. Off-farm incomes of households, including property income, may make debt service commitments look less problematic than they would if made on the basis of farm earnings alone (McElroy *et al.*, 2002). But, household debt for non-farm purposes may also expose farm businesses to potential financial difficulty. Moreover, if a large share of household income is devoted to debt service, households have fewer resources for purchasing goods and services (Dynan *et al.*, 2003). Knowledge of the full set of assets and debts at both the farm and household levels, and total income from all sources, is necessary to accurately evaluate business and household solvency and to assess the ability of each to meet its financial commitments.

In addition to providing a potential source of property income and influencing debt status, measures of net worth provide a portrait of the economic resources available to households at a given point in time (Bureau of the Census [U.S.], 2003; Bureau of the Census [U.S.], 1994).

Wealth provides a capacity to draw down assets to generate an infusion of funds to sustain consumption when faced with an unanticipated economic or financial shock or to respond to a new business opportunity. Given that in many countries farm households, on average, spend a large portion of available work time and other resources participating in off-farm activities, shocks can emanate from either the non-farm or farm sectors of the economy, as well as from a wide variety of household events. The ability of a household to adjust to a financial or economic shock may be enhanced by the ability to sell, lease, or re-deploy assets such as land or other capital.

The composition of a household's portfolio may affect how it responds to changes in government policy or some other event. For example, a household that owns only machinery and equipment and leases land would not benefit from rising land values. In fact, if rents rise because of higher land values, the household may face higher costs and lower incomes. Meanwhile, households that own land may see their net worth rise. Of course, it is also possible, as the widespread US farm financial crisis of the 1980's illustrated, for land values to erode. This left farms and their controlling or ownership households in a difficult financial position, if not bankrupt. Knowledge of the composition of household net worth provides a basis for evaluating how effects of public policy or changes in the farm economy may be transmitted throughout the farm sector and rural areas.

In addition to accumulating wealth as a precaution against financial shocks, households also save to support financial security in retirement. Information about net worth and its composition may help identify segments of the farm community that may encounter difficulty in sustaining consumption and meeting basic needs without significant on-

going sources of income from earnings or from transfers from government or other sources.

Wealth measures are also important to understand household economic well-being. Aside from using assets or wealth in current production or to generate income in the form of interest, dividends or rents, a household can also realize gains or losses from the sale of assets. Even if not sold, household wealth could be converted to an annuity value and combined with income to provide a more robust estimate of consumption that household resources could support if assets were converted to cash. Hathaway makes this point by noting that, "changes in real wealth due to changes in asset values have much the same characteristics as current income in that they can be saved (e.g. used to increase net worth) or they can be consumed (via sale or borrowing) without decreasing net worth" (Hathaway, 1963). Whether taking stock of performance or debt service capability, examining the ability to sustain consumption and provide for basic living needs, or deriving indicators of economic well-being, household wealth measures improve the perspective (gained solely from the use of income measures or farm business measures) of the economic status of farm households and their members.

The Handbook recognizes that farm households may have multiple sources of farm and non-farm assets and/or liabilities. To help ensure accuracy and completeness of estimates, net worth measures should take into account both farm and non-farm sources of wealth. Estimates of net worth should also recognize that farm wealth may not be entirely owned by farm households.

XII.3 DIFFERENCES IN WEALTH MEASUREMENT FOR FARMS AND FARM OPERATOR HOUSEHOLDS

In OECD countries statistics on the wealth of agricultural households are rarely available at present. In contrast, many countries have surveys of farm accounts, and these usually collect data on the value of assets used by the agricultural holding (farm business) and associated liabilities, enabling estimates to be made of their net worth. An important example is the EU's Farm Accountancy Data Network – FADN/RICA – that comprises individual national surveys in Member States using a harmonised methodology. Some countries (such as the United Kingdom) estimate aggregate balance sheets for their agricultural industries. There is some concern on both theoretical and practical grounds about the validity of balance sheets drawn up for such "fictional" units as the holding or farm business (establishments or economic units, that produce agricultural output) (Hill, 2000a). This centres on what an agricultural asset is (a particular problem when these serve both production and consumption functions, such as cars) and whether liabilities (which can only be transacted by real people or other legal entities) can be deemed to be attributable to the "holding."

Many of these problems are eased considerably if the complete household-firm is the unit for which the balance sheet is drawn up. Unlike the "holding" or farm business which forms the basis of official farm accounts surveys, the household is an institutional

unit, and its net worth (wealth) will cover all the assets and liabilities of its members. Though it will be important to be able to group the individual items by type and use, overall the picture will be more reliable as an indicator of the economic situation of the household and is likely to be a superior explanatory variable for behaviour, such as the decision to invest or to leave farming.

Any picture of the wealth of agricultural households will reflect the definitions chosen for the household and the classification system used to distinguish an agricultural household from one belonging to some other socio-professional group. These issues were discussed at length in the context of income measurement in Chapter IX and repetition here is not necessary. Consistency between the definitions used for the measurement of incomes and of wealth is obviously important when the two are to be combined to describe the economic situation of farm operators. However, it should be borne in mind that the complex patterns of asset ownership within families may mean that a definition of household that embraces a range of owners may be preferable and influence the decision about the appropriate unit for income measurement. For example, in a two-generation household where land belongs to the parents but farming operations are carried out by their children (who are the nominal earners of the entrepreneurial income), it may make sense to use the dwelling household as the basic unit for measuring both income and wealth.

Even if a satisfactory concept of a farm household can be agreed, practicality may undermine its use. For example, in the US data on farm household wealth is collected by the national Agricultural Resource Management Survey (ARMS). A shortcoming is that data relate only to the *primary* operators of United States farms and their households (including individuals living in the operator's residence who share the financial resources of the farm operator). Ideally, data used to construct household wealth estimates would provide coverage for all households contributing assets and sharing in production risks, but non-primary operators are currently not included.

XII.4 CONNECTION BETWEEN FARMS AND HOUSEHOLDS IN WEALTH MEASUREMENT

Notwithstanding the point made earlier that households are institutional units and "holdings" or farm businesses are not, it can be instructive to trace the functional relationship between the two. These are of particular interest in situations where reality has moved away from the simplistic model of a family farm (in which a single family completely owns and operates a farming business without any other external activities or involvement) to one where there is a complex pattern of resource ownership, control and rewards.

Farm households **accumulate wealth** through a variety of avenues. One way is to consume less than is earned over a period of time. Another is through increasing asset values, due to changes in the conditions governing supply and demand for the asset and changes in the services associated directly or indirectly with the asset. A third way is through gifts, transfers or inheritances. Operators of farms use assets acquired from households and other legal entities to generate output and contribute to value added within the economy (see Figure XII.1). As business establishments, farms utilize assets

provided by multiple legal entities, including households and other businesses. Likewise, farm households may decide to allocate their assets in a variety of outlets. The farm business may be only one component of the household portfolio.

Business linkages are not only important in establishing the flow of resources to the farm, but are also valuable in helping understand the **distribution of farm income and wealth**. For example, of the 2.1 million US farms in 2002, 209,000 rented land under a share-rent arrangement. Under typical share-rent arrangements, landlords provide a share of operating inputs in addition to land. Other farms are organized as partnerships or family corporations and over 50,000 grew commodities under a contract arrangement with another entity. The variety of business organizations and arrangements being used by farmers suggests that the **net worth** of either the farm sector as a whole (which may or may not include the value of rented land, according to national convention) or individual farm businesses **cannot be assumed to belong entirely to farm households**. Data collection must also discern whether all farm assets and liabilities accrue to a single, or primary operator's household (see Figure XII.2). Meanwhile, households allocate their own resources to multiple uses. This means that measures of farm household wealth need to reflect portfolio decisions that take into account assets and/or liabilities outside the farm (see Figure XII.3).

The Handbook recognizes that farm households may have multiple sources of farm and non-farm assets and/or liabilities. To help ensure accuracy and completeness of estimates, net worth measures should take into account both farm and non-farm sources of wealth. Estimates of net worth should also recognize that farm wealth may not be entirely owned by farm households.

FIGURE XII.1
Modern farms use Inputs from a variety of sources who in return share in Input and Income

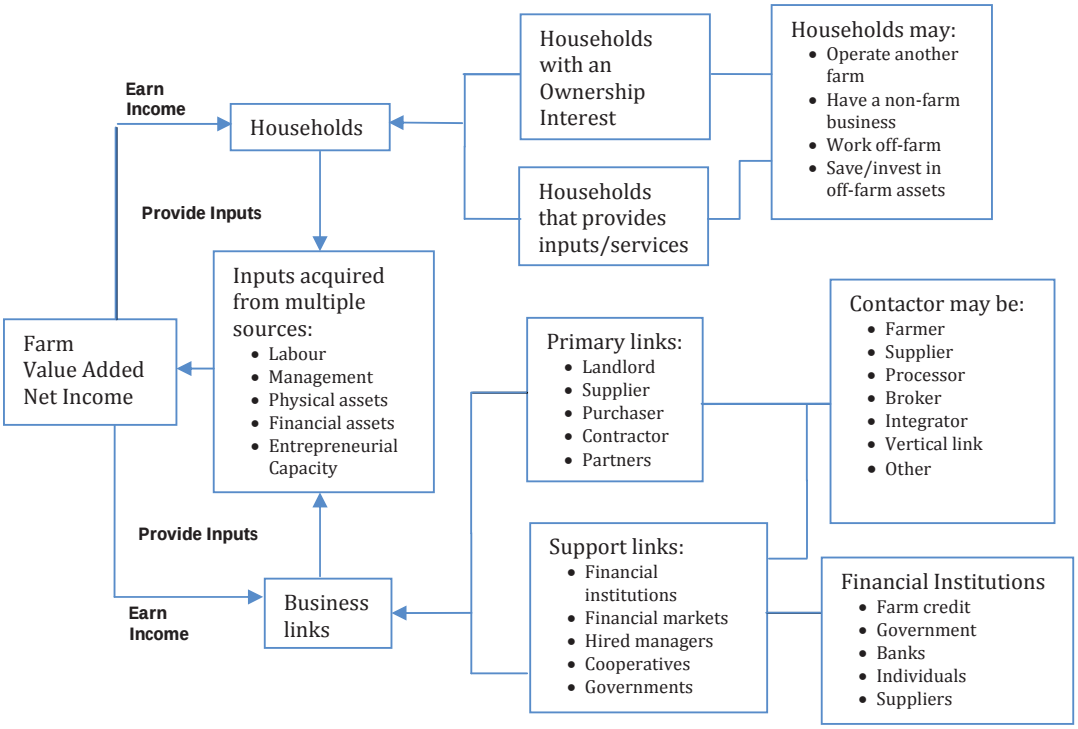


FIGURE XII.2
Households share farm Net Worth with other providing Inputs

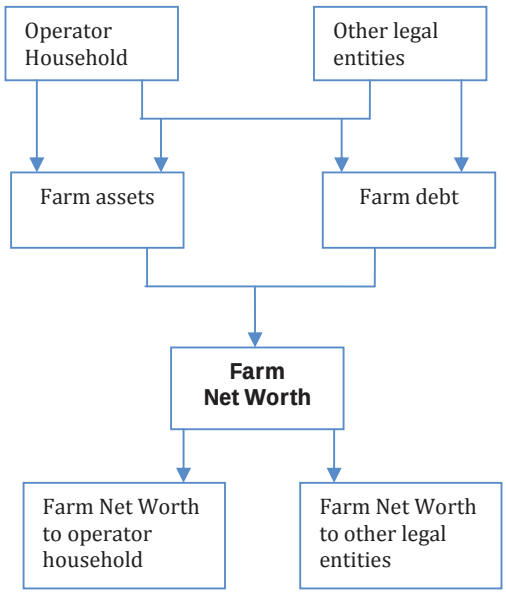
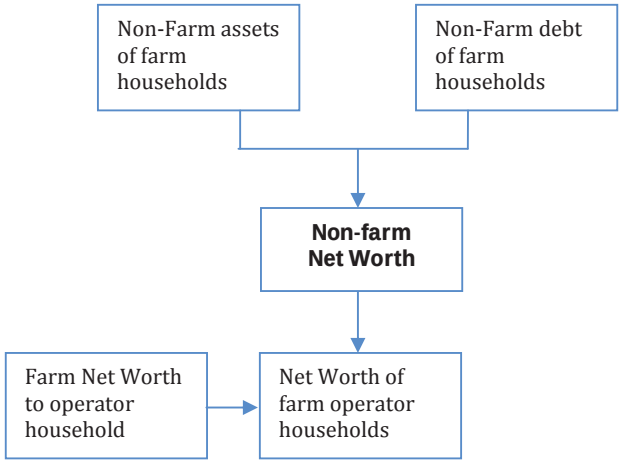


FIGURE XII.3
Operator households' Net Worth originates from farm and non-farm assets and liabilities



The Handbook recognizes that household net worth is the summation of farm net worth (assets minus debts) and non-farm net worth (assets minus debts)

XII.5 EXTENDING ANALYSES OF HOUSEHOLD ECONOMIC STATUS AND WELL-BEING

Measures of wealth can complement use of money or other income measures for evaluating business or household economic or financial performance. This section discusses how household wealth estimates can help extend analyses of household economic well-being based on income measures.

Capital gains as income. Household incomes may include income from property and transfers. Realized property income has typically been included in measures of household income as interest and dividends. Household assets, whether associated with their farm or in other forms, may be subject to gains or losses in value from a variety of macro- and micro- economic events, policies, or programs. Whether or how capital gains should be considered in the measurement of farm or household income is open to discussion (see Chapter X of this Handbook, and Hottel and Gardner, 1983; Brinkman, 1980; Hill, 2000b, 2002; Canberra Group, 2001).

At the household level, if net worth increases during an accounting period, the increase results from household savings, receipt of transfers, or changes in the market value of holdings. Given a similar starting point, households with increases in net worth are likely to be in a better longer-term financial position than are households with static or

declining net worth. In examining the well-being or longer-term viability of households, it may also be helpful to know whether any drawdown in wealth levels was planned (making use of resources accumulated in an earlier period) or involuntary (the result of some shock).

While the Canberra Group did not include the value of unrealized asset gains in either the ideal or practical measure of disposable income advanced in its report and recommendations, it did recognize that such gains could have a significant impact on household economic well-being. The Canberra Group noted that including an imputed income stream from these gains would provide additional perspective of the household's command over resources. The group also noted, however, that if the focus is on whether a household can meet its everyday needs, the relevant approach is to include only realized gains and losses on holdings. The Group recognized that collecting data needed to estimate capital gains through surveys would be difficult and would increase respondent burden. They recommended the use of a satellite account to report income estimates that included measures of capital gain (Canberra Group, 2001).

The US Census Bureau has released a satellite account that extends money estimates of income for all households in the US to include realized gains and losses (DeNavas-Walt *et al.*, 2002; Census Bureau 2007). The Census Bureau has also begun to recognise the effect of including unrealized capital gains in measures of income, at least to the extent that including an annuity based on equity held in home ownership is reflective of property holdings.

Household savings. Farming, as largely a self-employment industry, faces a variety of business and financial risks. Business risk arises from changes in production or prices, while financial risk emerges from the fixed financial commitments of the farm. Savings help add to household wealth and provide a buffer or cushion to manage either planned expenditures, such as educating children, or unplanned events, such as crop failure or a medical problem confronting a household member. For both planned and unplanned events, savings provide a source of household liquidity. In addition, accumulated savings provide a source of financial security in later life when earned income is typically lower.

Savings are a measure of flow over a defined period. In contrast, wealth is a measure of stock defined at a point in time. Savings can be measured in several ways (Juster *et al.*, 1999; Mishra and Morehart, 1998). One way is to take the difference between household income and expenditures, establishing a direct link between household earnings and wealth accumulation (see Chapter X). A second method is to sum new funds put into household assets with the amount of debt that has been repaid. Or, alternatively, savings can be measured as the difference in net worth during a period of time, revised to reflect gains or losses in asset values and transfers received by the household. Considerable difficulties with respect to survey use have been recognized for the last two measurement methods (Juster *et al.*, 1999).

Measures of household well-being. An individual's economic status has been defined as command over the potential to consume goods and services (Hill, 2000b, 2002). Measures of **economic well-being** that include all potential sources of income from the use of labour and owned assets have been calculated for households (Chase and Lerohl, 1981; Carlin and Reinsel, 1973; Wolfe *et al.*, 2004a; Wolfe *et al.*, 2004b; Salant *et al.*,

1986). In this case, the ability to acquire goods and services is viewed as being reflected not only in the money income available to the household but also by the money that could be raised by converting the household's stock of assets to income. This could be accomplished in a variety of ways, including drawing down savings, selling assets, or borrowing using assets as collateral.

The ARMS has been used to jointly consider income and wealth in assessing the economic well-being of farm households in the United States. One approach involves qualitative categorizing of household income and wealth based on median non-farm household levels of income and wealth (McElroy *et al.*, 2002; Mishra *et al.*, 2002; El-Osta *et al.*, 2007). Farm households were grouped depending on whether they had higher or lower amounts of income and (separately) wealth when compared with the median for non-farm households, and a classification derived (higher income & higher wealth, higher income & lower wealth, lower income & higher wealth, lower income & lower wealth).

Another approach yields a quantitative measure whereby estimates of wealth are converted to an annuity and the annual equivalents of annuity payments are summed with estimates of annual money income. Challenges in determining an annuity value of wealth include decisions about the length of life expectancy, rate of interest, and measure of net worth. A particular problem in determining life expectancy for households occurs when assets are owned by operators and another person or persons. In these cases it is difficult to decide whose life expectancy to use. For example, in the United States, information about farm household money income and wealth has been used to produce as well as a single indicator defined by the following formula (El-Osta *et al.*, 2007):

Economic Well-Being Indicator
=
Household Income + Annuity Value of Net Worth

This approach to derive an indicator of economic status has also been applied in Canada, Australia and the United Kingdom (reviewed in Hill, 2000b).

Formulas used to generate an annuity typically require the choice of a finite time horizon. One option is to assume that no household would consume assets at a rate that would leave household members in an impoverished state. The measure of net worth to use is also an important consideration. Farm households, like other self-employed households, own assets that provide the basis for generating current money income. To avoid double-counting, farm production assets and household durable goods are generally excluded from measures of net worth used in constructing composite indicators of well-being. Hill (2000b) discusses the valuation of owned land at the price of rented land to get over the problem and other technical issues in application of this approach that combines income and wealth in a single indicator.

Farm household portfolio composition and liquidity. Liquidity is concerned with the ability of households to generate enough funds to meet financial obligations as they

come due. It is measured by examining the farm and household balance sheets to determine whether current assets, if sold, would be sufficient to pay current liabilities. Financial analysts usually use the term "current" to mean some relatively short period of time of up to a year. The relationship between current assets and liabilities provides an indication of the amount of internal capital farm households have available for business and household operation. With households allocating financial resources to farm and non-farm uses, an accurate perspective of the amount of funds available for the business to acquire a needed input, to handle an emergency, or to repay a short-term debt may require information about both farm and household assets and liabilities.

Farm households maintain a varied portfolio of assets, though, farm assets, and particularly farmland, usually dominate their balance sheets. With diversified household portfolios, the degree of solvency of farm businesses that can draw on household assets or liquidity may be underestimated by looking solely at farm business balance sheets. Non-farm net worth may be used to relieve farm liquidity constraints. The opposite situation can arise when farm equity is used as collateral for consumption or to fund non-farm enterprises. Moving from a business to a household perspective, composition of the portfolio indicates household's use of funds and funding priorities, particularly as they move through stages of the farm-family lifecycle.

XII.6 DATA TO SUPPORT ESTIMATES OF HOUSEHOLD NET WORTH IN OECD COUNTRIES

Each segment of the farm household balance sheet has its own challenges. Work with data for all US households has demonstrated that wealth is not simple to measure (Bowles and Bosworth, 2001). Households typically have a list of assets and multiple sources of both business and personal debt (see table XII.1). The following links provide case-study material for the US.

Focus on Wealth of Farm Households in the United States

Focus on Making Estimates of Net Worth for US Farm Households

It should be noted that a multinational Luxembourg Wealth Study (LWS) now exists, forming a parallel to the Luxembourg Income Study (LIS), referred to at various points in this Handbook, which began in 1983 and has a database drawn primarily from household budget/income surveys that covers some 36 countries (2011). The LWS, initiated in 2003, covers a smaller number of countries; its website[2] lists the following countries as contributing to its database: Austria, Canada, Cyprus, Finland, Germany, Italy, Norway, Sweden, United Kingdom, and United States. The database became available to the public in 2007. The list of variables includes the industry group of the head of household. These data have been used to develop estimates of household net worth (Sierminska *et al*., 2006), wealth inequality (Jäntti and Sierminska, 2007; Davies *et al*., 2009) and combined income- and asset-based measures of well being and poverty for several OECD countries (Brandolini *et al*., 2010). However, the suitability of this data source for studying the wealth of agricultural households has not yet been tested but, as

[2] http://www.lisproject.org/lwstechdoc.htm

a general source covering all households, the number of agricultural cases is likely to be problematic in countries where farming accounts for a small (and shrinking) share of employment.

One of the few OECD countries capable of quantifying the household wealth of its farm operators, covering not only assets and liabilities associated with farming but also those held outside agriculture, is the US[3]. This Handbook regards what takes place there as an illustration of "good practice." Details are given separately as a case study, the links to which are given above. Further details about the main data source used (the ARMS farm accounts survey) are given in Chapter XIII.

XII.7 MEASUREMENT AND COMPOSITION OF HOUSEHOLD WEALTH IN DEVELOPING COUNTRIES

Statistical information on the wealth of farm households in developing countries is often surprisingly good because the basic data are collected as part of general Living Standards Measurement Study (LSMS) questionnaires. Measurement of household wealth in developing countries utilizes the same financial concept implemented in other countries. Household wealth is the difference between the value of all assets, farm and non-farm, owned by the household and liabilities owed by the household to any of a variety of lenders. Differences in estimation may lie mainly in the types of assets owned by households and the sources of debt utilized.

Information on household wealth for developing countries comes principally from separate modules within their Living Standards Measurement Study (LSMS) questionnaires, in particular those covering their (non-agricultural) household enterprises, agriculture, savings, and credit. The subsection linked below presents a brief description of the existing measurement of rural household assets and liabilities, as captured by multi-topic LSMS household surveys in a small sample of developing countries. This was assembled by the UNECE for the first edition of this Handbook (2005) and has not been updated.

Focus on Living Standards Measurement Study – Application to Agricultural Household Wealth in Developing Countries

XII.8 CONCLUSIONS

In OECD countries, while balance sheets for farm businesses are frequently encountered in association with surveys of farm accounts, information on the wider assets, liabilities and net worth of the households that operate farms is confined to a very few. This represents a substantial gap in knowledge about the economic situation of farm household-firms and one which is of significance both to agricultural policy in OECD members and to explaining behavioural responses and adjustment patterns. The

[3]Another is Italy, though the number of agricultural cases in the Bank of Italy household survey is small. Some other countries, notably in Scandinavia, appear to have the necessary basic data but do not make estimates of wealth for their agricultural households.

importance of agricultural land to the asset mix and the relevance of changes in its value to the longer-term rewards earned by its owners, in turn a reflection of the support policies applied to agriculture, makes the present information lacuna particularly worrying.

The results that are obtained for household wealth are dependent on the definitions adopted for a household and the basis of classifying them into agricultural or non-agricultural. This parallels the situation experienced when measuring incomes, and there is no need to repeat the issues covered in Chapter IX and Chapter X. A range of specific issues relates to asset identification and valuation, but a detailed exploration of these must await a subsequent edition of this Handbook. It is anticipated that the Luxembourg Wealth Study may be useful in pointing to a harmonised wealth methodology for agricultural households, performing a role similar to that of the Canberra Group in household income measurement (see Chapter X). Another similarity with income statistics is that data sources vary between countries. The extension of farm accounts surveys to cover household wealth (in addition to agricultural assets and liabilities) has attractions for some countries, though there are well-known difficulties in securing information about households from a survey based on farms (see Chapter XIII). Some countries may prefer other types of microeconomic data sources, such as administrative registers or household surveys. A detailed review of potential data is an obvious next step which a later Handbook should consider.

In developing countries, notwithstanding some non-sampling measurement error problems, the work done in the countries cited in this chapter suggests that it is already feasible to construct balance sheets for the agricultural households found there. A possible format is provided in the Focus piece to work in developing countries, the link to which is given above.

Despite the relatively limited state of development of wealth statistics compared with income statistics (though household incomes are by no means yet at a satisfactory state in many countries), it is possible to make a clear statement of the desirability of having them.

This Handbook recognises that the wealth situation of the households that operate farms should be assessed. This includes, in addition to the assets and liabilities directly related to agriculture, those that household members hold outside the farm business.

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Focus on Wealth of Farm Households in the United States

In the United States (US), wealth and the means by which farmers accumulate it have been of interest to policy officials, farmers, lenders, academics, and those with an interest in farming and rural affairs for many decades. In a 1923 American Economic Review paper, Gray reported an estimate of the net worth of farmers (Gray, 1923). This paper, prepared over eight decades ago, employed the traditional balance sheet accounting formulation: assets equal liabilities plus owner equity. Gray prepared an assessment of farm assets and liabilities to estimate net worth as the difference between assets and debt. Included in the measurement of assets were farm real estate, livestock, implements, crops on hand on January 1st, the value of growing crops, and other items of farm capital such as supplies on hand and cash needed to run the farm. Farmer liabilities included the farm mortgage and debts other than those secured by real estate. Making this paper relevant to current considerations of household wealth measurement, Gray recognized that a complete accounting of wealth required an estimate of non-farm assets, and personal loans for such items as food and clothing. To estimate the net worth of farmers, Gray moved beyond the farm business to recognize personal and household assets and liabilities.

In the US, balance sheet accounts were established for the farm sector in 1945 (USDA, 1945). Like Gray, the USDA balance sheet highlighted the need to include information for both farms and farm households. Thus, a consolidated balance sheet that included both farm and household items was developed. In 1980, the USDA created a new balance sheet account that separated the farm business and operator households. The balance sheet created in the 1940's treated the household and the farm business as a single entity. By 1980, the USDA recognized that many farmers were less dependent on farm income than previously. Likewise, household assets and income were influenced by factors outside the farm sector.

A shortcoming of the US's farm household wealth collection through the Agricultural Resource Management Survey (ARMS) is that data are collected only for the primary operators of United States farms and their households. Ideally, data used to construct household wealth estimates would provide coverage for all households contributing assets and sharing in production risks. To provide the flexibility needed to classify households, data regarding the characteristics of households, household members, and the farms they operate are also collected. This enables households to be categorized into groups needed to address specific questions.

FOCUS TABLE XII.1
Average wealth of farm operator households by farm typology group, 2008

Item	All Farms	Retirement	Residential / Lifestyle	Farming Occupation / Lower-Sales	Farming Occupation / Higher-Sales	Large	Very Large
Number of farm households	2,129,869	410,467	927,050	473,062	109,505	93,832	115,952
Percent of farm households	100.0	19.3	43.5	22.2	5.1	4.4	5.4
Total operator household assets	987,955	753,341	731,981	871,050	1,482,172	1,907,595	3,131,040
Total operator household assets: Farm	749,379	528,614	466,444	678,364	1,272,467	1,691,408	2,826,392
Total operator household assets: Non-farm	238,576	224,727	265,537	192,686	209,705	216,187	304,648
Total operator household debt	112,696	38,137	95,788	62,376	150,248	254,864	566,596
Total operator household debt: Farm	61,131	10,096	31,054	26,272	103,957	198,249	473,070
Total operator household debt: Non-farm	51,565	28,041	64,734	N.A.	46,290	56,615	93,526
Total operator household net worth	875,259	715,204	636,193	808,674	1,331,924	1,652,730	2,564,444
Total operator household net worth: Farm	688,249	518,518	435,390	652,093	1,168,510	1,493,159	2,353,322
Total operator household net worth: Non-farm	187,011	196,686	200,803	156,582	163,414	159,572	211,122

Source: http://www.ers.usda.gov/Data/ARMS/app/

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Focus on Making Estimates of Net Worth for US Farm Households

Estimates of net worth for United States (US) farm households can be developed from two major surveys: The Survey of Consumer Finances (SCF) and the Agricultural Resource Management Survey (ARMS). The SCF is a cross-section survey conducted every three years by the Federal Reserve (Kennickell, 2000). Since the focus of the SCF is on household wealth, it contains detailed questions on financial assets, non-financial assets, and debts. The SCF contains limited information about linkages between farm businesses and their households. Sample size also limits its use in examining wealth for farm households. In 2001, the latest year available, fewer than 300 farm households were included.

The ARMS is an annual cross-section survey that contains information about the farm, the farm operator and his or her household. Income, consumption, and wealth are collected concurrently from the same sample unit. Estimates of farm household wealth produced by the USDA rely on the ARMS since all types and sizes of business operations are included along with the households of the primary or senior farm operator. SCF results provide a basis for comparing estimates of wealth for farm households derived from ARMS with estimates for all United States households.

To construct estimates of household net worth, data collection starts with the farm business. The goal is to measure the value of business assets by component, to identify liabilities, and to establish ownership and control of assets used in production. The largest and most important component of farm business assets, land, is valued by asking for the values of component parts. This is done for two reasons. First, dwelling values, especially the operator dwelling, are used to impute an annual rental value that becomes a part of the estimates of income. Second, the value of land and buildings rented to, and rented from, others helps determine the amount of assets controlled in the business operation. The farm business balance sheet is completed by asking about other assets used in the business. Beginning and end of year values are determined for crops, livestock, production inputs, costs sunk into growing crops, and accounts owed to the business. End of year values are collected for items such as tractors, machinery, trucks and cars owned by the operation. For trucks and cars, an effort is made to obtain the share of their value that is associated with the farm. End of year values of assets are used in constructing the business balance sheet. Change in value from beginning to end of year contributes to value added and to the development of an accrual-based measure of business income.

Farm debt is collected next, following the organization of a standard balance sheet. First, inquiries are made about loans taken and repaid during a calendar year. Not all farms have loan balances. Many do use loan funds during the year, but repay them by year-end. Collecting information about intra-year production loans helps put interest expense reported for the farm into perspective. For the five largest loans, sufficient data are collected to estimate the amount of debt service on the loan. Details about the purpose of the loan are established, including the percent for farm purposes. These questions help align the estimate of farm debt with asset values and with business net income.

Once farm asset values and debt have been established, farm net worth is calculated by subtracting debt owed by the farm from total farm assets. When there are multiple farm households associated with a business, farm net worth is allocated among households to avoid overstating wealth estimates for any one household.

To complete an estimate of net worth for the household, the value of non-farm assets and debts are collected. As with the farm business, the ARMS is designed to inquire about household non-farm assets first. Non-farm assets are grouped into four categories: financial assets, business holdings, real estate, and other assets not reported elsewhere.

Asset values are followed by household debt owed outside the business. Like assets, debt is collected in four parts. The ARMS obtains information about mortgages on the operator's dwelling. Dwelling values are included in the farm balance sheet if the dwelling is owned by the farm. If it is not a part of the farm, the dwelling is included in household assets and debt is reported as a part of household debt. The remaining debt questions ask about other real estate loans, debt associated with other businesses that are not part of the farm, and personal loans such as credit cards, automobile loans, or any other household debts. Non-farm asset values combined with non-farm debt give an estimate of farm household net worth from non-farm sources. Household net worth is the summation of farm and non-farm components.

To facilitate collection of non-farm assets and debt, the respondent is not asked to report specific dollar amounts. Instead, respondents are asked to select from among 31 codes that reflect a dollar range. Codes for dollar categories have been used to report off-farm income, assets and debt, and consumption expenditures in the ARMS since 1986. Experience suggests that reporting codes have made questions viewed as personal less intrusive to respondents and enumerators. As a result, there is little non-response on these items. Refusal codes also help distinguish between a valid zero and a known positive (but missing) value thereby improving estimates of household wealth. Codes for dollar categories have also been used in other data collections to help facilitate reporting of household wealth data (Jappelli and Pistaferri, 2000).

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Focus on Living Standards Measurement Study – Application to Agricultural Household Wealth in Developing Countries

Information on wealth of agricultural households for developing countries comes principally from separate modules within their Living Standards Measurement Study (LSMS) questionnaires, in particular those covering their (non-agricultural) household enterprises, agriculture, savings, and credit. This subsection presents a brief description of the existing measurement of rural household assets and liabilities, as captured by multi-topic LSMS household surveys in a small sample of developing countries. This information was assembled by the UN Economic Commission for Europe (UNECE) for the first edition of this Handbook. Data relating to agriculture and other forms of activity are covered separately. This account starts with non-agricultural productive assets and liabilities, and moves through savings and credit modules.

1) Household enterprises module

Among developing countries LSMS questionnaires mostly contain a module exploring the dynamics and activities of **non-agricultural household enterprises** (which, for simplicity, are referred to in chapter 18 in Grosh and Glewwe (2000) as "household enterprises"). These modules gather information on the portion of a household's income and employment derived from non-agricultural self-employment. More extensive versions have also collected information on the involvement of household enterprises with credit (Vijverberg and Mead, 2000). Most household enterprises fall into one of two major categories: Many, probably the majority, of these enterprises generate only minimal income that is barely sufficient to enable their owners to survive; examples are food preparation, sewing, shoe shining, and street vending. Other household enterprises, sometimes referred to as *micro-enterprises*, generate incomes that are substantially higher. In contrast with survivalist enterprises that rely almost exclusively on unpaid family members (and often consist of one person working alone), micro-enterprises are more likely to use hired workers. Examples of micro-enterprises are furniture making, manufacturing, and wholesaling (Vijverberg and Mead, 2000).

Business assets are an important determinant of the performance of an enterprise. Enterprise performance can be measured not only by labour productivity or by the absolute amount of income generated but also in terms of the percentage return to investments in the enterprise. And an enterprise's start-up and subsequent performance depend heavily on the entrepreneur's ability to acquire the assets needed to be competitive in the sector. If one of the purposes of a particular survey is to investigate the credit needs of small-scale private enterprises, it is important to collect information about business assets.

Business assets come in two forms: fixed assets and inventories. **Fixed assets** include land, buildings, tools, machinery, furniture, and vehicles used by the labour force. **Inventories** consist of raw materials, intermediate goods that need to be further processed, and finished products ready for sale. While recent enterprise income can be analyzed using the current value of business assets, in order to analyze income over 12

months, additional information on sales and purchases of assets is needed.[1] For land and buildings, any expenditure on improvements may be counted as assets purchased. The "normal" quantity of inventories is difficult if not impossible to measure, hence the LSMS questionnaires ask only for current values. Asking for current market value of assets is a common practice in preparing balance sheet estimates for businesses and households.

For many purposes, the most important question about fixed assets is not so much what assets are **owned** by the enterprise but rather what assets it **uses**. An entrepreneur may rent, own, or borrow assets from a neighbour or relative or from another enterprise operating in the household. Experience with previous LSMS data sets indicates that a significant proportion (about one-fourth) of household enterprise owners report owning no assets, and those that do own assets often share them with household members or with other household enterprises; this is particularly the case with vehicles. If an asset is shared, it contributes not only to the income of the enterprise that owns it but also to the income of other enterprises that use it or to general household welfare. In light of this fact, it is necessary to devise a way to account for the complex sources and uses of business assets (Vijverberg and Mead, 2000).

[1]Assuming that transactions took place on average a half year ago, the typical value of business assets in use over the past 12 months can be approximated by the following:
([current value of assets] + [value of assets sold])/2 – [value of assets purchased]/2.

FOCUS BOX XII.1
Modules on (non-agricultural) household enterprises

The **China** Living Standard Survey (CLSS), 1995-97, gathered data on household non-farm businesses for the *three* most important enterprises operated by the household. It collected data on the ownership, type of business, investment and its sources for each enterprise. It also recorded information on **assets** and inventory.

The **Côte d'Ivoire** Living Standards Survey (CILSS), 1985-88, collected information on the *three* most important businesses per household. Information on **the value of productive assets and stocks** was also recorded.

The **Ghana** Living Standards Survey round four (GLSS 4) 1998/99 gathered information on **assets** of the non-farm enterprise and solicits information on "net income and inventory of enterprise".

The **Moroccan** Living Standards Survey (MLSS), 1990-1991, provided information on the identification of home enterprises; on fixed-place (home or shop) enterprises expenses; ambulatory enterprises expenses; enterprises with formal accounting procedures receipts; enterprises without formal accounting procedures receipts; capital and loans.

The **South Africa** Integrated Household Survey (SAIHS), 1994, asked about whether any member of the household owned other property or a share of other property (e.g. business property); how much it was worth; and whether any rent was being received.

The **Vietnam** Living Standards Survey (VLSS), 1997-1998, collected information on ownership, sales and purchases of **assets** and other durable goods.

The **Zambia** Living Conditions Monitoring Survey (ZLCMS), 1996, asked about what assets the household owned. This referred to **household assets** in good working condition and used by the household in the production of goods and services. In the event an individual was running more than three activities the respondent was asked to specify up to *three* of the most important business activities.

2) Agriculture module

The agriculture module in LSMS surveys includes only the activities of the farm that involve crop (annuals and perennials) and livestock production. It omits hunting, fishing, and gathering activities as well as the processing of agricultural products. Those activities can be treated as non-farm enterprise activities and should be included in the household enterprise module of an LSMS.

The agricultural module has generally had several objectives: measuring net income from the household's production of crops and livestock; and measuring **the value of household agricultural assets** such as land, animals, and equipment etc. (Reardon and Glewwe, 2000).

FOCUS BOX XII.2
Modules on agriculture – selected developing countries

China recorded information on different **agricultural inputs and agricultural assets,** e.g., farm machines and equipment.

Côte d'Ivoire recorded for each type of livestock the number of and value of **livestock** currently owned and the number of and value of livestock sold, purchased and lost over the past year. It asked for a list of the main small **tools** used and owned by Ivorian farmers. It also asked about the value of the current stock of each type of **farm equipment** (not tools) such as tractors, carts, vehicles and draft animals

Ghana covered **agricultural assets** such as land, livestock and equipment. The land referred to covered all **land owned** by the household whether for agricultural or non-agricultural purpose, including land rented out to other persons.

The **India** – Uttar Pradesh and Bihar – Survey of Living Conditions (ISLC), 1997-1998, sought information on livestock owned and **farming assets** owned.

Morocco asked about the size and current value of the land plots; the ownership and income of livestock; and agricultural equipment and loans.

Peru asked about the market value of any agricultural equipment that was owned.

South Africa asked about the persons in the household having the right to use (having access to) any land for arable farming or for stock farming. It also asked whether the household owned, or farms with, any **animals** and sought information on the presence of poultry of any kind. Furthermore, it asked whether the household owned mechanized **farm equipment** or non-mechanical farm **tools**.

Vietnam collected information on household's control over different plots of **land of different tenures**. It collected information on **livestock, poultry and other animals** that were either consumed by a household or generated income. It collected information on **hand tools**, and information on **implements and farm machinery** owned by the household, and any rental revenues obtained from them.

3) Savings module

The savings module is an essential part of a multi-topic household survey like the LSMS. This module gathers data on **the value of the household's stock of financial assets**. Such data are necessary to accurately estimate **household wealth**. And the savings module can collect information on both the types of financial assets held by households and recent transactions in such assets during the period of the survey, providing information that is directly relevant for analyzing household savings (Kochar, 2000).

The savings modules in most multipurpose household surveys (including many LSMS surveys) typically collect information only on **financial assets and liabilities**. The data set generally includes information on the household's **non-financial assets** in other modules of the survey (Kochar, 2000).

It is widely believed that **the low return on assets** in developing economies partly reflects the fragmented nature of capital markets and, hence, the inability of households to hold assets that yield the highest rates of return. The levels and (especially) the forms in which households save affect household incomes, particularly in countries where agricultural or non-farm enterprises constitute a major source of household income (as is the case in most developing economies).

Income from agricultural or non-farm enterprises reflects, in part, the household's **ownership of physical capital or "productive" assets** such as the machinery and tools used in such enterprises. Investment in such assets represents an act of saving, thereby linking savings and portfolio choices to household income (Kochar, 2000).

As noted above, there are alternative ways to measure savings: two of these are by subtracting consumption from household income or by observing changes in stocks of individual assets. For this reason, data on financial assets are best collected in the savings module. There are **difficulties** inherent in each of the two ways of measuring savings. A lack of data on important assets is a problem when measuring savings using data on asset transactions. And the difference between income and consumption does not always provide a reasonable estimate of savings, often because of weaknesses in the design of the income and consumption modules (Kochar, 2000).

Data on stocks of assets are also necessary to estimate **household wealth**. Experience has shown that the accuracy of estimates of household wealth can be improved if households are asked about the value of different types of assets rather than being asked to provide an estimate of their total wealth (Kochar, 2000).

FOCUS BOX XII.3
Saving modules

China asked the household to list different places (e.g., banks, credit union, loan to enterprises) to put away money which will not be used for a while, and to estimate the maximum amount of money that could be taken from own assets when faced with, for example, some kind of disaster or the need to build a new house.

Côte d'Ivoire recorded the total value of all savings.

Ghana collected information on loans, assets and savings information about the household's savings account and the current value of savings was collected.

The **Jamaica** Survey of Living Conditions (JSLC), 1997, included questions about how often the respondent saved, financial assets, and other assets.

Vietnam asked households to list different **types of savings**, if any. The respondent was also asked to total the current value of all the different forms of savings that he/she has.

4) Credit modules

Not covering all of the sources and types of credit in a multi-topic household survey can lead to serious mis-measurement of credit use. Thus it is essential for surveys to ask questions about every conceivable source and variety of credit to ensure that the full extent of credit use is accurately measured. While basic information on borrowing has been collected in many past LSMS surveys, few surveys have included detailed questions about credit sources or even general questions about using supplier credit for productive purposes. Questions on the use of supplier credit have most frequently been found in inquiries about agricultural enterprises, but even in these cases very few questions were included (Scott, 2000).

Analysis of the data from the few surveys that have addressed this issue in depth have shown that it is vital to include explicit questions about the sources and types of credit and about the purposes to which it is put (see table XII.2). Only when these questions are included will surveys yield enough data to give an accurate picture of total credit use (Scott, 2000).

FOCUS TABLE XII.1
Types of Credit Information Obtained by Selected LSMS Surveys

	LOANS					TRADE CREDIT				
				By source			Non-Agricultural		Other	
COUNTRY	Mortgage	All loans	Specific loans	Implicit	Explicit	Agriculture	enterprises	Food	consumption	Service
Ecuador 1994	○		●[a]	●						
Ghana 1987/88	○	●	●	●		●				
Ivory Coast 1985	○	●	●	●		●				
Kyrgyz Rep. 1996	○	●	●	●		●	●		●	
Peru 1985	○	●		●						
Pakistan 1991	○	●	●	●		●	●	●		
South Africa 1994	○	●		●	●			○	○	
Vietnam 1992/93	○	●	●	●		●				

○ Indicates that the questionnaire contained through questions on this topic
● Indicates that the questionnaire partially covered this topic
a Only agricultural loan was collected

Note: This table only shows whether each questionnaire included questions asking if the household had obtained credit of a specific type. The table does not show whether the design of the questionnaire would yield the data necessary to calculate the size of the loan, the total cost of credit, or other loan terms.

Source: Relevant LSMS questionnaires.

FOCUS BOX XII.4
Credit modules

China collected general information on the number of different sources the household had ever borrowed money from. Information on the amount of the loan, interest, collateral requirement, repayment schedule and reason for borrowing was requested for each instance of borrowing. The survey also gathered information on enterprise **debt and its structure** (e.g., bank loan, loan from collective or cooperative foundation, and private loan).

Côte d'Ivoire recorded the total amount of **loans** provided by the household to others, total amount **borrowed** from institutions or from other people.

Ghana obtained information on loans contracted or negotiated by the household in terms of money or goods.

India aimed at ascertaining **the net debt position of the household**. The total amount currently outstanding that the household owed to others was also recorded.

Morocco asked questions about borrowing, lending and savings.

Peru asked about any financial transaction undertaken in the last 12 months; the amount of the **loan** remaining to be paid.

South Africa asked whether any member of the household **owed cash or goods** to any institution or to an individual who was not a household member; the amount owed; and the monthly payment.

Vietnam collected information on the amount of **indebtedness** of household members to people or institutions outside of the household. If money or goods had been borrowed, or borrowed and repaid by any household member in *the last 12 months*, information was collected on those loans, including the source and amount of loan, interest, side payments, collateral, repayment schedule, reason for borrowing, and number of loans from the same source. It also collected similar information on the amount household members had lent to people outside of the household.

SUGGESTED HOUSEHOLD BALANCE SHEET FOR DEVELOPING COUNTRIES

Building on the above information, in the first edition of this Handbook the UNECE suggested a households balance sheet appropriate to developing countries, as shown below.

FOCUS TABLE XII.2
Household Balance Sheet

ASSETS	LIABILITIES AND TOTAL NET WORTH (Owner's Equity)
Current Assets (Short-term liquidity):	*Current Liabilities (Short-term):*
Cash/currency	Accounts Payable
Financial assets/securities(stocks and bonds)	
Current value of all savings forms	
Money or goods lent to other institutions or people outside household	Sales Taxes Payable
Value of the crop output retained as seed (stock of grain)	Payroll Taxes Payable
Accounts Receivable	Accrued Wages Payable
Total Current Assets	Dividends Payable
Inventories (liquid assets)	
Raw materials	Unearned Revenues
Intermediate goods/products	Short-Term Notes Payable
	Short-Term Bank/Credit Union/Cooperative/Money
(Value of) Unsold (finished) goods/product	Lender Loan Payable
Total Inventory	***Total Current Liabilities***
Non-farm Assets	
Fixed (long-term) Assets:	*Long-Term Liabilities:*
Land	Long-Term Notes
Buildings (business or commercial property)	Payable Mortgage Payable
Tools	Long-Term Bank Loan
Machinery	Amount owed for leases
Furniture	Bond Repayment
Vehicles	Deferred Taxes
Equipment	
Depreciation (Machinery)	Other obligations not requiring interest payments
Durable (consumer) goods	
Housing	
Other Durable Consumer Goods Items	
Total Long-Term Non-Farm Assets	***Total Liabilities***
Farm (Agricultural) Assets	
Agricultural Land	
Owned	Owner's Equity (Net Worth)
Mortgaged	Capital/Common Stock
Rented/Sharecropped	Net Profit
Rented out	Retained Earnings
Animals	
Value of Livestock	
Value of Poultry	
Drafts Animals	
Bullocks	
Farm Equipment	
Tractors	
Carts	
Vehicles	

Mechanical Plough	
Pump	
Mill	
Food Processor	
Trailer for Truck/Tractor	
Trolley	
Fodder Cutting Machine	
Generator	
Non-Mechanical Farm Tools (Implements)	
Hoe	
Spade	
Durable Equipment for Storage	
Total Farm (Agricultural) Assets	***Total Net Worth***
TOTAL ASSETS	**TOTAL LIABILITIES+TOTAL NET WORTH**

Source: UNECE. (work by Christian Kingombe)

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CHAPTER XIII

INVENTORY OF METHODOLOGIES USED AGRICULTURE INCOME AND WEALTH STATISTICS

This chapter reviews the existing methodologies used to generate income and wealth statistics for agricultural households, elaborating issues touched on only briefly previously in this Handbook. First there is a review of the sorts of basic data sources that may be available, with their respective strengths and weaknesses. This is followed by an account of the definitions applied and data used in a range of countries. This is in two parts. The first describes the situation in developed countries (members of the OECD and/or UNECE). The second deals with a sample of developing countries. Both parts draw on information gathered by the UNECE especially for the first edition of this Handbook (2005), augmented with other more recent research.

XIII.1 DATA SOURCES FOR STATISTICS ON AGRICULTURAL HOUSEHOLD INCOME – GENERIC SOURCES

The lack of basic data has for long been a problem in establishing statistics on the economic situation of agricultural households. In 1964, the OECD examined the issue of low incomes in agriculture. As part of this investigation, the OECD attempted to collect information from 22 member countries on the incomes farmers received from other sources and which might compensate for low earnings from farming. To its concern it found that:

> *"…In most countries, the information available does not give a precise indication of the farm income situation. Farm families cannot be accurately classified according to their level of income; data on income received from non-farm sources are particularly deficient. These limitations are a serious handicap in devising suitable policies and in assessing the results of measures taken; attention should be given to improving the situation"* (OECD, 1964, p.7).

Although scraps of information about off-farm activities could be found for most countries, comprehensive sets of microeconomic income data that permitted the identification of farms with low total incomes were only encountered in the Scandinavian countries, Austria, Germany, Canada and United States.

Slattery (1966) reviewed what was known on the relative income of farmers up to the mid-1960s in seven countries where data on personal incomes could be found (Denmark, Germany, Sweden, United States, Canada, Australia, and New Zealand – the latter two not covered by the OECD work above). Tax records formed the prime source except for Germany where farm accounts were used. Slattery's analysis related to the average incomes of farm and non-farm sectors and did not explore the distributional issues for which such data are particularly suited. In 1989, Hill noted that in the EU, despite the passing of three decades during which the CAP, with its increasingly important income objective, had come to dominate the agricultural policies of Western Europe, the list of Member States with satisfactory micro-data on the overall income of their farming households was almost unchanged from that found by the OECD in the 1960s. Only Ireland and the Netherlands had been added to Slattery's list. The absence of countries of such major importance to the CAP as France, Italy and United Kingdom was particularly regrettable. By 2000, virtually no progress had been made in putting what patchy data existed at the national level on to a common methodological basis that would permit comparison and aggregation (Hill, 2000). A review in 2007 for Eurostat of the feasibility of constructing reliable estimates for the incomes of agricultural households across the EU using a common methodology (AgraCEAS, 2007), considered existing data sources in the 27 Member States, tested whether they were capable of supporting estimates that used a common methodology (based on recommendations of the first edition of this Handbook) and proposed ways of filling data gaps. Clearly it was the lack of basic data rather than problems with definitions and other methodological issues that was the constraining factor in the development of statistics in this area and the main reason why costs would be incurred in building a system for the EU as a whole.

Before moving to the methodologies currently used in countries at various stages of economic development it is useful to describe the main data sources and their various strengths and weaknesses. It must be remembered, however, that while the existence of data is a prerequisite for the creation of statistics, it does not necessarily mean that they can be used for this. There may be practical or legal impediments to be overcome and, even when these can be circumvented, resource costs are involved.

XIII.1.1 TYPES OF DATA SOURCES

Microeconomic information on the personal incomes of farmers and their households comes from data gathered in three main ways:

1. surveys of farm accounts;
2. taxation records where self-employed farmers can be identified as a trade group within the industry classification system. Alternative ways of determining an agricultural household were considered in Chapter IX;
3. family (household) budget surveys in which farmers form an identifiable socio-professional group, typically one among many such groups.

Each is considered in more detail below. The first two are characteristics of OECD countries. Most of these have **farm accounts surveys** though their coverage of incomes from non-agricultural sources is by no means universal because of a mix of historical and political circumstances, requiring the use of alternative ways of collecting this information. Similarly, while **tax records** often exist, they are often unsuitable as a data source on household incomes. Principally this is because such records reflect the taxation system applied to agriculture, and the fact that in many OECD countries farmers are treated specially for tax purposes. Often farmers do not have to submit income accounts but pay on an area-linked flat-rate basis, so what appears in tax records is no guide to actual income levels (OECD, 2005). There are also many other technical problems (see below). **Household surveys** are the main (perhaps the only) source of income data in developing countries, where farm accounts surveys or taxation records may not exist. However such an "institutional" orientation in surveying agricultural households has shown some methodological shortcomings, including problems of coverage of self-employed farmers and accuracy of income data, described more fully below. Furthermore, in OECD countries the use of household surveys is constrained because farm households represent only a small proportion of total household numbers and therefore often appear in general household surveys in too small numbers for results to be reliable.

In addition, there are various other **country-specific sources**. Some are regular, as in the annual micro-census in Germany or claims for income support under welfare programmes in Ireland and France, while others are occasional, like the investigation of farming households in Luxembourg in 1978 by the Centre for Population and Policy Studies (CEPS) (Hill, 1988) and the special studies in France by the *Centre d'étude sur les revenus et les coûts* (CERC) for 1978 (Brangeon *et al*., 1991; Jégouzo *et al*., 1998) and for 1997 and 2003 by the National Institute for Statistics and Economic Studies (known by its French acronym - INSEE) (Berthier, 2004 and Chapter XIV). Occasional data also come from special studies that involve looking at the incomes of farmers, such as surveys of farm business structure, of part-time farmers and the large-scale multi-country study of farm household adjustment in Europe undertaken by the Arkleton Trust (Bryden *et al*., 1992) and its national offshoots. Here emphasis is given to the regular sources.

XIII.1.2 FARM ACCOUNTS SURVEYS

Surveys of farm accounts are important for several policy purposes (such as for monitoring the incomes from farming, for tracking responses to economic and administrative signals, and as a component in the estimation of national income) and, because they are mostly undertaken either by or for governments, form part of the official data set on agriculture. Examples include the national surveys of farm accounts that contribute to the European Commission's Farm Accountancy Data Network (FADN, also known by its French acronym RICA)[1] and, in the US, the Agricultural Resource

[1]According to the EU Farm Structure Survey less than one third of holdings kept accounts in 2000 (31% in 2000 for ten Member States of EU15, though this was up from 15% for nine countries two decades earlier). In some countries it was virtually universal (including Denmark, the Netherlands and the United Kingdom), whereas in Greece only 1% of holdings kept accounts; in Austria it was 5% and in Spain 11%.

Management Survey (ARMS). The quality of the information is generally high because of the ways in which the sample is selected and the data collected. However, as suppliers of data on the total income of farm households, such surveys are of limited potential. First, the sample is designed to be representative of agricultural activity, not of farming households. Hence there may be a concentration on the larger "commercial" producers and relatively poor coverage of small "non-commercial" farms, even if the occupiers of such holdings are mainly dependent on the farm for their livelihood. A minimum size of farm may be used that cuts off a substantial proportion of farm operators[2]. This has led to criticism of the EU's FADN/RICA for its limitations with regard to exploring issues that relate to people engaged in agriculture (see views reported in Hill, 1988).

In addition, official farm accounting is often restricted to inputs and outputs of agricultural activity. For example, the FADN/RICA does not require information to be gathered beyond that related to the farm business. Such a narrow perspective, though perhaps appropriate to the problems of farming at the time the data systems were set up, restricts the capacity of the survey in providing answers to many of today's policy questions. In the EU a few national surveys go further and regularly collect additional data on the farm household's non-farm income, though there may be a problem in achieving high data quality across the various sources; among the EU-27 countries this list currently includes only seven Member States (Denmark, Germany, Italy, Netherlands, Austria, Poland and the United Kingdom) with the position of a further one (Lithuania) not clear (AgraCEAS, 2007). In contrast, in the US the ARMS covers both the farm and non-farm income and wealth of operators. Data from the ARMS have proved highly valuable in analyses of the economic conditions of operator households (the ARMS is treated as a case study in Chapter XIV).

A further issue with farm account surveys is that, by virtue of their nature, they do not generate data on other socio-professional groups with which comparisons of the economic situation of farm households could be drawn. This means that alternative data sets may have to be used to provide results for the population in general or subsets of it (such as households headed by other self-employed persons), with the possibility that full comparability may not be achievable.

Nevertheless, in countries where the official farm accounts survey extends to economic interests outside the farm (that is, coverage relates to the complete institutional unit rather than just the "fictional" farm business), these represent a generally robust source of data. In other countries where information on the farm household and its income is lacking, farm accounts surveys appear to be an attractive option for development by adding questions related to off-farm income, non-farm wealth and other aspects of the household that are of increasing relevance in explaining farm decisions and establishing the economic well-being of farm households.

At least three reasons can be suggested to support as a "good practice" the use of "industry oriented" surveys in gathering information on the total income of agricultural households. First, the specific, technical focus on production that characterizes surveys oriented to agriculture as an industry is likely to lead to more reliable estimates of

[2]In the EU the FADN/RICA, covers about 98% of activity but only about 50% of operators.

mixed income from farming than the sector (institutional) oriented ones. Not surprisingly an ongoing research project in Sub-Saharan Africa, aiming to improve the quality of households-level data on agriculture gathered by survey recognizes the need for "… interviewer with more knowledge on agriculture" (World Bank, 2008: 21).
Furthermore a good estimate of mixed income from farming, grounded on detailed technical information on farming activities, could facilitate the valuation of the other sources of income on a comparative basis, all the more reason when farming is the major source of income of the household. Moreover, given that often the agricultural holding represents a major asset for the farming households, the technical focus of the (industry oriented) survey could represent a good basis for an assessment of the household wealth too.

Finally, an appropriate statistical coverage of agriculture as an industry is likely to lead also to a sample of "agricultural households" with desirable statistical properties, whatever the definition adopted (Rocchi, 2010).

XIII.1.3 TAXATION RECORDS

Taxation records form a main potential data source on the total personal incomes of farmers and their households. In countries that have income taxes for individuals or groups of people (such as couples, who may form a fiscal household), an advantage of using taxation records is that taxes are not voluntary, so records of the income on which tax is based should exist for all taxpayers. Data may be drawn from the whole universe or just a sample depending on the number of cases and degree of disaggregation required. Because there are usually penalties for illegal tax avoidance, some degree of quality assurance is built in, though there may be bias towards the under-reporting of income. Assuming that taxpayers are identified by trade group, of which agriculture could be one, it should be possible to compare the situation of farmers with other classes of taxpayer.

However, there are many substantial drawbacks. First, tax records relate to concepts of income (and assets in some situations) used by tax authorities, and these may differ from those used by economic statisticians. For example, some forms of income may be deemed to be exempt from tax and are thus likely not to appear in income registers. In addition, rules on matters like capital allowances, offsetting losses and so on may not accord with the treatment appropriate for assessing personal incomes in the context of agricultural policy.

Second, low-income farmers may fall below the tax threshold and thus not be represented in statistics based on taxes (Ireland is a case in point - see Hill, 1988). This will complicate comparisons of income with other socio-professional groups.

Third, the system of taxation of agriculture may be different from the rest of the national system, so that income data may not be available. For example, in many OECD countries (including not less than thirteen of the EU-27) at least some farmers (typically the smaller ones) are not taxed on their actual incomes but according to some standard - usually dependent on farm area or numbers of animals (OECD, 2004). Accounts based taxation only applies to all farms in a handful of countries (including Denmark, Netherland, Finland, Sweden and the United Kingdom) (AgraCEAS, 2007). Assessment

on an actual income basis can only happen if the farmers keep accounts for their businesses; as was noted above, for the EU as a whole this seems to be still very much the exception.

Fourth, there may be a problem of timing. Where tax is assessed on the basis of an accounting profit this may be done in arrears, unlike other forms of income that are taxed in the year in which they are earned. Consequently there may be problems of aligning information on self-employment income with statistics on other income. Similarly, some systems allow farmers to draw up tax accounts on a cash basis rather than on accruals.

Fifth, there may be implications with respect to the institutional form the farm business takes; arranging a business as a company rather than as a partnership or sole-trader will impact the way that income is reported and taxed.

Sixth, there may be practical or legal reasons why tax data are not available or appropriate. These range from technical difficulties, such as matching up the income declarations of individuals to create data for households, to legal restrictions in some countries on access to tax data for non-taxation purposes, even by statistical authorities.

Nevertheless, in situations where it is possible to combine tax data for individuals with other administrative and survey data, the outcome can be a valuable and powerful tool for studying socio-economic problems and monitoring the performance of policy directed at solving these problems. This is the case in some Scandinavian countries where the combination of tax data and other forms of data constitutes their Income Statistics Registers.

XIII.1.4 FAMILY (HOUSEHOLD) BUDGET SURVEYS AND LSMS

These surveys and related panel studies are a further potential source of data on the incomes of agricultural households. General household budget surveys cover all households, including agricultural ones. As a result, in theory comparisons should be possible between agricultural households and other types of household. However, there seems to be a sharp divide in ability to be used in practice to provide income data. Among OECD countries, though national household budget surveys are found universally, they are often handicapped by lack of numbers of farm households. However, as will become clear, in developing countries case numbers are not a problem and they have become a dominant form for collecting socio-economic data, supplementing or sometimes even replacing other data collection programmes and civil registration systems (UN, 2005). Important indicators to inform and monitor development policies are often derived from such surveys.

There are three main disadvantages of household budget surveys. First, there is the issue of **statistical coverage**. A sample optimized to correctly represent the whole households sector in the economy could be unsuitable in surveying the agricultural sub-sector (both in general and when only rural areas are considered). This takes several forms:

- The “agricultural” part of the institutional sector is likely to be **under-represented**, especially in relatively high-income industrialised economies,

where agriculture employs a minor part of the labour force. As already noted, in OECD countries few agricultural cases turn up in the surveys and as a result, the data are often insufficient for any statistical significance to be attached. Also, under-representation of self-employed households in voluntary surveys typically reflects difficulty in making initial contact and a high non-cooperation rate,

- Where the distribution of agricultural households with reference to the variables used in the sample stratification was different from the average, the "agricultural" sub-sample would be also **biased.**
- The sub-sample of farming households is not likely to properly represent agriculture **as an industry** (that is, the aggregate output of units producing agricultural commodities): a bias toward small (household managed) production units is likely to emerge (World Bank, 2008: 23). This will be of particular concern where the survey is used to generate production statistics.

Second, they are **expensive** to carry out, with the result that they are conducted only occasionally - typically in OECD countries at five to seven year-intervals. This creates the problem of how their findings should be updated in non-survey years. In addition, results from the analysis of the mass of data also tend to be rather dated by the time they are published. These surveys are therefore best at providing detailed information when time is not of the essence.

Third, the data obtained on income often **are not of high quality** (see, for example, the case of Greece in Sarris [1996]). Not all items leading to income may be collected (such as imputed items and rental values of owned dwellings) and there may be no coverage of assets, liabilities and net worth. In OECD countries underestimation of income is commonly found. This may not be deliberate but can arise from the uncertainty which households have about the amounts they are earning from farming and even of what constitutes income (Martin *et al.*, 1996; Van der Laan, 1999). Ireland has attempted to circumvent the problem of data accuracy at the farm household level by integrating their household survey with the annual farm accounts survey (the National Farm Survey) that contributes to FADN/RICA, selecting as agricultural households cases that were already cooperating in the National Farm Survey (Hill, 1988). In Germany, incomes are estimated indirectly by summing consumption spending with the level of savings.

Under-reporting, relative to consumption, is also a characteristic of developing countries. A review by FAO and World Bank RIGA[3] project staff covering 17 developing and transition countries (Azzarri *et al.*, 2010) found that the observed differences between income and consumption were extremely large, being on average 31 percent and in four cases over 50 percent (the maximum value being 72 percent). There was also evidence that underreporting was systematically associated with some individual, household and survey characteristics. Older, less educated household heads tended to underreport income more. The degree of underreporting appeared to be strongly associated with the income source, analysis identifying very clearly that agricultural

[3]Rural Income Generating Activities project, The RIGA project created an internationally comparable database of rural household income sources from existing household living standards surveys. Most of the surveys used by the RIGA project were developed by national statistical offices in conjunction the World Bank as part of its Living Standards Measurement Study. The data are available to the general public.

income was the component suffering more than any other components from underreporting. Within developing countries Living Standards Measurement Surveys (LSMSs) (see Chapter VII) often experience difficulties in eliciting income from self-managed production activities, especially when a systematic bookkeeping is not carried out (McKay, 2000). A particular issue with *farming* activities is that the LSMS "agricultural" module has been rarely implemented in developing countries, often due to practical problems such as the different recall period (end of cropping period) with respect to the other modules of a multipurpose survey. Not surprisingly, when used for the analysis the collected data have led researchers to quite mixed results (Reardon and Glewwe, 2000).

Longitudinal studies using a **panel** of households are needed where the main interest is the way in which income varies over time and the way in which various components change. The pattern by which many agricultural households diversify their income sources as a response to the pressure on the rewards from farming would be expected to be revealed by the use of constant samples. In reality, general surveys of households that use a panel approach often appear to suffer from the problem of small numbers of agricultural cases. The link below contains details of panel surveys for the EU (the latest manifestation of which is EU-SILC, which for some Member States such as Poland can be the basis of income statistics for their agricultural households (see Chapter XIV).

Focus on the European Community Household Panel (ECHP) and Community Statistics on Income and Living Conditions (EU - SILC), now renamed Income, Social Inclusion and Living Conditions (EU-SILC)

Focus on Data Sources for Statistics on Agricultural Household Incomes in 27 EU Countries (based on AgraCEAS 2007)

Among OECD countries there have been moves towards a common methodology for household budget surveys both within the EU and internationally (Canberra Group, 2001; Eurostat, 1993; 2003). Their primary purpose has been to provide information for the weighting of price indices, and emphasis has traditionally fallen on the expenditure side. Despite this, the amount of information collected on incomes has gradually been expanding, though there is variation in the amount of detail among countries. This flows from the fact that income data are collected primarily to obtain a classifier for the study of patterns of consumption rather than to study income in its own right (Eurostat, 1993). Nevertheless, in countries with a substantial proportion of their population still engaged in agriculture, these surveys are a potentially valuable source of information on the total income of farmer households. The OECD used data from household budget surveys in 25 countries stored in the database of the Luxembourg Income Study as the basis for its study of low income in agriculture (OECD, 2001)[4].

[4]The Luxembourg Income Study (LIS) project began in 1983 under the joint sponsorship of the government of Luxembourg and the Centre for Population, Poverty and Policy Studies (CEPS). The main objective of the LIS project was to create a database containing social and economic data collected via household-based surveys in different countries. By early 2011 the LIS database had expanded to contain information for 36 countries.

For developing countries, since 1970 several major international programmes have been organized to support the collection of household survey data. Among the largest such programmes have been the United Nations Household Survey Capability Programme (UN, 2005), and the World Bank's Living Standards Measurement Study (LSMS).

A series of over 60 LSMS surveys has been carried out under the aegis of the World Bank in over 40 countries. The methodology of the LSMS surveys, which gather data on many aspects of household welfare, was developed by the World Bank in order to provide policy-relevant household level data for evaluating the effect of a variety of government policies on the living conditions of the population. Because of the substantial variation in the contents of the surveys it is important to scrutinise the LSMS Information Table. The Basic Information Documents contain information on the purpose of the survey, sample design, organization of the survey team, names of original and constructed data files, and codes not contained in the questionnaires. Over time, LSMS surveys have become increasingly customized to fit specific country circumstances, including policy issues, social and economic characteristics, and local household survey traditions (Grosh and Glewwe, 2000a). The principal implementing agency is usually the national statistical office (NSO) which takes the lead in questionnaire design, sample design, and fieldwork methodology using the techniques found by the LSMS to be most effective (Scott *et al*., 2005).

LSMS surveys have several characteristics that distinguish them from other surveys. First, and perhaps the most important, is that they use several questionnaires to collect information about different aspects of household welfare and behaviour. Second, they typically have nationally representative, but relatively small, samples - usually between 2,000 and 5,000 households. This only yields accurate descriptive statistics for the country as a whole and for large sub-areas (such as a division into rural and urban areas) (Grosh and Glewwe, 2000a). Third, because of the complexity of most LSMS surveys, they have rigorous quality control procedures to ensure that the data they gather are of high quality. These procedures are generally difficult to implement on larger samples (Grosh and Glewwe, 2000a).

Despite the success of the LSMS programme, several challenges remain for LSMS surveys and other multi-topic household surveys. First and most obviously, many developing countries still have inadequate household survey data. This is true even for some of the countries that have recently fielded new surveys. Ideally, all governments should collect data on a regular, ongoing basis in order to monitor poverty trends over time. However, survey efforts are still sporadic in many developing countries today, and many surveys have serious deficiencies such as limited questionnaires, samples that exclude rural areas, and long delays in processing the data after completing the fieldwork.

Second, improvements are needed in the process of adapting the LSMS approach to countries that have not yet implemented LSMS-type surveys.

Third, the data gathered from some parts of LSMS survey questionnaires have been disappointing. Two particularly difficult problems entail the measuring of household

income from agriculture and non-agricultural self-employment and the measuring of savings and financial assets (see Chapter XII of this Handbook).

Fourth, new issues have emerged since the first LSMS surveys were implemented. The economics profession has increasingly discounted the notion of the household as a unified decision making body, trying instead to understand how goods, services, and power are allocated among the different members of a given household (Grosh and Glewwe, 2000a).

Focus on Data Sources and References for Data of Developing Countries

XIII.2 UNECE SURVEYS OF 2004 AND 2005 ON DEFINITIONS AND MEASUREMENT ISSUES IN SELECTED COUNTRIES

In March 2004, the UNECE contacted its Member countries and those OECD countries that are not UNECE Members asking for key definitions, data sources and other information concerning the collection of statistics on the income of agricultural households. The emphasis was on what was already used in available statistics rather than what might be possible within national data systems. For EU countries the findings have to some extent been superseded by the later feasibility study of rebasing income statistics on microeconomic data sources and using a uniform methodology (AgraCEAS, 2007), but the UNECE findings are reported here because of their wider coverage, including some developing countries.

Because Eurostat had already collected information for an inventory of the definitions used and methods employed in EU Member States to estimate income results for agricultural households as part of its IAHS project (that was suspended in 2002), these countries were only asked by the UNECE to provide information on any changes that had taken place[5]. Non-EU countries were sent a questionnaire (covering, definitions of a household, of an agricultural households, net disposable income, equivalence scale used, valuation of own consumption etc.). Replies were received from 20 EU countries and 25 Non-EU countries (listed within Section XIII.2.1 below).

In March 2005 the UNECE sent out exactly the same survey questionnaire to a group of developing countries. It is recognised that such countries face problems of a conceptual and practical nature that are different from those of OECD members, requiring a separate treatment in this part of the Handbook that deals with what happens in practice. Developing countries were selected mainly on the basis of two criteria: first, the country should have conducted at least one Living Standards Measurement Study (LSMS) household survey and/or conducted a census of agriculture within the FAO's decennial World Census of Agriculture Programmes (WCAP) (See Box XIII.1); and,

[5]An inventories of Income of the Agricultural Households Sector (IAHS) statistics covering EU Member States was first undertaken in 1990 (Eurostat working paper F/LG/187) and a second (in two stages) in 1996 (F/LG/320, 324, 350 and 366). The consolidated inventory, covering all the main elements of the methodology, was published as part of the IAHS 2001 Report (Eurostat, 2002).

second, the government in question should have a data access policy, which preferably requires no prior permission from the respective government to use the data.[6] Whereas the first criteria was based on purely methodologically grounds, the second criteria was rooted in the realization that a lot of the information needed had to be extracted from online internet sources, due to the low response rate amongst the survey recipients. The ten countries that formed the basis of this analysis are Brazil, China, Ghana, India, Jamaica, Morocco, Peru, South Africa, Vietnam, and Zambia (see Annexes C and D at the end of this chapter).

Focus on the World Census of Agriculture Programme (WCAP)

Results are reported here for the two groups of countries (OECD/UNECE and developing) separately, though using the same list of headings that relate to key aspects of measuring the incomes of agricultural households. The links below provide further details of the areas covered in the questionnaire; where this information did not require elaboration, a few sentences are provided here.

XIII.2.1 PREDOMINATELY DEVELOPED COUNTRIES (UNECE AND OECD COUNTRIES)[7]

Responses are grouped according to the main features of the methodology as set out in this Handbook, which also coincided with that used by Eurostat in its IAHS statistics. These are the definition of a household, what distinguishes and agricultural household from other socio-professional (occupation) groups, and the treatment of elements that contribute to the definition of net disposable income of the household. Attention is given to issues such as the use of equivalence scales (to enable households of different sizes and compositions to be placed on a common base for calculating income indicators) and the treatment of imputed items (such as housing and consumption of own produced food). For conveniences countries are grouped according to whether they are EU Member States or not.

XIII.2.2 DEFINITION OF HOUSEHOLD

The survey asked for information on the definition of rural households. This was done primarily to complement statistics on rural areas covered in Part One of this Handbook.

Focus on the Definition of Household: EU Countries

[6]Many countries have alternative sources for some of the information they need on persons working in or dependent on agriculture (for instance, population census or sample survey evidence) and therefore may be inclined to collect only selected data instead of conducting a full agricultural census.

[7]The following EU countries replied: Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Slovakia, Slovenia, Sweden, United Kingdom
Replies were also received from the following countries that were member states of the UNECE and/or OECD but not of the EU: Albania, Andorra, Armenia, Australia, Azerbaijan, Belarus, Bulgaria, Canada, Croatia, Georgia, Japan, Kazakhstan, Kyrgyzstan, Mexico, New Zealand, Norway, Republic of Korea, Republic of Moldova, Romania, Switzerland, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, United States of America.

Focus on the Definition of Household: Non-EU Countries

XIII.2.3 DEFINITION OF AGRICULTURAL HOUSEHOLD

The responses to questions on the definition of an agricultural household are separated into those in EU countries and elsewhere. For consideration of the concept of an agricultural household, refer back to Chapter IX of this Handbook.

Focus on the Definition of Agricultural Household: EU Countries

Focus on the Definition of Agricultural Household: Non-EU Countries

XIII.2.4 TREATMENT OF COMMUNAL UNITS

EU Countries

Chapter IX of this Handbook pointed out that the households sector, as defined for national accounts purposes includes some communal units that are not private households. All the EU countries that provided information on this point followed the instructions of the TIAH/IAHS Manual (Eurostat, 1995) and excluded religious houses, farming cooperatives and similar organisations from the agricultural households sector when generating statistics.

Non-EU Countries

With the exception of Belarus, the thirteen countries that provided information on this point declared that they did not include communal organisationals in the agricultural households sector.

XIII.2.5 CLASSIFICATION INTO SOCIO-ECONOMIC GROUPS (FOR THE PURPOSE OF COMPARING THE INCOME SITUATION OF AGRICULTURAL HOUSEHOLDS)

EU Countries

As has already been pointed out in Chapter IX, Eurostat's methodology for its TIAH/IAHS statistics (Eurostat, 1995) made it clear that it was concerned with enabling comparisons to be made between socio-professional groups (of which agricultural households would constitute one group) drawn up in a consistent manner (that is, a household can only fall into one group, and every household has a group). In paragraph 2.7.3 of the TIAH/IAHS Manual (Rev.1,) it states that: "The basis for classifying households into socio-professional groups within the TIAH is the main source of income of the household's reference person". The UNECE survey of 2004 found that most EU countries had a classification that was close to this target definition. In the Netherlands and Poland the income of the whole household was considered. In France and Italy the classification was based on what the reference person declared to be his/her main activity, taking different factors into account. In Finland and Sweden, reference was made to the main activity of the reference person without any details of how to

determine what the main activity was. Luxembourg and Belgium based their classification on both income and time spent by the reference person.

Non-EU Countries

Six countries explicitly stated that they did not use socio-professional classification of households. A further nine countries did not provide any information on socio-professional classifications. Of the remaining, Andorra and Croatia used the main source of income of the reference person/head of household to classify households into socio-professional groups. Belarus and the United States also used income in the classification but from the information provided it is not evident if it was the income of the household or of the reference person. In the Republic of Korea the main source of income of all household members was used.

XIII.2.6 SHORT-TERM STABILITY MECHANISM

Four EU countries made use of smoothing to improve the stability of the number of households deemed to be agricultural (again, see Chapter IX on the significance of this issue). None of the non-EU countries make use of short-term stability mechanisms.

XIII.2.7 EQUIVALENCE SCALES

Ways of reducing households of different sizes and compositions to a common unit (such as income per Consumer Unit) were described in Chapter IX. The coefficients by which this is achieved are known as an equivalence scale.

Focus on Equivalence Scales in EU Countries

Focus on Equivalence Scales in Non-EU Countries

XIII.2.8 OWN CONSUMPTION

EU Countries

Own consumption is of particular importance to the incomes of agricultural households and is to be included in their measurement (see Chapter X). The TIAH Manual (3.4.2) (Eurostat, 1995) stated that own consumption should be valued "at the basic price of similar goods sold on the market". The 2004 UNECE survey found that almost all of the EU countries estimated own consumption; the only exception was Finland that stopped producing such estimates in 2000. In Estonia and Lithuania the value was a self-reported estimation by survey respondents at markets prices. Most of the countries declared that own consumption was valued at market price without specifying exactly what kind of price was used. Germany, Greece and Ireland made use of the producer/farm gate price, while in Spain the retail price was used.

Non-EU Countries

Canada and Kyrgyzstan did not provide any estimation of own consumption value. The United States and Norway used self-reported estimations made by survey respondents. With the exception of Japan, that used farm gate prices, the value of own consumption was obtained by using market price.

XIII.2.9 IMPUTED RENT

EU Countries

Chapter X of this Handbook showed that imputed rental value of owned dwelling usually comprises part of household income. Out of the 19 countries that replied to this question in the UNECE survey, four countries did not calculate an imputed rental value of dwellings. Of the remaining 15 countries, the imputed rental value of owned dwellings was usually measured on the basis of the value of actual rents of similar dwellings. In Estonia, Greece, Lithuania and Slovenia the value was a self-reported estimation by survey respondents.

Non-EU Countries

Six countries, out of the seventeen that replied to this question, did not impute the rental value of owned dwellings.

The US Department of Agriculture measures the rental value of operator dwelling by using direct reported values of the operator dwelling and rent-to-value ratios obtained from the US Department of Commerce. The product of these two items gives a measure of gross space rent. Survey respondents report expenses on their dwellings except for depreciation, which is imputed. Gross rents and expenses are used to calculate an estimate of net rent for operator. In Japan, the imputed rent is valued on the basis of the purchase value of "own dwellings" less depreciation. In Norway, the value is included in the tax return data, though the stipulated taxation value of "own dwellings" is much lower than the real market value.

XIII.2.10 CALCULATION OF NET DISPOSABLE INCOME OF AGRICULTURE HOUSEHOLDS – ITEMS COVERED

Countries were asked to indicate from a list of items, based on the Eurostat IAHS Manual's definition of disposable income (see Chapter X of this Handbook), which elements were included in their national statistics on agricultural household income. Because of the large number of individual items and differences between countries in what they cover, it is not proposed to make a detailed report here. Reference should be made to the link posted at the end of this section. Though not identical with the definition recommended by this Handbook, the two are close on the major items.

Nevertheless, a general observation can be made about one aspect of the definition of income – the use of "adjustment". As was described in Chapter X, disposable income can be interpreted as measuring the maximum value of the final consumption of goods and services (used to satisfy the needs and wants of its members) that a household can afford to consume in the current period without having to reduce its cash, dispose of other assets or increase its liabilities. However, the consumption possibilities of a household are also affected by the value of consumption goods and services received from the government as social transfers in kind. When these latter items are taken into consideration, the result is referred to as the "adjusted" disposable income.

EU Countries

Nearly all EU countries responded that they calculate, or have calculated in the past, net disposable income of agricultural households, though the regularity and up-to-dateness of published statistics varies widely. Those with no published estimates available at the time of the UNECE survey were Hungary, Latvia, Slovakia, Slovenia and the United Kingdom. Most published results do not take social benefits in kind into account; only three countries (Lithuania, Spain and Estonia) had calculated the "adjusted" disposable income.

Non-EU Countries

Only nine non-EU countries reported that they calculated net disposable income of agricultural households. Japan, Mexico and Republic of Moldavia calculated the "adjusted" disposable income by allowing for social transfers in kind. Australia reported that it deducts *imputed* social transfers in kind. In addition, Albania reported that implied data are covered elsewhere.

Focus on the Definition of Net Disposable Income for Agricultural Households. Other OECD/UNECE Countries (non-EU25 Member States)

Focus on the Definition of Net Disposable Income for Agricultural Households, EU-25 Member States

XIII.2.11 CONCLUSIONS

The results of the survey on agricultural household income statistics undertaken by UNECE in 2004 and 2005 show that, among OECD and UNECE countries, there were many differences in the concepts, definitions and coverage used in defining the income of agricultural households. It might be argued that such flexibility of detail is needed in order to reflect differing socio-economic conditions. However, these differences make cross-country comparisons difficult. This Handbook may be able to improve this situation by pointing to good practice in terms of definitions and their use. Readers are directed towards the recommended definitions of an agricultural household contained in Chapter IX and of income given in Chapter X.

XIII.2.12 SELECTED DEVELOPING COUNTRIES

As noted above, the UNECE 2005 survey also covered selected developing countries. It is recognised that, especially in developed countries, farm operators are only one component in the makeup of rural communities. The information provided was sketchy. For some countries, more information is available from the separate UNECE survey on rural development statistics (see Chapter III of this Handbook).

XIII.2.13 FOCUS ON THE DEFINITION OF HOUSEHOLD IN SELECTED DEVELOPING COUNTRIES

XIII.2.14 FOCUS ON THE DEFINITION OF AGRICULTURAL HOUSEHOLD IN SELECTED DEVELOPING COUNTRIES

XIII.2.15 FOCUS ON THE CLASSIFICATION INTO SOCIO-ECONOMIC GROUPS IN DEVELOPING COUNTRIES

XIII.2.16 SHORT-TERM STABILITY MECHANISM

None of the surveyed developing countries make use of short-term stability mechanisms.

XIII.2.17 FOCUS ON EQUIVALENCE SCALES IN DEVELOPING COUNTRIES

XIII.2.18 FOCUS ON OWN CONSUMPTION IN DEVELOPING COUNTRIES

XIII.2.19 FOCUS ON IMPUTED RENT IN DEVELOPING COUNTRIES

XIII.2.20 FOCUS ON THE CALCULATION OF NET DISPOSABLE INCOME OF AGRICULTURE HOUSEHOLDS IN DEVELOPING COUNTRIES

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Focus on the European Community Household Panel (ECHP) and Community Statistics on Income and Living Conditions (EU–SILC), Now Renamed Income, Social Inclusion and Living Conditions (EU-SILC)

The *European Community Household Panel (ECHP)* was initiated in 1993 with the intention of establishing a European database of comparable statistical information for all Member States (EUR 12) on the income and living conditions of households. Details were collected on the incomes of individual household members, which then could be aggregated to the household level in various ways (for example, by using a *dwelling* or a *single budget* concept of the household). The first main survey took place in 1994, with a sample of some 60,500 cases. It was anticipated that about 3,300 would turn out to be agricultural households; in the United Kingdom the sample of 5,000 households was expected to yield about 100 farm households. In reality, the first round of the ECHP threw up fewer than 2,661 cases in which the head of household (or the reference person) was returned as self-employed and had agriculture as their broad industry group. In Germany there were 25 households with such a reference person and in United Kingdom 61 households; only in Greece, Ireland and Portugal were there more than 300 such households. The number of cases corresponded to less than 1% of agricultural households estimated in Eurostat's sector-level Income of the Agricultural Households Sector (IAHS) statistics, and less than 0.5% in countries other than Ireland and Luxembourg. Over time the numbers were expected to become even smaller. By way of contrast, the EU's Farm Structure Survey aims for a minimum sample of 10% in order to catch the diversity found in this industry, although in practice this sometimes falls to 3%. In addition to the number of agricultural cases in the ECHP sample being too small to be usable, it suffered from the same well-known problems as household budget surveys in its attempts to gather reliable income data from self-employed people, especially those in agriculture.

The ECHP was replaced by the Community Statistics on Income and Living Conditions (EU-SILC) survey which had a planned cross-sectional sample size of 121,000 households for EU-25 (91,000 for the longitudinal study). The EU-SILC was launched under a gentleman's agreement with six EU-15 countries plus Norway in 2003 and re-launched under a Regulation with twelve EU-15 countries (Belgium, Denmark, Greece, Spain, France, Ireland, Italy, Luxembourg, Austria, Portugal, Finland and Sweden) and in Estonia, Norway and Iceland in 2004. In 2005 the rest of the EU-25 countries joined the EU-SILC. Bulgaria, Romania, Turkey and Switzerland launched SILC in 2006.

However, the numbers of agricultural households are not numerous. Preliminary analysis within Eurostat suggested the following numbers of farmer households were in the 2004 EU-SILC database[1] (Austria 150; Belgium 40; Denmark 109; Estonia 103; Spain 253; Finland 1,000; France 202; Greece 639; Ireland 13; Italy 367; Luxembourg 78; Portugal 367, Sweden 31). As a rule of thumb EU-SILC has suggested that at least 2,000 cases are needed for reliable analysis of income distributions; coverage in no Member State approached such numbers. With 200 agricultural household cases it might be

[1]It should be noted that information supplied by Eurostat and that supplied by Member States sometimes differ marginally

possible to make a general qualitative comparison between the agricultural sector and other sectors, but it would not be possible to go beyond this. Even these broad comparisons are beyond the capacity of the sample in most of the Member States listed.

EU-SILC also encounters some of the generic problems of collecting income data from self-employed households. In France, a comparison with alternative data sources suggests that there is under-reporting in the French SILC of about 20% of this type of income.

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Focus on data Sources for Statistics on Agricultural Household Incomes in 27 EU Countries[1]

Following a 1985 Green Paper on the CAP (Commission 1985) that called for a better picture of the overall incomes of farmers, Eurostat developed a methodology based in national accounting for estimating the disposable income of the complete (sub)sector of agricultural households in EU Member States (Income of the Agricultural Household Sector – IAHS – statistics). Results from this project were published from 1992. However, the Eurostat project failed to make progress beyond the mid-1990s. Only about half of the EU-15 Member States used the intended macroeconomic methodology, and its key proponents (Germany, whose results went back to the early 1970s, and France) encountered increasing difficulty in applying it annually so that the latest available results became increasingly historical.

A review by the European Court of Auditors (ECA, 2003) on the ways in which incomes in agriculture were monitored within the EU concluded that Eurostat did not have a satisfactory means by which the CAP's aim of achieving a fair standard of living of the agricultural community could be assessed. Income statistics for household-firm units was needed for this purpose. Recognising the deficiencies of Eurostat's previous IAHS statistics, the Court recommended (later endorsed by the Council (of Ministers)) that a feasibility study should be undertaken of using a uniform approach across the EU as a way of improving the quality of the statistics. In essence, this meant testing the practicality of drawing on existing microeconomic data sources or developing new ones to generate results. This study was undertaken by AgraCEAS Consulting (Agra CEAS, 2007). Previous information-gathering work by Eurostat (reported in 2002), OECD (1995), ISTAT (2002) and Statistics Sweden (2006) was drawn upon where relevant.

In early 2007 AgraCEAS conducted a survey of statistical authorities in all EU27 countries and missions (with face-to-face interviews) to ten. Only two countries did not reply or cooperate (Belgium and Cyprus). The first task was to update **the inventory of data sources** that had been built up from previous work at Eurostat and OECD (1995, 1997), and which was already represented in the UNECE Handbook (2005/2007). Four main types of data source are identified:

- **Farm accounts surveys** that in some countries collect data on household income, which is in addition to the requirements of the FADN/RICA system that is only concerned with the agricultural holding. The threshold tends to be high relative to the size spectrum encountered in the national Farm Structure Survey, and coverage of household members other that the farmer and spouse may be poor (though this is not a major problem if the concept of the single-budget household is employed, from which other financially independent adults living in the farm dwelling are excluded). Data quality is generally good, though information on off-farm income is less satisfactory than are variables related to the farming activity.
- **The EU-SILC system** (Statistics on Incomes and Living Conditions), applied in all Member States, that conducts annual surveys of a general panel of households.

[1]Based on AgraCEAS 2007

Income and occupation details are collected for each individual in the household. Though both the household unit and income concept can be made compatible with the IAHS template, in most Member States the number of cases where farming is the main source of income is too small for meaningful results to be estimated. There are also issues on data quality in income from self-employment.

- **Household budget surveys,** though again the numbers of agricultural cases where farming is the main source of income are too small in these general surveys, the quality of the data on self-employment may not be high, and data relate to the household unit (which is the dwelling rather than the single budget unit) and generally not to individuals within it.
- **Taxation records and income statistics registers based on them.** Though potentially covering all households, or samples of them, these are only developed as a data source for income studies (as opposed to taxation issues) in a few Member States. In others there may be legal barriers to their use as a basis for statistics. A major drawback is that, in many countries, all or some farmers are not taxed according to their accounted income but on some per hectare (or similar) standard basis. This means that actual income is not recorded. There may also be tax conventions (such as treating certain forms of government payment as tax-free) that undermine the quality of the income data as reflecting the household's spending power.

The present situation is shown in the following Focus Table XIII.1.

FOCUS TABLE XIII.1
Inventory of existing microeconomic data sources by Member State

MEMBER STATE	FARM ACCOUNTS SURVEY	EU-SILC*	FAMILY (HOUSEHOLD) BUDGET SURVEYS	TAXATION RECORDS	OTHER
Belgique/ Belgie/Belgium	Statistics Sweden (2006) suggests that income from outside the holding is collected, but this could not be verified in this study.	There were only 40 cases in 2004.	A survey exists, but there are few agricultural cases.	Records exist, but income is not on an account basis.	
Bulgaria			A survey exists, but agricultural cases are not identified separately	Not applicable	Special annual survey of holdings and livestock. Sample about 1000
Ceska republika/ Czech Republic		There were only 64 cases of people working in agriculture, and only 18 self-employed farmers	*No income data collected*	Incomes not actual -revenue is declared, but costs can be estimated as a proportion of this.	
Danmark/ Denmark	Formerly there were accounts surveys of the Farmers' Association (sample of 16,000); Smallholders' Association (sample of 4,600); and the Institute of Agricultural Economics (sample of 1,800). There is now only one farmer association and total number of accounts is somewhat lower, but still large. There are approximately 2,100 accounts in FADN, of which around 300 relate to horticultural holdings	There were only 109 agricultural cases in 2004.	There is a survey, but there are few agricultural cases.	The Income Statistics Register System is tax-based and is combined with an agricultural statistics register. There are 15,000 cases.	
Deutschland/ Germany	There are test holdings of 11,000 which also cover household income.		There is a survey of incomes and expenditure at 5-yearly intervals.	This takes place on a 3-yearly basis. However, about half of farmers are not taxed on an accounting income basis, standards are used as an approximation.	There is an annual population microcensus .
Eesti/Estonia		There were only 103 agricultural cases in 2004.	Number of agricultural cases not indicated (likely to be small, and self-employed income on a household basis only)	*No information*	

MEMBER STATE	FARM ACCOUNTS SURVEY	EU-SILC*	FAMILY (HOUSEHOLD) BUDGET SURVEYS	TAXATION RECORDS	OTHER
Ellada/Greece	Household income is not normally covered, but a pilot survey was made in 1992.	There were 642 agricultural cases in 2004.	This has been carried out every five years, but will be annual from 2006 there have been difficulties with incomes from self-employment in the past.	Taxation records only cover professional farmers (defined as having more than 50% of time self-employed in farming) who earn over €3,000 from self-employment in agriculture or receive at least €1,500 in subsidy from crop enterprises or €2,250 from livestock enterprises.	
Espana/Spain		There were only 253 agricultural cases in 2004 (similar number in 2005).	There are only about 120 agricultural cases, but there are difficulties with incomes from self-employment.	Some farmers do not pay tax based on actual incomes, and incomes may be estimated.	
France	No information on non-farm income collected in FADN/RICA. But there is periodic matching and merging at the case level of RICA results with tax data (for other incomes). The latest of these exercises were carried out for 1997 and 2003.	There were only 202 agricultural cases in 2004.	Only about 200 farmer households are covered in the BDF.	For more than 50% of farmers incomes from agriculture are not taxed on an accounts basis but under a "forfait" system (estimated income based on farm type and Department). Information on other sources of income considered reliable.. There have been two levels of sample enquiry (general and agricultural), A special study was undertaken in 1990.	There was a special farm survey (CERC) in 1978.
Ireland	This is linked periodically with the Household Budget Survey.	There were only 13 agricultural cases in 2004 and there are different definitions for farm household.	Some 1,000 farmer-households were included in the 1987 survey. The income data was good and this exercise was repeated in 1994 and 1999/2000.	Farmers are not well represented under this source.	There are records of social assistance.

MEMBER STATE	FARM ACCOUNTS SURVEY	EU-SILC*	FAMILY (HOUSEHOLD) BUDGET SURVEYS	TAXATION RECORDS	OTHER
Italia/Italy	Questions on off-farm income have been included in RICA-REA from 1998 (the number of valid cases was 11,379 in 2000).	There were 367 agricultural cases in 2004.	This is continuous and there are many agricultural cases, however, income data are not of high quality.	Income is not on an accounts basis. The valuation is based on farm type and region.	Bank of Italy survey of households. The ISMEA 1996 Survey on agricultural households covered 1881 farms. This has not been repeated since.
Kypros/Kibris/ Cyprus	Statistics Sweden (2006) suggests that income from outside the holding is collected, but this could not be verified in this study.				
Latvija/Latvia		Some 1,500 of the 3,843 cases in rural areas have 1 ha or more of agricultural land (mostly subsistence producers). Another 1,386 cases in rural areas have agricultural land (perhaps for recreational purposes).	Currently an annual survey. Of the net effective sample, 1,900 households have agricultural land, of which 150 produce for the market. Income is measured gross (not net).	Tax data for non-agricultural income might be used, if combined with FADN/RICA *(the implication is that tax data on income from farming is not usable in a direct way)*.	From 1999-2003 data was collected an income and expenditure as part of the crop and livestock survey. Sample was about 15,000 holdings
Lietuva/ Lithuania	There are 1,286 FADN/RICA cases.	In the 2004 EU-SILC there were 1,650 rural households (16% of total) but agricultural households were not separately identified	In the 2004 HBS there were 509 agricultural households (7,586 in total)		
Luxembourg	Special questions covering household income were added in 1989 only.	There were only 78 agricultural cases in 2004 (from a total of 3,500).	There are few agricultural cases.	Most farmer's income is not on an accounts basis.	There is a poverty survey of households (CEPS).
Magyaroxzag/ Hungary	Currently does not cover non-farm income, but this might be technically possible	Very small number of cases likely (not analysed).	Regular annual survey – number of agricultural cases not given, but a special pilot survey carried out (see 'other). HBS changed in 2004-05 to better reflect agriculture	Special tax arrangements for registered agricultural producers, including exemption on small levels of production, mean that tax records are not suitable as a data source on incomes.	Special pilot survey (2003) of agricultural households based in HBS but drawn from the agricultural census. 6000 cases

MEMBER STATE	FARM ACCOUNTS SURVEY	EU-SILC*	FAMILY (HOUSEHOLD) BUDGET SURVEYS	TAXATION RECORDS	OTHER
Malta		Data collection started in 2005 for the reference year 2004. This data is collected on an annual basis according to EU Regulation. Only 60 households from 3,200 (2.5%) are agricultural. Small proportions from relatively small samples may give misleading results.	The most recent HBS took place in 2000 (next planned for 2008). Approximately 2,500 households were included, but no information given on the number of agricultural cases.	The NSO has not been granted access to income tax data on either the micro or macro level.	
Nederland/ Netherlands	There used to be two annual surveys; one used to build the national production account (with 3,000 cases); the other was part of FADN/RICA (with 1,500 cases). These are now combined. There are currently 1,500 cases.	There are 6,500 cases in total. The number of agricultural cases is unknown.	Total sample size is 2,000, but the number of agricultural cases us unknown.	There is an annual panel study, the Personal Income Distribution Statistics. Access to further tax registers has recently been gained and the use of these in relation to agriculture is currently being studied.	
Osterreich/ Austria	There is a sample of 2,500 holdings which also covers household income. 1,800-1,900 contribute to FADN.	There were 271 cases in 2005.	This is carried out once every 5 years.	For a large proportion of farmers tax payment is not based on accounting income (farmers pay 'lump sum' taxes).	
Polska/ Poland	Data on five types of non-agricultural income collected from about 10,000 farmers in 2005. Results published annually.	Number of agricultural cases not known; they are combined with other self-employed.	Some 2,000 agricultural households in 2005., but problems with income data quality (collected over a month).	Only the production of a specific list of commodities is covered by the tax system. Assessment (mainly) uses a standard rate based on land and forest area, land quality and distance to market.	
Portugal		There were 367 cases in 2004.	There are difficulties with income from self-employment and this was last undertaken in 2000.	Few farms are covered.	
Romania		SILC will begin in 2007.	Results are available for 2001 to 2006. The number of cases and quality of the income data is unclear.		
Slovenija/ Slovenia		1,311 cases have income from farming (2005 – 16% of all cases).	300 cases (of a total of 1,300)	Only a minority are taxed on an accounts basis. Most are on a cadastral income assessment.	

MEMBER STATE	FARM ACCOUNTS SURVEY	EU-SILC*	FAMILY (HOUSEHOLD) BUDGET SURVEYS	TAXATION RECORDS	OTHER
Slovensko/ Slovakia		Not separately identified	Not separately identified		
Suomi/Finland	The Profitability Study of Agriculture (FADN/RICA Finland) covers 1,000 holdings. In principal the entire household is covered. However, Statistics Sweden (2006) notes that data collection on income from outside the holding was discontinued after 1997.	There are around 800 agricultural cases (cross-sectional EU-SILC is fully integrated with the national Income Distribution Survey).	There is a family budget survey, but the sample has been reduced since 1994.	There are three data sources: (a) Agricultural Enterprise and Income Statistics (10,500 agricultural cases in 1999) with data taken from tax forms; (b) Income and Taxation Statistics for the Finnish Farm Economy (formed by combining administrative registers); and, (c) Income Distribution Statistics (totally register-based) covering all private household-dwelling units	

MEMBER STATE	FARM ACCOUNTS SURVEY	EU-SILC*	FAMILY (HOUSEHOLD) BUDGET SURVEYS	TAXATION RECORDS	OTHER
Sverige/Sweden	The Farm Economics Survey (JEU) covers 1,000 holdings, but questions about non-farm incomes were dropped in 1990.	There were only 31 agricultural cases in 2004 and less than 10 in 205.	(a) Survey of household finances (HEK) Sample of 17.000 (b) Survey of living conditions (ULF) sample of 9000 The number of agricultural households is not known but is considered to be too small to give reliable results.	There are three data sources: (a) Taxation Statistics of Agriculture (DU), historic series ended in 1993 (2,700 agricultural cases in 1991); (b) Survey of Income Distribution (HINK), taxed based, covering all households, about 600 agricultural cases in 1992, 199 in 1997; and, (c) Annual taxation statistics for the whole population, farmers were separately identified in 1991, 1992, 1996 and 1997.	
United Kingdom	The non-farm income of farmer and spouse has been covered since 1988/89. Full household income data (for the principal farmer only) was collected from 2004/05, but will be published only from 2005/06. Data from the first year of collection were not regarded as being of sufficiently high quality to publish.	The UK contribution to EU-SILC, the General Household Survey, is not sufficiently developed to be actively under consideration, but it may present options for the future.	This does cover the agricultural sector, but there are few households headed by a farmer (about 60).	Less than 2,000 agricultural cases are taken from the Survey of Personal Incomes (from tax records of self-employment income). Farmers with businesses run as companies not covered.	The Family Resources Survey was introduced in 1996, but there are too few agricultural cases.

Notes:
* 2004 is the latest year for which data are available.

Source: taken from Hill (2000) and updated incorporating basic information from Eurostat and OECD (1995) and a 2007 survey of Member States carried out under the auspices of this project.

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Focus on Data Sources and References for Data of Developing Countries

(Note: links were taken from the 2005 edition of the Handbook and may not be current)

A Sample of LSMS Surveys

COUNTRY	YEAR	HH COUNT	QUESTIONNAIRE		ADDITIONAL METADATA DOCUMENTATION ON THE WEB	ACCESS POLICY
Brazil	1996-1997	4,940	Portuguese pdf	English pdf	Additional information for the 1996-97 Brazil Survey of Living Conditions http://www.worldbank.org/lsms/country/brazil/br96docs.html	Non prior permission from government is required to use the data
China (Heibei Liaoning Province)	1995& 1997	780	Household Chinese Household English Village Chinese Village English		http://www.worldbank.org/lsms/country/china/chndocs.html	Non prior permission from government is required to use the data
Ghana	1987/88 1988/89 1991/92 1998/99	3,200 3,200 4,565 5,998	Household Questionnaire Part A PDF (97 KB) Household Questionnaire Part B PDF (117 KB) Community, PDF - (73 KB) Price, PDF - (89 KB)		Documentation for the 1998/99 Ghana Living Standard Survey	Prior government permission is required, but the track record for a timely, positive response is good
India (Uttar Pradesh and Bihar)	1997-98	2,250	Household Questionnaire, PDF (266 KB) Village Questionnaire, PDF (132KB)		Documentation for the 1997-98 Uttar Pradesh and Bihar Survey of Living Conditions http://www.worldbank.org/lsms/country/india/upbhdocs.html	Non prior permission from government is required to use the data
Jamaica	1988-2000 (Annual)	2,000-7,300	Questionnaires for all years: *Survey of Living Conditions* *Labour Force Survey*		Documentation for the Jamaica Survey of Living Conditions 1988-2001 http://www.worldbank.org/html/prdph/lsms/country/jm/jmdocs.html	Prior government permission is required, but the track record for a timely, positive response is good
Peru	1985 1991 1994	5,120 2,200 3,500	Household questionnaire Community questionnaire		Basic Information Peru: Living Standards Measurement Survey (PLSS) 1991 http://www.worldbank.org/lsms/country/pe91/docs/pe91_e.pdf	Non prior permission from government is required to use the data

South Africa	1993	9,000	Household questionnaire Community questionnaire	Documentation for the South Africa Integrated Household Survey http://www.worldbank.org/lsms/country/za94/za94docs.html	Non prior permission from government is required to use the data
Vietnam	1992/1993 1997/99	4,800 5,994	Household Commune School Price	Documentation for the 1997/98 Viet Nam Living Standards Survey http://www.worldbank.org/lsms/country/vn98/vn98docs.html	Prior government permission is required, but the track record for a timely, positive response is good
Zambia	1991* 1993* 1996 1998 2002	9,886 10,121 (PS II) 11,752 (LCMS I) 16,710 (LCMS II)	Household	The 1996 Zambia Living Conditions and Monitoring Survey (LCMS) http://www4.worldbank.org/afr/poverty/measuring/Indicators/ZMB_96.PDF	Contact ZAMSIF

Notes:

* Priority survey I (1991) and Priority Survey II (1993), which subsequently were replaced by LCMSI-III. During 1985-99 the following countries implemented full-size LSMS surveys: Algeria, Brazil, Côte d'Ivoire, Ecuador, Ghana, the Kyrgyz Republic, Mauritania, Morocco, Nepal, Pakistan, Panama, Peru (1985-86, 1991, and 1994), Turkmenistan, and Vietnam.

Scaled-down LSMS Surveys have been carried out, with World Bank support in Albania, Azerbaijan, Bolivia, Bulgaria, Pakistan (1995/96 and 1996/97), Peru (1990), and Tanzania (Grosh and Glewwe, 2000b).

A Sample of Developing Countries conducting Agriculture Censuses

COUNTRIES	ON WEB	1980 ROUND	1990 ROUND	2000 ROUND
Brazil	Yes	1980/1985		1996
China	Yes			1997
Ghana				
India	No	1976-1977 / 1980-1981	1985-1986 1990-1991	1995-1996 2000-2001
Jamaica	No	1978-1979		
Peru	Yes		1994	
South Africa	Yes		1993	2002
Vietnam	No		1994	2001
Zambia	Yes		1990	(2000)

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Focus on the World Census of Agriculture Programme (WCAP)

Since 1950 the FAO has been assisting countries in planning and conducting censuses of agriculture. The agricultural census is of particular importance to countries in which significant segments of the population depend on agriculture for their livelihood. From a strictly statistical viewpoint, the census data represent one of the most important components of the information system in a country and can serve as the basis for many other statistical activities related to food and agriculture, such as conducting various agricultural sample surveys.

Each decennial WCAP, promoted first by the International Institute of Agriculture and then prepared by the FAO, has provided methodological guidelines for organizing national agricultural censuses. The six decennial Programmes - centred on 1950, 1960, 1970, 1980, 1990 and 2000 - gradually expanded the census scope while keeping structural aspects of the agricultural production sector as the central theme (Stloukal, 1999). Today, there are more than 100 countries participating in the WCAP at set periods.

The publication "**Programme for the World Census of Agriculture 2000, (Vol. 5)**", is intended to assist countries by providing definitions, concepts, standards and guidelines for censuses in the decade 1996-2005. The FAO's Statistics Division is currently developing the Programme for the 2010 round of agricultural censuses, covering the period from 2005 to 2014. The programme is expected to be finalized in 2005 (http://www.fao.org/economic/ess/world-census-of-agriculture/en/).

Each WCAP has attempted, in one way or another, to cover some of the basic demographic and economic characteristics of persons belonging to the population of the holders' households. The FAO recommendations have typically been decided on the basis of extensive consultations with statistical offices in individual countries. Their evolution thus mirrors the collective experience of national and international organizations with regard to the collection of agricultural information.

Recognizing that countries differ in their capacity to carry out a census of agriculture, FAO WCAPs have always included a recommendation that countries should tailor the agricultural census to their unique situation. Countries with poor statistical systems have been advised to restrict the scope to essential items, whereas statistically more developed countries have been invited to broaden their census objectives. Ultimately, however, it is up to the national authorities to choose the statistical topics to be monitored, and the classifications to be used, in the agricultural census in their country (Stloukal, 1999).

Focus on the definition of Household: EU Countries

The way the household is defined is important because it influences the survey's coverage of the population and the analysis of the data, in particular when cross-country comparisons are made (see Chapter IX in this Handbook). According to the survey responses, the most commonly used criteria in the definition of a household are co-residence (living together in the same dwelling unit), a pooling of income and resources, the sharing of expenditures (including joint provision of the essentials of living such as food) and, finally, the existence of family or emotional ties.

Focus Table XIII.2 shows that 11 out of the 22 EU countries for which data are available used the target definition of a household as specified in paragraphs 2.1 to 2.5 of the revised Manual that Eurostat published, after discussion with Member States, for its Total Income of Agricultural Households (TIAH) statistics (Eurostat, 1995). These statistics subsequently were renamed the Income of the Agricultural Households Sector (IAHS) statistics, and the two acronyms are used interchangeably in this Handbook. Eurostat's TIAH/IAHS target household definition was based on that of the European System of Accounts (ESA)(itself being rooted in the UN System of National Accounts - SNA). This definition refers to people living in the same accommodation, with a shared budget and who consume certain types of goods and services such as food collectively. People do not have to have a family link. Four other countries (Estonia, Latvia, Slovenia and Sweden) provided a definition very close to the one stated in the ESA.

The UNECE 2004 survey of what definitions were in use found (see Core Text of Chapter XIII) found that in practice they deviated to different degrees from the TIAH/IAHS target definition, the UK's definition being the most dissimilar. This stems from the fact that the UK's statistics are based on tax records of individuals. Finally, it should be pointed out that the family link criterion is used only in Austria, Belgium and Denmark.

FOCUS TABLE XIII.2
Definition of household in EU countries

	REFERENCE TO				
COUNTRY	COMMON DWELLING	SHARED BUDGET	SHARED FOOD/MEALS	FAMILY LINK NECESSARY	STUDENTS/ TEMPORARILY ABSENT
Austria	Yes	No	Yes	Yes	Not mentioned
Belgium	(Yes)	No	No	Yes	Not mentioned
Bulgaria	Yes	Yes	Yes	No	Included
Denmark	Yes	No	No	Yes	Not mentioned
Estonia	Yes	Yes	Yes	No	Not mentioned
Finland	Yes	Yes	Yes	No	Not mentioned
France	Yes	Yes	Yes	No	Not mentioned
Germany	Yes	Yes	Yes	No	Not mentioned
Greece	Yes	Yes	Yes	No	Not mentioned
Hungary	Yes	Yes	Yes	No	Not mentioned
Ireland	Yes	Yes	Yes	No	Not mentioned
Italy	Yes	Yes	Yes	No	Not mentioned
Latvia	Yes	Yes	No	No	Not mentioned
Lithuania	Yes	Yes	Yes	No	Not mentioned
Luxembourg	Yes	Yes	Yes	No	Not mentioned
Netherlands	Yes	Yes	Yes	No	Not mentioned
Poland	Yes, but seamen and workers abroad included	Yes	Yes	No	No
Portugal	Yes	Yes	Yes	No	Not mentioned
Romania	Yes	Yes	No	No, but definition is "generally relatives"	Not mentioned
Slovakia	N/A	N/A	N/A	N/A	N/A
Slovenia	Yes	Yes	Yes	No	Not mentioned
Spain	Yes	Yes	Yes	No	Not mentioned
Sweden	Yes	No	No	No	Not mentioned
United Kingdom	Not applicable since based on tax returns of individuals				

Source: UNECE (2005), *Survey on Agricultural Household Income Statistics*.

FOCUS PIECES

Eurostat (1995). *Manual of the Total Income of Agricultural Households (Rev.1)*. Theme 5 Series E. ISBN 92-827-5227-5. Eurostat, Luxembourg. Also published as part of Eurostat (2002). *Income of the Agricultural Households Sector, 2001 Report*. Eurostat, Luxembourg.

Focus on the Definition of Household: Non-EU Countries

Out of the 25 Non-EU countries that replied to the UNECE survey questionnaire, 18 provided a definition of household (see Focus Table XIII.3). All the countries use the co-residence criterion with the only exception being Andorra. In addition, Andorra is the only country to require members of the household to be part of the same family.

The definitions used in Canada, Norway and the United States do not refer to shared budgets but only refer to sharing a dwelling unit. The wording of the definition of household provided by the Republic of Korea does not refer to sharing a dwelling unit but it seems to be implied. Reference to shared meals and/or common provision of food can be found in the definition of household in 10 countries.

FOCUS TABLE XIII.3
Definition of household in non-EU countries

	REFERENCE TO				
COUNTRY	COMMON DWELLING	SHARED BUDGET	SHARED FOOD / MEALS	FAMILY LINK NECESSARY	STUDENTS / TEMPORARILY ABSENT
Albania	N/A	N/A	N/A	N/A	N/A
Andorra	No	Yes	Yes	Yes	Not mentioned
Armenia	Yes	Yes	No	No	Not mentioned
Australia	N/A	N/A	N/A	N/A	N/A
Azerbaijan	Yes	Yes	Yes	No	Not mentioned
Belarus	Yes	Yes	No	No	Not mentioned
Canada	Yes	No	No	No	Included
Croatia	Yes	Yes	Yes	No	Not mentioned
Georgia	Yes	Yes	No	No	Not mentioned
Japan	N/A	N/A	N/A	N/A	N/A
Kazakhstan	Yes	Yes	Yes	No	Not mentioned
Kyrgyzstan	Yes	Yes	No	No	Not mentioned
Mexico	Yes	No	Yes	No	Not mentioned
New Zealand	Yes	Yes	Yes	No	Not mentioned
Norway	Yes	No	No	No	Not mentioned
Republic of Korea	N/A	Yes	Yes	No	Not mentioned
Republic of Moldova	Yes	Yes	No	No	Not mentioned
Switzerland	Yes	Yes	Yes	No	Not mentioned
The Former Yugoslav Rep. of Macedonia	Yes	Yes	Yes	(i)	(ii)
Turkey	N/A	N/A	N/A	N/A	N/A
Turkmenistan	Yes	Yes	No	No	Non mentioned
Ukraine	Yes	Yes	No	No	Non mentioned
United States of America	Yes	No	No	No	Non mentioned

Note:
(i) Not necessary but non-family members need to work, eat and reside in the house community.
(ii) Students always included, other people absent for more than 45 days in the last three months are excluded.

Source: UNECE (2005), *Survey on Agricultural Household Income Statistics.*

Focus on the Definition of Agricultural Household: EU Countries

According to replies received to the UNECE 2004 survey, the two definitions of agricultural household most commonly applied in the EU countries are the "narrow" and the "broad" ones (see Focus Table XIII.4). According to the "narrow" definition "agricultural households are those where the income from independent agricultural activity, net of capital consumption, constitutes the *main source* of the total income of the reference person" This corresponds with the definition set out in Eurostat's Manual for its TIAH/IAHS statistics (Eurostat 2005, paragraph 2.7.3). This approach forms part of a complete disaggregation of households into socio-professional groups, permitting income results to be compared on a consistent basis. In contrast, agricultural households, in the "broad" sense, are those that derive *some income* from independent activity in agriculture (other than income solely in kind). This income can arise from activity of the head of household or any other member" (Eurostat 1995, paragraph 2.10.1). The use of the "broad" definition does not allow comparisons of agricultural household income to be made, except with the "all households" average (or "all other households"). See Chapter IX of this Handbook for a full discussion of the concepts and definitions of agricultural households. There the use of both definitions was proposed to cater for different policy contexts, with additional possibilities (such as being linked with farm size) also considered.

FOCUS TABLE XIII.4
Definition of agricultural household (narrow or broad) and inclusion of fishery/forestry in EU countries

COUNTRIES	NARROW/BROAD	FISHERY/FORESTRY
Austria	Narrower then IAHS target	Included
Belgium	No information on definition used	Not included
Bulgaria	Broad	Not included
Denmark	Narrow	Not included
Estonia	Not in use	Included
Finland	Broad	Not included
France	Not in use	Not included
Germany	Narrow	Not included
Greece	Narrow	Included
Hungary	Narrow	Not included
Ireland	Narrow	Not included
Italy	Narrow	Not included
Latvia	Not in use	N/A
Lithuania	Narrow	Not included
Luxemburg	Not in use	N/A
Netherlands	Narrow	Not included
Poland	Narrow	Not included
Portugal	Not in use	N/A
Romania	A farmer household is a household where the head of household has the occupational status of being self-employed in agriculture or is a member of an agricultural association	N/A
Slovakia	Not in use	N/A
Slovenia	Broad	Not included
Spain	Between the IAHS "narrow" and "broad" definitions	Not included
Sweden	Narrow	Not included
United Kingdom	Between the IAHS "narrow" and "broad" definitions	N/A

Source: UNECE (2005), *Survey on Agricultural Household Income Statistics.*

Ten countries (Denmark, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Netherlands, Poland and Sweden) replied to the UNECE survey that they used a "narrow" definition of an agricultural household in their published statistics. Finland and Slovenia replied that a "broad" definition of the agricultural household was used. Austria replied that the definition was based on a farm size criterion, while in Spain agriculture had to be the main income source of at least one member of the household, not necessarily the household head. Six countries stated explicitly that no definition of agricultural household was used (Estonia, France, Latvia, Luxembourg, Portugal and Slovakia).

These replies were not fully in accord with other information sources. It was known from the IAHS report (Eurostat, 2002) that Spain, France, and Finland had used "narrow" definitions when sending results to Eurostat and that seven EU Member States (Denmark, Germany, Greece, Ireland, Netherlands, Finland and Sweden) had generated results for both the "narrow" and "broad" definitions for at least one year for comparative purposes, with some striking findings in terms of numbers of households and income levels (see Focus Figure IX.1, Chapter IX, "Focus on European Union: Eurostat's IAHS statistics typology" of this Handbook).

Following the indications given in the TIAH/IAHS Manual, forestry and fishing were usually excluded from agricultural households in published statistics.

FOCUS PIECES

Eurostat (1995). *Manual of the Total Income of Agricultural Households (Rev.1)*. Theme 5 Series E. ISBN 92-827-5227-5. Eurostat, Luxembourg.
See also Eurostat (2002). *Income of the Agricultural Households Sector, 2001 Report*. Eurostat, Luxembourg.

Focus on the Definition of Agricultural Household: Non-EU Countries

Out of the 23 non-EU countries, in the UNECE 2004 survey 12 gave a definition of agricultural household (see Focus Table XIII.5). The majority gave a definition closer to the broad target definition in the IAHS Manual (Eurostat, 1995) than to the narrow definition, in the sense that reference is made to the household or any household member rather than to the reference person who is involved in agricultural activities. It then depends on the size of the thresholds whether the activity is likely to give rise to a large share of the household's income or not. No reference is usually made to the share of income coming from agricultural activities. In the Former Yugoslav Republic of Macedonia, a household is only classified as agricultural if all members of the household are engaged on the agricultural holding. If one or more members receive income from other sources then the household is classed as "mixed". In the Republic of Korea it is also necessary that all members be mainly engaged in farm work to be classified as full-time farm households.

Of the remaining countries, four explicitly stated that a definition for agricultural household did not exist (Albania, Belarus, New Zealand and Ukraine). The countries that did not provide a definition, but did not state explicitly that no definition of agricultural household was used, most probably did not use an official definition of agricultural household. Three countries that did not provide a definition gave detailed information on the socio-economic classification of households according to the main source of income of the reference person and had "agricultural workers" as one of the categories (Andorra, Azerbaijan and the Republic of Moldova). However, only the Republic of Moldova has a separate category for income from independent agricultural activity.

FOCUS TABLE XIII.5
Definition of agricultural household (narrow or broad) and inclusion of fishery/forestry in non-EU countries

COUNTRIES	NARROW/BROAD	FISHERY/FORESTRY
Albania	N/A	N/A
Andorra	No definition provided. However in the survey of family budgets the category "worker in agriculture" is one of the ten socio-professional groups based on the main source of income of the household reference person.	N/A
Armenia	N/A	N/A
Australia	N/A	N/A
Azerbaijan	No information on definition provided. However, the Household Budget Survey has information on main source of income of household head of which one is "hired workers in agriculture" and one is "work in household production".	N/A
Belarus	Not in use	N/A
Canada	Broad (i)	Excluded, unless household is also involved in agricultural activity.
Croatia	Broad (ii)	Included
Georgia	N/A	N/A
Japan	Household having cultivated land of 30 acres or over, or whose annual sales of agricultural products amount to 500,000 Yen and over.	Excluded
Kazakhstan	N/A	N/A
Kyrgyzstan	An agricultural household is a household in a rural area (according to the Territorial Classification of the Kyrgyz Republic SAOTO) and produce agricultural products.	Excluded
Mexico	Households in which agriculture is the main income source.	Excluded
New Zealand	Not currently applied.	N/A
Norway	Households having agricultural land or livestock. An agricultural household may have zero or negative income from agricultural activity and still be included in the statistics.	Households solely engaged in forestry and/or fisheries are not included.
Republic of Korea	Households with ten acres or more, or which raises livestock and sell products.	Excluded
Republic of Moldova	Household category "farmers": households whose heads have their main source of income from individual agricultural activity. Household category "employees in agricultural sector": households whose heads have their main source of income from remunerated agricultural activity.	N/A
Switzerland	N/A	N/A

The Former Yugoslav Rep. of Macedonia	See (iii)	Included
Turkey	Not in use.	N/A
Turkmenistan	Not in use.	N/A
Ukraine	Not in use. But information on types of activities is available so that households with income from agriculture, fisheries, forestry could be identified.	N/A
United States of America	A subset of households engaged in the operation of a farm business establishment (land under operating arrangement on which there are or could be sales of at least $ 1,000 annual worth of agricultural products). For purposes of the U.S. Department of Agriculture's Agricultural Resource Management Survey (ARMS), the definition refers to a household as "The operator, spouse and all individuals living in the operator's residence who share the financial resources of the farm operator. Students living away from home who are dependent upon the operator's household for support are included".	Excluded

Notes:

(i) One of the residents of the household must be a farm operator, as identified on the census of agriculture.

(ii) An agricultural household is every household that has an agricultural estate (over 10 ha) and whose members are involved in agriculture production.

(iii) A household with its own agricultural holding and all its members able to work are engaged on the holding as agricultural workers. None of the household members is officially employed outside the holding, none of them owns a store for trade and none of them is a pensioner, but one or more of its members can occasionally work outside the holding in order to earn some additional income. It also include agricultural workers with no land who work regularly on the holdings of other private agricultural workers; agricultural households with elderly members who own a holding, but are not capable of working, regardless of whether they pay for the cultivation of land, lease their land or give it to sharecroppers since their income comes from the holding and they do not have any other income; households whose members have acquired the right to receive agricultural pension on the basis of the Law on Retirement and Disability Insurance; agricultural households whose members are temporarily working abroad.

Source: UNECE (2004), *Survey on agricultural household income statistics.*

Focus on Equivalence Scales in EU Countries

In responses to the UNECE survey of 2005, thirteen countries used equivalence scales to convert the number of household members into consumer unit equivalent (see Focus Table XIII.6 below). With the exception of Luxembourg, the same coefficients were used for both adult men and adult women. The coefficient for the head of household was in general 1.0 in all countries for which data are available. In Hungary, a smaller coefficient (0.9) was used if the head of household was a pensioner. In Luxembourg, the coefficient depended on whether the head of household was male (1.0) or female (0.8) and, if the head of household was male, also on whether he was over or under 60 (0.8 if he was over 60). Coefficients for additional adults varied between 0.8 and 0.65. The coefficient for additional adults used in the majority of countries was 0.7.

In nine countries, the coefficient for children was 0.5 regardless of the age of the children. However, in Hungary, Portugal and Luxembourg the coefficient for children was age dependent (ranging from 0.2 to 0.8 in Luxembourg and Portugal and from 0.4 to 0.65 in Hungary). In most countries persons of age 14 and above were classified as adults. The exceptions were Denmark (17 years) and Italy (15 years).

FOCUS TABLE XIII.6
Equivalence scale used to give consumer in EU countries

COUNTRY	FIRST ADULT/HEAD OF HOUSEHOLD		OTHER ADULTS		CHILDREN	TRESHOLD AGE CHILD/ADULT
	MALE	FEMALE	MALE	FEMALE		
Austria						
Belgium						
Bulgaria						
Denmark	1	1	0.7	0.7	0.5	17
Estonia	1	1	0.8	0.8	0.8	
Finland	1	1	0.7	0.7	0.5	
France	1	1	0.7	0.7	0.5	14
Germany	1	1	0.7	0.7	0.5	14
Greece	1	1	0.7	0.7	0.5	14
Hungary	1.0; 0.9 if pensioner household	1.0; 0.9 if pensioner household	0.75; 0.65 if pensioner household	0.75; 0.65 if pensioner household	0.65; 0.5; 0.4	
Ireland	1	1	0.7	0.7	0.5	14
Italy	1	1	0.7	0.7	0.5	15
Latvia						
Lithuania						
Luxembourg	1.0; 0.8 if 60 and over	0.8	1.0; 0.8 if 60 and over	0.8	Seven age dependent coefficients ranging from 0.2 to 0.8	14
Netherlands						
Poland	1	1	0.7	0.7	0.5	14
Portugal	1	1	1.0; 0.8 if 60 and over	0.8	Seven age dependent coefficients ranging from 0.2 to 0.8	14
Romania						
Slovakia						
Slovenia						
Spain	1	1	0.7	0.7	0.5	14
Sweden						
United Kingdom						

Source: UNECE (2005), *Survey on Agricultural Household Income Statistics.*

Focus on Equivalence Scales in Non-EU Countries

Eight of the countries that replied to the UNECE questionnaire of 2005 gave details on the equivalence scales used (see Focus Table XIII.7). In general, a coefficient of 1.0 was used for the first adult. In Armenia, the coefficient for the first adult was 1.0 if male and 0.8 if female. In Georgia, the coefficient depended both on the sex of the first adult and age, with people over 60 getting a lower coefficient. The coefficient used for additional adults varied between 0.5 in Croatia and 1.0 for males in Armenia. With the exception of Georgia, countries used just one coefficient for children, regardless of age. In most countries this coefficient for children was 0.5. Countries that did not use 0.5 included Croatia (0.3), Kazakhstan (0.8) and Ukraine (0.7). Only five countries provided information on the age from which persons were classified as adult. Two used a threshold of 14 years (Azerbaijan and Belarus), one used 15 years (Armenia) and two used 16 years (Georgia and Republic of Moldova).

FOCUS TABLE XIII.7
Equivalence scale used to give consumer in non-EU countries

COUNTRY	FIRST ADULT/HEAD OF HOUSEHOLD		OTHER ADULTS		CHILDREN	TRESHOLD AGE CHILD/ADULT
	MALE	FEMALE	MALE	FEMALE		
Albania						
Andorra						
Armenia	1	0.8	1	0.8	0.5	15
Australia						
Azerbaijan	1	1	0.7	0.7	0.5	14
Belarus	1	1	0.75	0.75	0.5	14
Canada						
Croatia	1	1	0.5	0.5	0.3	
Georgia	1.0 if between 16 and 60; 0.88 if over 60	0.84 between 16 and 60; 0.76 if over 60	1.0 if between 16 and 60; 0.88 over 60	0.84 if between 16 and 60; 0.76 if over 60	1.0 if between 7 and 16; 0.64 if 0 to 7	16
Japan						
Kazakhstan	1	1	0.8	0.8	0.8	
Kyrgyzstan						
Mexico						
New Zealand						
Norway						
Republic of Korea						
Republic of Moldova	1	1	0.7	0.7	0.5	16
Switzerland						
FYROM (*)						
Turkey						
Turkmenistan						
Ukraine	1	1	0.7	0.7	0.7	
United States of America						

(*) The former Yugoslav Republic of Macedonia

Source: UNECE (2005). *Survey on Agricultural Household Income Statistics.*

Focus on the Definition of Net Disposable Income for Agricultural Households. Other OECD/UNECE Countries (Non-EU25 Member States)

FOCUS TABLE XIII.8 (part 1)
Calculation of Net Disposable Income of Agriculture Households in non-EU

		Albania	Andorra	Armenia	Australia	Azerbaijan	Belarus	Bulgaria	Canada 1/	Croatia
	Number of households	y	n/a	n/a	y	y	y	y	y	y
	Number of persons	y	n/a	n/a	y	y	y	y	y	y
	Number of consumer units	y	n/a	n/a		y	y			
1	**FROM INDIPENDENT ACTIVITIY**	**(y) and (*)**	**n/a**	**n/a**						
1a	From independent agricultural activity		n/a	n/a		y		y		
	Net Operating Surplus		n/a	n/a		@		y	y	y
	Income		n/a	n/a	1/	y		y		y
1b	From independent non-agricultural activity		n/a	n/a		y		y		
	Net Operating Surplus		n/a	n/a		@		-	y	y
	Income		n/a	n/a	2/	y		-		y
1c	Net Operating Surplus from imputed rental value of owner-dwellings		n/a	n/a		@				
2	**DEPENDENT ACTIVITY of which**	**(y) and (*)**	**n/a**	**n/a**						*
2a	Wages and salaries	(y) and (*)	n/a	n/a	y	y	y	y	y	*
2b	Employer's actual social contributions	(y) and (*)	n/a	n/a		y		y		*
2c	Imputed social contributions		n/a	n/a		y		-		*
3	**PROPERTY INCOME RECEIVED of which**	*	**n/a**	**n/a**				**y**	**y**	
3a	Interest		n/a	n/a	y	y	y	y	y	*
3b	Dividends		n/a	n/a	y	y	y	y	y	*
3c	Withdrawals from quasi-corporations		n/a	n/a	*	@		-	y	*
3d	Property income attributed to insurance policy holders		n/a	n/a		y		y	y	*

3e	Rents on land and subsoil assets		n/a	n/a	*	y		y	y	*
4	**NON-LIFE INSURANCE CLAIMS**	*****	**n/a**	**n/a**				**y**		
4a	Claims on capital items		n/a	n/a		@		y		*
4b	Claims on personal accident		n/a	n/a		@		y		*
5	**SOCIAL BENEFITS received (other than social transfers in kind)**	**(y) and (*)**	**n/a**	**n/a**	**y**	**y**	**y**	**y**	**y**	**(y) and (*)**
6	**MISCELLANEUS INWARD CURRENT TRANSFERS**	**(*)**	**n/a**	**n/a**	**y**	**y**	**y**	**y**		*****
7	**CURRENT RECEIPTS Sum of 1-6**	**(*)**	**n/a**	**n/a**		**y**		**y**		
8	**PROPERTY INCOME PAID of which**	**(*)**	**n/a**	**n/a**				**y**		
8a	Interest of loans for		n/a	n/a		y		y		
	(i) farming purpose		n/a	n/a		@			y 2/	*
	(ii) purchase of agriculture land and		n/a	n/a		@			y 2/	*
	(iii) other business purposes		n/a	n/a		@			y 2/	*
	(iv) private and other credit		n/a	n/a		@			y 2/	*
8b	Rents on	(*)	n/a	n/a				-		
	(i)Agricultural land and buildings	n/a	n/a		y		y	y	*	
	(ii) other business land and buildings	n/a	n/a		y		y	y	*	
9	**NET NON-LIFE INSURANCE PREMIUMS**	**(*)**	**n/a**	**n/a**		**y**		**y**		*****
10	**CURRENT TAXES ON INCOMES AND WEALTH of which**	**(*)**	**n/a**	**n/a**		**y**		**y**		
10a	On income		n/a	n/a	y (imputed)	y		y		y
10b	On capital gains		n/a	n/a		@		-		*
10c	On capital or wealth		n/a	n/a		@		y		y
10d	On private use of vehicles etc.		n/a	n/a		@		-		y
11	**SOCIAL CONTRIBUTIONS of which**	**(*)**	**n/a**	**n/a**				**y**		
11a	Actual		n/a	n/a		@		-		

	(i) Employers' actual social contributions		n/a	n/a		@		-	*
	(ii) Employers' social contributions		n/a	n/a		@		-	*
	(iii) by self-employed and non-employed		n/a	n/a		@		-	*
11b	Imputed		n/a	n/a		@		-	*
12	**MISCELLANEOUS OUTGOING CURRENT TRANSFERS of which**	**(*)**	**n/a**	**n/a**		**@**		**y**	
12a	To NPISHs		n/a	n/a		@		-	*
12b	Between households		n/a	n/a		y	y	-	*
12c	other		n/a	n/a		y		-	*
13	**NET DISPOSABLE INCOME (7minus 8-12) OR ANOTHER DEFINED CONCEPT**	**(*)**	**n/a**	**n/a**		**y**		**y**	
14	**SOCIAL TRANSFERS IN KIND**	**(*)**	**n/a**	**n/a**	**Y (imputed for HIES only)**	**y**	**y**	**y**	**(y) and (*)**
15	**NET ADJUSTED DISPOSABLE INCOME**	**(*)**	**n/a**	**n/a**		**@**		**y**	

Notes:
y = yes, explicit data
* = implied data covered elsewhere
(y) and (*) = covered in part
@ = gross of capital consumption

Australia: 1/ Number of consumer units could be calculated but isn't

Australia: 2/ Income from independent activity – income from unincorporated business (including sole traders and partnerships) is measured in the survey as the profit or loss of the business. Profit /loss consists on the value of gross output of the enterprise after the deduction of operating expenses (including depreciation). This income is not able to be split by whether it relates to agricultural or non agricultural activity.

Canada: 1/ Data in the table is based on the Census of Agriculture. A separate table is available with information on income from all data sources in Canada.

Canada: 2/ Property income received and interest loans as a group not individually.

Croatia: There is no income data classified by the socio-economic type of the household.

Source: *UNECE survey on agriculture household income*

FOCUS TABLE XIII.8 (part 2)
Calculation of Net Disposable Income of Agriculture Households in non-EU

		Georgia 1/	Japan	Kazakhstan	Kyrgyzstan	Mexico	New Zealand	Norway	Republic of Korea
	Number of households	y	n	n/a	y	y	y		y
	Number of persons	y	n	n/a	y	y	y		y
	Number of consumer units	y	n	n/a		y			n
1	**FROM INDEPENDENT ACTIVITIY**			**n/a**				**y**	**y**
1a	From independent agricultural activity			n/a		y		y	y
	Net Operating Surplus		y	n/a		y*	y*1/	y	y
	Income	y	y	n/a		y		y	y
1b	From independent non-agricultural activity			n/a		y		y	y
	Net Operating Surplus		y	n/a		y*	y*	y	y
	Income	y	y	n/a		y		y	y
1c	Net Operating Surplus from imputed rental value of owner-dwellings		y	n/a		y		(y) and (*)	n
2	**DEPENDENT ACTIVITY of which**			**n/a**					**(y) and (*)**
2a	Wages and salaries	y	y*	n/a		y	y	y	y
2b	Employer's actual social contributions		y	n/a		y*			n
2c	Imputed social contributions		y	n/a		y*			n
3	**PROPERTY INCOME RECEIVED of which**	**y**		**n/a**					**y**
3a	Interest		y	n/a		y	y	y	y
3b	Dividends		y	n/a		y	y	y	y
3c	Withdrawals from quasi-corporations		y	n/a		y	(y)	y	y
3d	Property income attributed to insurance policy holders		y	n/a		y		y	y
3e	Rents on land and subsoil assets		y	n/a		y	y		(y) and (*)
4	**NON-LIFE INSURANCE CLAIMS**			**n/a**					**(y) and (*)**
4a	Claims on capital items		y	n/a		y			n

4b	Claims on personal accident		y	n/a		y		Y
5	**SOCIAL BENEFITS received (other than social transfers in kind)**	**y**	**y**	**n/a**		**y**	**y**	**y**
6	**MISCELLANEUS INWARD CURRENT TRANSFERS**	**y**	**y**	**n/a**		**y**	**y**	**y**
7	**CURRENT RECEIPTS Sum of 1-6**		**y**	**n/a**		**y**	**y(except 4)**	**y**	**(y) and (*)**
8	**PROPERTY INCOME PAID of which**			**n/a**					**y**
8a	Interest of loans for			n/a			y2/	y	y
	(i) farming purpose		y	n/a		y		*	y
	(ii) purchase of agriculture land and		y	n/a		y		*	y
	(iii) other business purposes		y	n/a		y		*	y
	(iv) private and other credit		y	n/a		y		*	y
8b	Rents on			n/a			y		(y) and (*)
	(i)Agricultural land and buildings		y	n/a		y			(y) and (*)
	(ii) other business land and buildings		y	n/a		y			(y) and (*)
9	**NET NON-LIFE INSURANCE PREMIUMS**		**y**	**n/a**			**y 3/**		**y**
10	**CURRENT TAXES ON INCOMES AND WEALTH of which**			**n/a**				**y**	**(y) and (*)**
10a	On income		y	n/a			y	y	(y) and (*)
10b	On capital gains		y	n/a				*	(y) and (*)
10c	On capital or wealth		y	n/a		y*		y	(y) and (*)
10d	On private use of vehicles etc.		y	n/a		y		*	(y) and (*)
11	**SOCIAL CONTRIBUTIONS of which**			**n/a**					**n**
11a	Actual			n/a					n
	(i) Employers' actual social contributions		y	n/a		y*			n
	(ii) Employers' social contributions		y	n/a					n
	(iii) by self-employed and non-employed		y	n/a				y	n
11b	Imputed		y	n/a		y*			n
12	**MISCELLANEOUS OUTGOING**			**n/a**					**(y) and (*)**

	CURRENT TRANSFERS of which						
12a	To NPISHs	?	n/a	y			n
12b	Between households	y	n/a	y		y	(y) and (*)
12c	other	y	n/a	y			(y) and (*)
13	**NET DISPOSABLE INCOME (7minus 8-12) OR ANOTHER DEFINED CONCEPT**	**y**	**n/a**	**y***	**y (7 minutes 10a)**	**y**	**n**
14	**SOCIAL TRANSFERS IN KIND**	**y**	**n/a**	**y**			**n**
15	**NET ADJUSTED DISPOSABLE INCOME**	**y**	**n/a**	**y**			**n**

Notes:
y = yes, explicit data
* = implied data covered elsewhere
(y) and (*) = covered in part
@ = gross of capital consumption

Georgia: Information not provided in this form but information taken from a different table which was provided.

Kazakhstan: Data for money incomes being of low quality, the level of incomes has therefore been evaluated since 2001 on the basis of expenditure on consumption plus a monetary estimate of consumption by household members of produce from private plots.

Kyrgyzstan: Net disposable income not calculated.

New Zealand: 1/ Net operating surplus doesn't differentiate between agricultural and non agricultural activity.

New Zealand: 2/ Interest on loans and rents are classified as expenditure.

New Zealand: 3/ Insurance premiums are estimated.

Republic of Korea: Disposable income = Farm household income – non consumption expenditures (taxes & dues, remittance by family, other cash and gift donation, etc.)

Source: UNECE, *Survey on agriculture household income.*

FOCUS TABLE XIII.8 (part 3)
Calculation of Net Disposable Income of Agriculture Households in non-EU

		Republic of Moldova	Romania	Switzerland	The former Yugoslav Rep. of Macedonia	Turkey	Turkmenistan	Ukraine	United States of America
	Number of households	y	y	n/a	y	n/a	y	y	y
	Number of persons	y	Y	n/a	y	n/a	y	y	y
	Number of consumer units	y	n	n/a		n/a		y	Not calculated
1	**FROM INDIPENDENT ACTIVITIY**			**n/a**	**y**	**n/a**		**y**	**y**
1a	From independent agricultural activity	y		n/a	y	n/a	y		y
	Net Operating Surplus	y	N	n/a		n/a			y
	Income	n	Y	n/a		n/a	y	y	y
1b	From independent non-agricultural activity	y		n/a		n/a	y	y	
	Net Operating Surplus	y	N	n/a		n/a			
	Income	n	Y	n/a		n/a		y	y
1c	Net Operating Surplus from imputed rental value of owner-dwellings	n	N	n/a		n/a	y		y
2	**DEPENDENT ACTIVITY of which**		**Y**	**n/a**	**y**	**n/a**			**y**
2a	Wages and salaries	y	Y	n/a	y	n/a	y	y	y
2b	Employer's actual social contributions	n	N	n/a		n/a			
2c	Imputed social contributions	n	N	n/a		n/a	y	y	
3	**PROPERTY INCOME RECEIVED of which**	**y**	**Y**	**n/a**	**y**	**n/a**			**y**
3a	Interest	y	Y	n/a		n/a	y	y	y
3b	Dividends	y	Y	n/a	y	n/a	y	y	y
3c	Withdrawals from quasi-corporations	n	N	n/a		n/a			
3d	Property income attributed to insurance policy holders	n	Y	n/a		n/a	y	y	
3e	Rents on land and subsoil assets	y	Y	n/a	y	n/a	y	y	y

4	**NON-LIFE INSURANCE CLAIMS**	**n**	**1/**	**n/a**	**y**	**n/a**	**y**		
4a	Claims on capital items	n		n/a	y	n/a			
4b	Claims on personal accident	n		n/a	y	n/a			
5	**SOCIAL BENEFITS received (other than social transfers in kind)**	**y**	**y**	**n/a**	**y**	**n/a**	**(y) and (*)**	**y**	
6	**MISCELLANEUS INWARD CURRENT TRANSFERS**	**y**	**2/**	**n/a**	**y**	**n/a**		**y**	**y**
7	**CURRENT RECEIPTS Sum of 1-6**	*****		**n/a**	**y**	**n/a**		**y**	**y**
8	**PROPERTY INCOME PAID of which**	*****		**n/a**		**n/a**			**Y**
8a	Interest of loans for	*	3/	n/a		n/a			
	(i) farming purpose	*		n/a		n/a			y
	(ii) purchase of agriculture land and	*	N	n/a		n/a	y		y
	(iii) other business purposes	*	4/	n/a		n/a			y
	(iv) private nd other credit	*	Y	n/a		n/a	y		
8b	Rents on	n		n/a		n/a			
	(i)Agricultural land and buildings	n	y	n/a		n/a	(y) and (*)		y
	(ii) other business land and buildings	n	y	n/a		n/a	(y) and (*)		
9	**NET NON-LIFE INSURANCE PREMIUMS**	**n**	**y**	**n/a**		**n/a**			
10	CURRENT TAXES ON INCOMES AND WEALTH of which	n	n	n/a		n/a			
10a	On income	n		n/a		n/a	y		
10b	On capital gains			n/a		n/a			
10c	On capital or wealth	-	n	n/a		n/a			
10d	On private use of vehicles etc.	-	y	n/a		n/a	(y) and (*)		
11	**SOCIAL CONTRIBUTIONS of which**	**-**	**y**	**n/a**		**n/a**			
11a	Actual	-	N	n/a		n/a			
	(i) Employers' actual social contributions	-		n/a		n/a			
	(ii) Employers' social contributions	-		n/a		n/a			
	(iii) by self-employed and non-employed	-	Y	n/a		n/a			

11b	Imputed	-		n/a		n/a			
12	**MISCELLANEOUS OUTGOING CURRENT TRANSFERS of which**	**y**		**n/a**		**n/a**			
12a	To NPISHs	n	5/	n/a		n/a			
12b	Between households	y		n/a		n/a		?	
12c	other			n/a				?	
13	**NET DISPOSABLE INCOME (7minus 8-12) OR ANOTHER DEFINED CONCEPT**	**y**		**n/a**	**y**	**n/a**			
14	**SOCIAL TRANSFERS IN KIND**	**-**		**n/a**	**y**	**n/a**	**y**		
15	**NET ADJUSTED DISPOSABLE INCOME**	**y**		**n/a**		**n/a**			

Notes:
y = yes, explicit data
* = implied data covered elsewhere
(y) and (*) = covered in part
@ = gross of capital consumption

Romania: 1/ Sums cashed as compensation within the insurance for goods and persons.

Romania: 2/ Amounts received from persons outside the household and amounts received monthly from non-profits societies.

Romania: 3/ The payment of interest for loans taken for own dwellings, loans from banks and from the "Mutual Benefit fund", from credit co-ops, loans from private people or economic agents etc.

Romania: 4/ Payment of rent for buildings rented from state, payment of rent for furnished and non-furnished dwellings.

Romania: 5/ Equivalent value of in-kind income obtained by employees, equivalent value of in-kind incomes obtained by beneficiaries of social benefit allowances

Switzerland: Income of the agriculture households sector activity removed from statistical program in 2003.

United States: Number of consumer units could be calculated but isn't.

Source: UNECE (2005). *Survey on agriculture household income.*

Focus on the Definition of Net Disposable Income for Agricultural Households. EU-25 Member States

FOCUS TABLE XIII.9 (part 1)
Calculation of Net Disposable Income of Agriculture Households in EU countries

		Austria (IAHS)	Belgium (IAHS)	Denmark (IAHS)	Estonia	Finland	France (IAHS)	Germany (IAHS)	Greece (IAHS)	Hungary	Ireland	Italy
	Number of households	y[vii]	y	y	y	y	y	y	y	y	y	y
	Number of persons		y	y	y	y	y	y	y	y	y	y
	Number of consumer units			y	y	y	y	y	y		y	y
1	**FROM INDIPENDENT ACTIVITIY**	**y**	**y**	**y**		**y**	**y**	**y**	**y**	**y@**	**y**	**y**
1a	From independent agricultural activity									y@		
	Net Operating Surplus		y	y	(y) and (*)				y	y@		y
	Income	y			y		y	y			y	y
1b	From independent non-agricultural activity					y				y@		
	Net Operating Surplus		y	y	(y) and (*)				y	y@		y
	Income	y			y		y	y			y	y
1c	Net Operating Surplus from imputed rental value of owner-dwellings		y	y[i]	@	y	y	y	y			y
2	**DEPENDENT ACTIVITY of which**	**y**	**y**	**y**		**y**	**y**	**y**	**y**	**y**	**y**	**y**
2a	Wages and salaries		y	y	y	y	*	y	y	y	y	
2b	Employer's actual social contributions				(y) and (*)		*	Y	y[ii]			
2c	Imputed social contributions				(y) and (*)		*	Y				
3	**PROPERTY INCOME RECEIVED of which**	*	**y**	**y**		**y**	**y**	**y**	**y**	**y**	**y**	**y**
3a	Interest	?	y	*	y	y	y	*	y	y	*	
3b	Dividends	?	*		y	y	y	*	y	y	*	
3c	Withdrawals from quasi-corporations		*	*	(y) and (*)	*	*	(*)	*		*	
3d	Property income attributed to insurance policy holders		y		(y) and (*)		y	*	*			
3e	Rents on land and subsoil assets	*	*	*	y	*	y	*	y		*	
4	**NON-LIFE INSURANCE CLAIMS**		**y**				**y**	**y**	**y**			**y**
4a	Claims on capital items		*		(y) and (*)			*				
4b	Claims on personal accident		*		(y) and (*)			*				
5	**SOCIAL BENEFITS received (other than social transfers in kind)**	**y**	**y**	**y**	**y**	**y**	**y**	**y**	**y**	**y**	**y**	**y**
6	**MISCELLANEUS INWARD CURRENT TRANSFERS**		**y**	**y**	**y**	**y**	**y**	**Y**	**y**	**y**	**y**	**y**

		Austria (IAHS)	Belgium (IAHS)	Denmark (IAHS)	Estonia	Finland	France (IAHS)	Germany (IAHS)	Greece (IAHS)	Hungary	Ireland	Italy
7	**CURRENT RECEIPTS Sum of 1-6**	**y**	**y**	**y**	**(y) and (*)**	**y**		**y**	**y**	**y**		**y**
8	**PROPERTY INCOME PAID of which**	*****	**y**	**y**		*****	**y**		**y**		*****	**y**
8a	Interest of loans for		y	*		*	y		Y			
	(i) farming purpose		y	*	(y) and (*)	*	*	*	*		*	
	(ii) purchase of agriculture land and		*	*	(y) and (*)	*	*	*	*			
	(iii) other business purposes		*	*	(y) and (*)	*	*	*	*		*	
	(iv) private and other credit		y	*	(y) and (*)			Y	*		*	
8b	Rents on		y			*	y		**y***			
	(i)Agricultural land and buildings	n/a	y	*	(y) and (*)	*	*	*	*		*	
	(ii) other business land and buildings	n/a		*	(y) and (*)	*	*	*	*iii		*	
9	**NET NON-LIFE INSURANCE PREMIUMS**	*****	**y**		(y) and (*)		*****	**y**	**y**			**y**
10	**CURRENT TAXES ON INCOMES AND WEALTH of which**	**y**	**y**	**y**		**y**	**y**	**y**	**y**	**y**	**y**	**y**
10a	On income		y		(y) and (*)	*	y	*	Y	y	*	
10b	On capital gains				(y) and (*)	*	y	*			*	
10c	On capital or wealth				(y) and (*)	*	y	*			*	
10d	On private use of vehicles etc.				-		y	*				
11	**SOCIAL CONTRIBUTIONS of which**	**y**	**y**	**y**		**y**	*****	**y**		**y**	**y**	**y**
11a	Actual		y			y	*	y		y	Y	
	(i) Employers' actual social contributions				(y) and (*)		*	y				
	(ii) Employers' social contributions				(y) and (*)	y	*	y			*	
	(iii) by self-employed and non-employed	y	y		(y) and (*)		*	y			*	
11b	Imputed				Y		*	y				
12	**MISCELLANEOUS OUTGOING CURRENT TRANSFERS of which**		**y**			*****	*****	**y**			**y**	**y**
12a	To NPISHs				@		*	*			*	
12b	Between households		y		Y	*	*	*				
12c	Other		y		Y		y	*			(*)	
13	**NET DISPOSABLE INCOME (7 minus 8-12) OR ANOTHER DEFINED CONCEPT**	**y**	**y**	**y**	**(y) and (*)**	**y**	**y**	**y**	**y**		**y**	**y**

14	**SOCIAL TRANSFERS IN KIND**	**(y) and (*)**
15	**NET ADJUSTED DISPOSABLE INCOME**	**(y) and (*)**

Notes:
y = yes, explicit data
* = implied data covered elsewhere
(y) and (*) = covered in part
@ = gross of capital consumption

Source: UNECE, *Survey on agriculture household income.*

FOCUS TABLE XIII.9 (part 2)
Calculation of Net Disposable Income of Agriculture Households in EU countries

		Luxemb. (IAHS)	Latvia	Lithuania	Netherlands	Poland	Portugal (IAHS)	Slovakia	Slovenia	Spain (IAHS)	Sweden	United Kingdom
	Number of households	y	y	y	y		y	No info		y	y	y
	Number of persons	y	y	y	y		y	No info		y	y	
	Number of consumer units	y			y		y	No info		y		
1	**FROM INDIPENDENT ACTIVITIY**	**y**	**y**		**y**		**y**	**No info**	**y**	**y**	**y**	**y**
1a	From independent agricultural activity		y	y				No info	y			
	Net Operating Surplus	y	y	y	y	-	*(@)	No info		y		
	Income		y	y		y		No info				
1b	From independent non-agricultural activity			y				No info	y		*	y
	Net Operating Surplus	y		y	y	-	*(@)	No info	y	*		
	Income		y	y		y		No info			*	y
1c	Net Operating Surplus from imputed rental value of owner-dwellings	y	y		y	-	y	No info	y	y	y	
2	**DEPENDENT ACTIVITY of which**	**y**	**y**		**y**		**y**	**No info**		**y**	**y**	**y**
2a	Wages and salaries		y	y	y	y		No info	y	y	y	y
2b	Employer's actual social contributions				y	-		No info	y	y		
2c	Imputed social contributions				*	-		No info		y	y	
3	**PROPERTY INCOME RECEIVED of which**	**y**	**y**		**y**		**y**	**No info**		**y**	**y**	**y**
3a	Interest	y	y	(y) and (*)	y	y		No info	y	y		*
3b	Dividends	y	y	y	y	y		No info	y	*		*
3c	Withdrawals from quasi-corporations					y		No info		*		

		Luxemb. (IAHS)	Latvia	Lithuania	Netherlands	Poland	Portugal (IAHS)	Slovakia	Slovenia	Spain (IAHS)	Sweden	United Kingdom
3d	Property income attributed to insurance policy holders					-		No info	*			
3e	Rents on land and subsoil assets	y	y	y	*	y		No info	y	y		*
4	**NON-LIFE INSURANCE CLAIMS**	**y**					**y**	**No info**		**y**	*	
4a	Claims on capital items	y				y		No info	*			
4b	Claims on personal accident	y		y		y		No info	*			*
5	**SOCIAL BENEFITS received (other than social transfers in kind)**	**y**		**y**	**y**	**y**	**y**	**No info**	**y**	**y**	**y**	**(y)**
6	**MISCELLANEUS INWARD CURRENT TRANSFERS**			**y**	**y**	**y**	**y**	**No info**	*	**y**	**(*)**	
7	**CURRENT RECEIPTS Sum of 1-6**	**y**		**y**	**y**		**y**	**No info**		**y**	**y**	**y**
8	**PROPERTY INCOME PAID of which**	**y**	**y**		**y**		**y**	**No info**		**y**	**y**	*
8a	Interest of loans for				y			No info		y		
	(i) farming purpose	y	y	(y) and (*)	*	-		No info	y	*		y
	(ii) purchase of agriculture land and		y		*	-		No info		*		*
	(iii) other business purposes		y		*	-		No info	y	*		*
	(iv) private and other credit	y			*	-		No info	y	*		
8b	Rents on				y			No info				
	(i)Agricultural land and buildings	y	y	y	*	-		No info	y			y
	(ii) other business land and buildings				*			No info				*
9	**NET NON-LIFE INSURANCE PREMIUMS**	**y**					**y**	**No info**		**y**	**(*)**	
10	**CURRENT TAXES ON INCOMES AND WEALTH of which**	**y**			**y**		**y**	**No info**		**y**	**y**	
10a	On income	y			y	-	*	No info	y	*		
10b	On capital gains					-		No info	y	*		
10c	On capital or wealth	y			y	y	*	No info		y		
10d	On private use of vehicles etc.	**y**			*	y		No info		y		
11	**SOCIAL CONTRIBUTIONS of which**	**y**		**y**	**y**		**y**	**No info**		**y**	**y**	
11a	Actual	y		y	*			No info		y		
	(i) Employers' actual social contributions			(y) and (*)	*	-		No info	y	y		
	(ii) Employers' social contributions				*	-		No info		y		

		Luxemb. (IAHS)	Latvia	Lithuania	Netherlands	Poland	Portugal (IAHS)	Slovakia	Slovenia	Spain (IAHS)	Swede n	United Kingdo m
	(iii) by self-employed and non-employed			(y) and (*)	*	-		No info	y	y		
11b	Imputed				*	-		No info		y		
12	**MISCELLANEOUS OUTGOING CURRENT TRANSFERS of which**	**y**		**y**	**y**		**y**	**No info**		**y**	**(y)**	
12a	To NPISHs				*	y		No info		y		
12b	Between households			(y) and (*)	y	y		No info	y	y		
12c	other	y		y	y	y		No info		y		
13	**NET DISPOSABLE INCOME (7minus 8-12) OR ANOTHER DEFINED CONCEPT**	**y**		**y**	**y**	**7-(8b+10cd+12)**	**y**	**No info**		**y**	**y**	
14	**SOCIAL TRANSFERS IN KIND**			**(y) and (*)**		**-**		**No info**	*****	**y**		
15	**NET ADJUSTED DISPOSABLE INCOME**			**y**		**-**		**No info**		**y**		

Notes:

y = yes, explicit data
* = implied data covered elsewhere
(y) and (*) = covered in part
@ = gross of capital consumption

Source: UNECE (2005). *Survey on agriculture household income.*

Focus on the Definition of Household in Selected Developing Countries

In responses to the questionnaire circulated by the UNECE in 2005 there is no uniformity in the definition of the household across different surveys in developing countries, although all involve some form of living and eating together (see Focus Table XIII.10). Some definitions incorporate the pooling of funds. Unfortunately, different criteria are often in conflict, and household arrangements are often not constant over time. Many of the problems are associated with the complex structure of living arrangements in developing countries. As noted in Chapter IX of this Handbook, when men have several wives, each wife often runs what is effectively a separate household within a larger compound presided over by the husband. Even without polyandry, several generations of the families of siblings may live in a single compound, sometimes eating together and sometimes not, and with the group breaking up and reforming in response to economic conditions. In some countries, there are lineages to which groups of households belong, and the head of the lineage may have power to command labour, to order migration, to tax and reward individuals, and to control communal assets. Even so, members of the lineage will typically live in separate households, which may not be the appropriate units for the analysis of at least some decisions (Deaton, 1997). An overall view of the characteristics of the definitions is given in Focus Table XIII.10 below.

A decision to separate previously pooled households should not affect estimates of average consumption or income per head, but will increase measures of inequality, since the previous single estimate for the pooled household is replaced by multiple estimates for each of the sub-households. Splitting households has the same effect on the distribution of income or consumption as an increase in dispersion with no change in mean, and so must increase measures of inequality (Deaton, 1997).

From Focus Table XIII.11 it appears that all the (non-randomly) selected developing countries in the sample use common dwelling as the main criteria in their definition of household, while de-emphasizing the necessity of a family link. Moreover, most of the sampled developing countries do make reference either explicitly or implicitly to shared budget and food/meals in their definition of a household within the framework of the Living Conditions Surveys.

FOCUS TABLE XIII.10
Definition of household in a selected group of developing countries

COUNTRY	DEFINITION OF HOUSEHOLD
Brazil	**A household** is defined a the person or collection of persons, whether related or not, that habitually live in the same private dwelling, occupying in part or in whole, and that tend to their life needs together.
China	**Household members** were defined to include "all the people who normally live and eat heir meals together in this dwelling". Those who were absent more than nine of the last twelve months were excluded, except for the head of the household.
Ghana	**A household** was defined as a group of people who leave usually slept in the same dwelling and taken their meals together for *at least 9 of the 12 months* preceding the interview.
India	**A household** is defined as a group of people who normally live and eat their meals together. For the purpose of this survey, "normally" is taken to mean that the person concerned has lived in the household for at least 3 of the past 12 months.
Jamaica	**A household** consists of one person who lives alone or a group of persons, who, as a unit, jointly occupy the whole or part of a dwelling unit, who have common arrangements for housekeeping, and who generally share at least one meal. The household may be composed of related persons only, of unrelated persons, or of a combination of both.
Morocco	A household is defined to include all those individuals for whom the household is their primary residence, and who are economically dependent on the household. Household members also include: individuals who are not physically present but whose absence has been for *less than one month*.
Peru	**The household** is defined as the person or collection of persons, whether related or not, that habitually live in the same private dwelling, occupying in part or in whole, and that tend to their life needs together.
South Africa	**The first definition of the household** comprises individuals who: (I) live under this "roof" or within the same compound/homestead/ stand at least 15 days out of the past year, and (II) when they are together they share food from a common source (i.e. they cook and eat together); and (III) contribute to or share in, a common resource pool (i. e. they contribute to the household through wages and salaries or other cash and in-kind income or they may be benefiting from this income but not contributing to it, i.e. children, and other non-economically active people in the household). Visitors were excluded from this definition. **The second definition of the household** includes only members who had lived "under this roof for more than 15 days of the last 30 days". The definition was derived to eliminate double-counting of individuals.
Vietnam	**Household members** were defined generally to include "all people who normally live and eat their meals together in this house and have done so for 6 or more months out of the past year" which is the same as in 1992-93. However, specific cases to include as members or exclude as non-members differ slightly from 1992-93 and are listed in the questionnaire.
Zambia	**A household** is defined as a group of persons who normally eat and live together. These people may or may not be related by blood, but more common provision for food or other essential living, and they have only one person whom they all regard as the head of the household. A household may comprise several members and in some cases may have only one member. **Usual member of the household** – The de jure approach was adopted for collecting data on household composition. It relies on the concept of usual residence. A usual member of household was considered to be one who had been living with a household for at least 6 months. Newly married couples were regarded as usual members of the household even if one or both of them had been in the household for less than 6 months. Newly born babies of usual members were also considered as usual members of the household. Members of the household who were at boarding schools or temporarily away from the household, e. g. away on seasonal work, in hospital, away to give birth, visiting relatives of friends, but who normally live and eat together, were included in the list of usual members of the household.

FOCUS TABLE XIII.11
Definition of household in selected developing countries

	REFERENCE TO				
COUNTRY	COMMON DWELLING	SHARED BUDGET	SHARED FOOD / MEALS	FAMILY LINK NECESSARY	STUDENTS / TEMPORARILY ABSENT
Target definition (from TIAH Manual Rev. 1, par. 2.4.1)	yes	yes	yes	no	not mentioned
Brazil	yes	(yes)	(yes)	no	no more than 12 months
China	yes	(yes)	yes	no	no more than 9 of the last 12 months
Ghana	yes	(yes)	yes	no	no more than 3 of the 12 months
India	yes	(yes)	yes	no	not more than 9 of the last 12 months
Jamaica	yes	yes	yes	no	not mentioned
Morocco	yes	(yes)	yes	no	absent for less than one month
Peru	yes	(yes)	(yes)	no	at least 3 of the last 12 months
South Africa	yes	yes	yes	no	at least 15 days out of the past year or more than 15 days of the past 30 days
Vietnam	yes	(yes)	yes	no	less than 6 of the past 12 months
Zambia	yes	yes	yes	no	at least six months

Note: information extracted from official websites.
Source: UNECE (2005), *Survey on Agricultural Household Income Statistics.*

In certain provinces of **Zambia** households are characterized by being polygamous, e.g. a man living in a village with several wives each living with her children in a separate hut or group of huts should be regarded as separate households if each wife cooks and eats meals separately. In this case, even if they sometimes eat together, the fact remains that the wives are running separate households. Therefore, they are treated as different households. On the other hand, a man living in a village with several wives, each living with her children in a separate hut or group of huts, is regarded as one household if all those wives cook and eat together.

The Zambian Living Conditions Monitoring Survey uses the *de jure* ("usual") system of enumeration as opposed to *de facto* ("as of previous night") system. A "usual" member of household is defined as one who has been living with a household for at least six months. He/she may or may not be related to the other household members by blood or marriage, and may be a house helper or labourer. A usual household member normally lives together with other household members in one house or closely related premises and takes his/her meals from the same kitchen. Newly married couples are to be regarded as usual members of the households even if one of them has been in the household for less than six months.

Members of the household who are at boarding schools or any other persons temporarily away from the household who normally live and eat there such as persons

temporarily away for seasonal work, because of illness, giving birth, visiting relatives or friends have to be included in the list of usual members of the household. Any other persons such as visitors who have spent at least six months with the household also have to be included as usual members of the household. Other persons such as servants and lodgers who are part of this household must be taken as usual members (CSO, 1996).

In **Ghana**'s Living Standards Survey IV a household is defined as a group of people who have usually slept in the same dwelling and taken their meals together for at least 9 of the 12 months preceding the interview. All listed persons who have been away from the household for more than three months are not considered to be household members except, (1) the person identified as the head of household even if he has not been with the household for 9 months or more; (2) newly born children; (3) students and seasonal workers who have not been living in or as part of another household[1].

In the **South African** "Baseline Household Statistics" methodological report, the household concept definition was drawn up in such as away as to avoid double counting of individuals who may live in more than one place. Hence, two definitions were used. The first definition was used only in the first section of the questionnaire, i.e. the Household Roster and the second was used for the rest of the questionnaire. The first definition of the household comprised all individuals who: (i) live under this roof or within the same compound/homestead/stand at least 15 days out of the past year; and (ii) when they are together they share food from a common source; (iii) contribute to or share in, a common resource pool. Visitors were excluded from this definition[2].

The second definition of the household only included those members who had lived "under this roof for more than 15 days of the last 30 days". This definition was derived to avoid double-counting of individuals.

The **Brazilian** LSMS survey, 1996-1997, defines **a resident** as a person for whom the dwelling unit is his/her place of habitual residence. The following are also considered as residents of the dwelling unit: the person present on the date of the interview and who does not have another place of habitual residence; the person for whom the dwelling is his/her place of habitual residence but who is temporarily absent on the date of the interview for a period of not more than 12 months, as a result of, for example, boarding at a school[3].

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[1]In full, the Ghana Living Standards Survey includes the following as part of the household: All the persons not present but who normally live, sleep and eat together with the household, i.e. those who are temporarily away for schooling, temporarily left for marriage, vacation, seasonal work, illness, giving birth, military training, prisons etc.

[2]The South Africa Integrated Household Survey is a nationally representative, multi-purpose household survey, which was undertaken in the nine months prior to the country's first democratic elections in April 1994.

[3]The following criteria are applied to define the dwelling in which a person is to be considered a resident when more than one dwelling is occupied by that person. The first criterion found to be applicable will determine the dwelling: (1) the person is considered a resident of the dwelling unit in which that person's family resides; (2) the person is considered a resident at the dwelling unit in which that person spends the major part of the year; (3) the person is considered a resident of the dwelling unit in which that person has resided for the longest period of time.

The **China** Living Standards Survey (CLSS), which consists of one household survey and one community (village) survey, was conducted in Hebei and Liaoning Provinces (Northern and Northeast China) in July 1995 and July 1997, respectively. In this CLSS, household members were defined as "all the people who normally live and eat their meals together in this dwelling". Those who were absent more than nine of the last twelve months were excluded, except for the head of household.

The **India** Survey of Living Conditions in Uttar Pradesh and Bihar, 1997-1998, defines a household as a group of people who normally live and eat their meals together. For the purposes of that survey, "normally" is taken to mean that the person concerned has lived in the household for at least 3 of the past 12 months[4]. People who live in the same dwelling, but do not share food expenses or eat meals together, are not members of the same household. For example, if two brothers, each having his own family, live in the same house but maintain separate food budgets and cooking facilities, they would constitute two separate households. Likewise, people who eat together but do not sleep in the same dwelling are not members of the same household. However, exception to this rule may be made in the case of those persons who normally take their meals together and for all purposes live together, but may sometimes sleep in other places for security reasons (e.g. with livestock, or in shop or other place of business).

For the 1982 **Jamaica** Population Census, the following definition of household was adopted and has been used for all household surveys conducted since: a household consists of one person who lives alone or a group of persons, who, as a unit, jointly occupy the whole or part of a dwelling unit, who have common arrangements for housekeeping, and who generally share at least one meal. The household may be composed of related persons only, of unrelated persons, or of a combination of both. The same definition was adopted for the 1991 Population Census[5].

The first **Moroccan** Living Standards Survey (MLSS) was conducted between October 1990 and October 1991 and provides data for a sample of 3,323 households and 19,577 individuals[6]. The MLSS 1990/91 survey covers all household members, defined to include all those individuals for whom the household is their primary residence, and who are economically dependent on the household. Household members also include: individuals who are not physically present but whose absence has been for less than one month (or in the case of those hospitalized, less than six months), lodgers who share at

[4]The only exceptions to be made to this rule should be for (i) persons who are the main provider for the household, (ii) infants who are less than 3 months old, and (iii) newly weds who have been living together for less than 3 months. Servants, lodgers, farm-workers, and other such individuals who live and take meals with the household are to be counted as household members, even though they may have no blood relation to the household head.

[5]The Jamaica Survey of Living Conditions (JSLC), first conducted in 1988, was originally conceived to be a semi-annual survey. In 1990, an annual survey was deemed to be sufficient and an annual schedule was adopted. Fourteen rounds of the survey were completed from August 1988 to July 2000. The JSLC differs from other LSMS surveys in its relatively narrow focus and greater emphasis on immediate policy impact. The JSLC is linked to the ongoing quarterly Labour Force Survey.

[6]Survey fieldwork began on October 15, 1990, and ended on October 30, 1991. Fieldwork was organized into 10 four-week periods (survey "months"), but there were some breaks during this time so that the survey itself took about 54 weeks to complete.

least one meal with the household, and servants who reside at and share meals with the household.

The first **Vietnam** Living Standards Survey (VLSS) was conducted in 1992-93 by the State Planning Committee (now the Ministry of Planning and Investment), together with the General Statistical Office. The second round of the VLSS was conducted between December 1997 and December 1998[7]. This survey defines the household members as "all people who normally live and eat their meals together in this house and have done so for 6 or more months out of the past year". While this is the same definition as used in 1992-93, there are some differences with respect to specific cases about who to include and who to exclude from the household[8].

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CSO (1996). *Living Conditions Monitoring Survey I 1996*. Enumerator's Instruction Manual.

Deaton, A. (1997). *The analysis of household surveys: a microeconometric approach to development policy*. The Johns Hopkins University Press, Washington, D.C.

[7]The second round of the VLSS used 5 questionnaires: commune, price, school, clinic, and household. The household questionnaire contained 15 sections each of which covered a separate aspect of household activity.

[8]See Table 2.2: Categories of household members and Non-members at: http://www.worldbank.org/html/prdph/lsms/country/vn98/vn98bif.pdf

Focus on the Definition of Agricultural Household in Selected Developing Countries

When constructing statistics for agricultural households in developing countries the primary unit of enumeration is the agricultural holding, which may be briefly defined as a techno-economic unit comprising all land and livestock used for agricultural purposes and operated under a single management, without regard to title or legal form. The national agricultural census should, in principle, cover all holdings in the country. For practical reasons, however, the census enumeration is usually limited to those holdings above prescribed limits of size and do not include land solely used for communal grazing, etc. A holder is defined as a person who exercises management control over the operations of the agricultural holding. Usually there is one holder in an agricultural household, who may or may not be the head of the household. In developing countries, a one-to-one correspondence between a household and a holding is quite usual, but it is certainly not universal. A single agricultural holding can include several agricultural households, and one agricultural household can operate on several agricultural holdings.

When using agricultural census data, one has to remember that in some contexts it is common that the demographic data collected in a census of agriculture refers only to persons attached to agricultural holdings and that there may be no coverage of other persons belonging to the holders' household, and hired workers who either permanently or occasionally work on the holding. Thus, agricultural censuses do not cover all persons associated with agriculture (Stloukal, 1999)[1]. Many of these problems also are faced by surveys of holdings in OECD countries. For example, the EU's Farm Structure Survey shares many of these characteristics.

Responses to the question on the definition of an agricultural household contained in the UNECE survey of agricultural household income statistics in a number of developing countries are shown in Focus Table XIII.12 below. An agricultural household is defined as a household in which at least one member is carrying out some agricultural activity on the holding belonging to the household (excluding the growing of vegetables meant for home consumption). The Table describes the relationship between the holding and the agricultural household for a number of developing countries.

[1] http://www.fao.org/sd/wpdirect/wpan0041.htm

FOCUS TABLE XIII.12
Definition of agricultural household in developing countries

COUNTRY	DEFINITION OF AGRICULTURAL HOUSEHOLD
Brazil	The definition of **holding** matches with the one suggested in the FAO programme for the World Census of Agriculture (WCA) 2000.
China	**Agricultural household:** refers to rural household whose members are either engaged in purely agricultural activities, or in a combination of agricultural and non-agricultural activities.
India	**Operational Holding** (the statistical unit for census) is defined as all land wholly or partly used for agricultural production and operated as one technical unit by one person, alone or with others, without regard to title, legal form, size or location. **Operational Holder** is the person who takes all managerial decisions regarding cultivation of land. He may be the legal owner or a leaser or a tenant firmer.
Jamaica	**Farmers** that possessed a total area of under 25 acres (the definition of small farmer used by ACB).
Morocco	**Agricultural holding** was defined as an economic unit of agricultural production under single management, comprising all livestock kept and all land used for agricultural production purposes, regardless to title or legal form.
Peru	The selected statistical unit is the **Agricultural Unit**, defined as any piece of land consisting of one or more parcels, totally or partially used for agricultural production, carried out as a technical-economic unit by the agricultural holder, without regard to size, tenure or legal status.
South Africa	If the household members are engaged 50% in agriculture and 50% in non-agricultural activities, the category is defined the household's income.
Vietnam	**Agriculture, forestry, fishery households:** are households with all or most of labourers regularly participating, directly or indirectly, in agricultural, forestry or fishery production and these activities are the principal source of their income.
Zambia	**Agricultural Household :** is a household in which at least one members carrying out some agricultural activity on the holding belonging to the household (excluding the growing of vegetables meant for home consumption). Preliminary testing showed that there was almost or to-one relationship between the agricultural household and holding. The terms holding and agricultural household are therefore used interchangeably.

Source: UNECE (2005), *Survey on Agricultural Household Income Statistics.*

Focus on the Classification into Socio-Economic Groups in Developing Countries

The basis of classifying households into socio-professional groups in developing countries is usually the use of their labour. The **China** Living Standards Survey (CLSS), 1995-1997, asked all individuals age thirteen and above to respond to the employment activity questions. The CLSS collected general information on farm and non-farm employment, such as, for example, whether or not the household member worked on a household owned farm in 1994, number of work days and number of hours worked during the busy season, occupation and sector codes of the major, second, and the third non-farm jobs, and the number of days worked on, and total income derived from, these non-farm jobs. Furthermore, detailed information on the major and the second non-farm job is collected.

The **Ghana** Living Standards Survey round four (GLSS 4) 1998/99 was designed to gather information on employment, time use and the different sources of income for household members aged seven years and over[1]. GLSS 4 provided information on the characteristics of main occupation for the previous 12 months by detailing the kind of work or industry a respondent was mainly engaged in.

Individuals in **Jamaica**'s Survey of Living Conditions (JSLC) can be linked to the data from the Jamaican Labor Force Survey. Each member of the household older than 14 years of age is asked questions regarding his or her employment status[2]. In the 1997 JSLC, a module was included to obtain an in-depth picture of earnings in the country. This module was based on the employment and earnings portion of the 1993 Time Use module that was found to be superior in its response rate for earnings data compared to other attempts including the Labour Force Surveys. The information collected included details on the main occupation, allowances received in addition to or as part of salary, income, additional employment, information on the unemployed, and household enterprises.

The **Moroccan** Living Standard Survey, 1990-1991, provided, for example, information on current principal employment for individuals aged seven or more; characteristics of salaried employees; current secondary employment; principal employment in the previous 12 months; salary earnings; and secondary employment in the past 12 months.

The **Peruvian** Living Standards Survey (LSS) asked questions on the economic activity of those six years and older and provides a description and code of occupation and a description and code of establishment[3]. The Peruvian LSS also provides a description

[1]In this survey, main occupation is defined as: the work to which most time is devoted when a respondent has several jobs. For instance, the main occupation for the past 12 months of a respondent who farms mostly but often goes fishing during the dry season is farming.

[2]The Labor Force Survey contains much less detail than the standard LSMS employment and job search modules. Moreover, the Labor Force Survey income data are of dubious quality.

[3]Principal Economic Activity was defined as the activity on which most hours were spent (NOT which provided the most earned income).

and code of secondary occupation at which most hours were spent in last 7 days and a description and code of Establishment.

The **South Africa**'s Integrated Household Survey, 1994, asked questions about what job the household members did and in which sector they were employed. These questions were repeated for a second casual or temporary job.

The **Vietnam** Living Standards Survey asked all individuals age six and older to respond to the economic activity questions. These began with questions on the nature of their work in the last seven days. For work in the last seven days, information was collected on, for example, length of employment, type of employer and money and in kind compensation and benefits. Similar questions were asked of any secondary job in the last seven days. If the main work in the past twelve months was different from the main or secondary job in the past seven days, the complete set of questions was answered for that work as well. For those in self-employed agricultural work, a different series of questions was asked on hours worked in peak and non-peak weeks in the past 12 months for six different agricultural-related work activities. Occupation and industry of employment codes are printed directly in the household questionnaire. In addition, this survey gathered data on household businesses for up to the four most important enterprises operated by the household.

Focus on Equivalence Scales in Developing Countries

As noted in Chapter IX, equivalence scales are designed to account for the varying requirements of families of differing sizes and age compositions, and an extensive literature exists on their conceptual bases and estimation. A feature of developing countries is that nutritional requirements play a far more significant role than among OECD members. The Focus Table XIII.13 below gives basic calorie requirements and calorie equivalence scales.

There are two major approaches to the construction of equivalence scales. The first can be termed the subjective method and is based on personal assessment using survey data. This survey approach attempts to measure a minimum standard of living for alternative family structures. Bishop *et al*. (2004) used the subjective-qualitative method to estimate household equivalence scales for their study of urban Chinese poverty in 1988 and 1995. To avoid the problem that persons in rich regions tend to have higher perceived needs they incorporate objectively determined cost of living indices to adjust for regional differences in purchasing power. Minimum needs thresholds were constructed for seven family types and converted into equivalence scales. They found that a two-person family composed of two adults with the age of the household's head greater than or equal to 60 years old would need 1.54 times as much as a single adult, and three-person family without children would need 1.99 times as much as a single person. Three persons with one child would need a little less, 1.77 times that of a single person. Finally, four or more person households with children (D4+_K) and without children have equivalence factors of 2.00 and 2.38. Bishop *et al*. (2004) went on to construct minimum needs thresholds for four different regions.

The second major approach is to use "expert-based" equivalence scales. Gustafsson *et al* (2004) provide a set of expert based equivalence scales, which they use to measure inequality in Chinese incomes[1].

An interesting observation is drawn from Burgess (2001). In **China** the land equivalence scales for children 0-14 are 0.567 and 0.507 in Sichuan and Jiangsu respectively which are almost directly in line with the calorie equivalence scales, 0.576 and 0.522. This, according to Burgess (2001), serves as preliminary evidence that land is being allocated in line with nutritional needs. If the nutritional hypothesis holds then land allocation should be done mainly on the basis of the number of adult equivalents in a given household as determined by the calorie share method[2].

[1]Gustafsson and Li (2001) indicate that one person = 1.0, two persons = 1.88, three persons = 2.66, four persons = 3.54 and five-plus persons = 5.0.

[2]Calorie based equivalence scales are thus closer to the notion of physiological or nutritional welfare which motivated the earliest work on equivalence scales though the method is not prescriptive and behavioural responses are taken into account.
Based on a 0-4, 5-9, 10-14, 15-55+ age breakdown there are 138 household types in Sichuan and 117 household types in Jiangsu each of which was assigned a unique equivalence scale. A 0001 household containing one adult was set as the numeraire and had a scale equal to unity. Scales calculated for other households are thus interpretable as adult equivalents.

FOCUS TABLE XIII.13
Daily calorific requirements and calorie equivalence scales

AGE	MALE	FEMALE	EQUIVALENCE SCALE
1	820	820	0.273
	1150	1150	0.383
2-3	1350	1350	0.450
3-5	1550	1550	0.517
5-7	1850	1750	0.617
7-10	2100	1800	0.700
10-12	2200	1950	0.733
12-14	2400	2100	0.800
14-16	2650	2150	0.833
16-18	2850	2150	0.950

	Type of work						
	Light	Medium	Heavy	Light	Medium	Heavy	
18-30	2600	3000	3550	2000	2100	2350	1
30-60	2500	2900	3400	2050	2150	2400	0.977
>60	2100	2450	2850	1850	1950	2150	0.845
				+285 if pregnant (last 3 months) +500 if breast-feeding (first 6 months)			

Note: equivalence scales are gained by dividing male calorific requirements by 3000.

Source: WHO (1985), Referred to in Appleton *et al.*, (1999).

FOCUS PIECES

Appleton, S., Emwanu, T., Kagugube, J. & Muwonge, J. (1999). *Changes in Poverty in Uganda, 1992-97*. WPS/99.22**,** 44.

Bishop, J.A., Luo, F. & Xi Pan (2004). *Evaluating Regional Poverty in China with Subjective Equivalence Scales*. Paper prepared for the Eastern Economics Association Conference, Washington, D.C., February 21.

Burgess, R. (2001). *Land and Welfare: Theory and Evidence from China*. Department of Economics and STICERD London School of Economics Houghton Street London WC2 2AE September 14, 2001. http://econ.lse.ac.uk/staff/rburgess/wp/land_and__welfare2.pdf

Gustafsson, B., Shi Li & Hiroshi Sato (2004). *Can A Subjective Poverty Line Be Applied to China? Assessing Poverty among Urban Residents in 1999.* Journal of International Development, 16(8), 1-19, 2004.

Focus on Own Consumption in Developing Countries

Although income and wealth are what enable people to obtain goods and services, it is those goods and services themselves that directly generate economic well-being. The consumption module of the Living Standards Measurement Study survey (LSMS) used in developing countries (see the Handbook's Chapter XIII Core Text) is designed to measure the consumption of these items in some detail and in the aggregate (with the aggregate being the total value of consumption at suitable prices). At its simplest, the module collects data on how much people spend on various goods and services (Deaton and Grosh, 2000).

Past LSMS surveys have used a range of lengths of time to which the questions on consumption relate (recall periods), depending on both the item and the survey. Data on the value of home-produced food are collected in a separate set of questions that ask how often the home-produced food is consumed; the recall period for these questions has varied from country to country in previous surveys, ranging from "each time the home-produced food is consumed" to each day in a typical month (Deaton and Grosh, 2000).

In nearly all LSMS surveys, calculating a comprehensive measure of consumption will require at least some imputations. Not all consumption is obtained through market purchases; if analysts want to calculate consumption in monetary units, they must find some way of pricing its non-marketed components. In many of the poorest countries, and especially for the poorest people, a large share of food comes from home production or from hunting, fishing, or collecting wild foodstuffs. These imputations for food are likely to be those that are most important for the totals (Deaton and Grosh, 2000).

FOCUS TABLE XIII.14
Nutrition (calorie) based adult equivalence scales

AGE (YEARS)	MALE WEIGHT	FEMALE WEIGHT
0	0.33	0.33
1	0.46	0.46
2	0.54	0.54
3-4	0.62	0.62
5-6	0.74	0.70
7-9	0.84	0.72
10-11	0.88	0.78
12-13	0.96	0.84
14-15	1.06	0.86
16-17	1.14	0.86
18-19	1.04	0.80
30-59	1.00	0.82
60+	1.84	0.74

Note: Calculated from World Health Organisation data

Source: Dercon (1998).

It should first be noted that imputation is an inherently difficult and error-ridden process. Imputation is likely to work best where there is relatively little need for it - when the economy is highly monetized but there is a relatively small amount of own-production (such as vegetable gardens) involving goods that have clear market equivalents. Imputation works badly in economies in which a large share of transactions does not pass through the market.

Food that is either home-produced or received as gifts or payment in kind has been the most important imputed item in LSMS surveys to date. In principle, the calculations are straightforward. The respondent is asked to report the values of any home-produced food items consumed by the household during the reference period, and the sum of these values is added to the consumption total. Given the seasonality of production, the recall period probably has to be a year, or at least a typical month over the last year. It may be possible to do better than this when there is a multiple-visit agricultural module in the survey. However, the major difficulties are with valuation, since the respondent is being asked a purely hypothetical question about the sale or purchase of an item that is rarely traded or that may have been traded some time ago (Deaton and Grosh, 2000).

The value of the physical quantities of goods consumed observed by the respondent can be obtained in several ways. As noted in Chapter X, *farm-gate prices* set a lower bound on valuation, since it is usually presumed that consumption is evidence that the good is valued beyond what it would fetch, whereas *market prices*, are likely to be too high because they include transport and distribution margins and because the commodity traded is often of higher quality than its home-grown counterpart. However, once the quantity has been obtained, the respondent could be asked to report one or both of these two prices or simply to estimate the value of the commodity directly. Some degree of cross-checking is possible from the quantities and prices of purchases reported in the agricultural module or from the prices gathered in the community questionnaire (Deaton and Grosh, 2000).

The **China** Living Standards Survey (CLSS), 1995-1997, provides information on household consumption expenditure. The CLSS collects detailed expenditure information on thirty-four items of market purchased food (including expenditure in restaurants) in the previous year. Besides market purchases (including barter), the CLSS gathers information on consumption from home produced food (total thirty-two items) over the previous year.

The **India** Survey of Living Conditions Uttar Pradesh and Bihar, 1997-1998, on food expenses and home production, collects information on the household's total expenditure on food of various types, including an estimate of the value of home produced or home-grown food consumed by the household. It also provides an estimate of food consumed that was received as payment in-kind, i.e. as remuneration for work done on someone else's farm, as gifts, or as presents from relatives and/or friends.

The **Jamaica** Survey of Living Conditions asks the respondent if there was any expenditure in the previous twelve months on 43 categories of food items. For each item that had been purchased in the last year, the amounts spent during the past seven days and the amount spent during the past 30 days/4 weeks was recorded. In 1992 through 2000, the value of home production and gift food was integrated into the food expense

module. Thus the number of items for which this information was collected was expanded from 43 to 55.

In the JSLC surveys from 1988 through 1991, for sixteen food items, the respondent was asked if the household had eaten any food that was home-produced or that was received as a gift. The respondent was asked how much it would cost to buy the amount of home-produced food consumed during the past seven days and the amount consumed during the past 30 days/4 weeks, and the amount it would cost to buy the amount received as gift during the past 30 days/4 weeks. Starting in 1992, the value of home production and gift food was integrated into the food expense module.

The **Moroccan** Living Standards Survey provides information on individual expenditures in the past 30 days; individual expenditures in the past seven days; daily (over four days) expenditures on food and household items; and home production and consumption of food.

The **Peru** Living Standards Survey asks questions such as: Does the household produce any food for business or home use; did the household purchase or use self-produced products in past 15 days; how the food item was obtained (for example, self-supplied); and total amount of purchases or self-production in the past 15 days.

The **South Africa** Integrated Household Survey looks at the patterns of food consumption for all the people in the household. It inquires as to whether any of those foods were received in the form of a gift or as payment for work that any member of the household did. It elicits information about whether the household was able to consume any of the foods listed as a result of its being produced by the household. It also asks the about what crops, if any, the household was harvesting in the past year.

The **Vietnam** Living Standards Survey, 1997-1998, collects detailed information on market purchases and consumption from home production for 45 food items. Thus, besides market purchases (including barter), information is also collected on consumption from home production. Again data is obtained on the number of months each item was consumed, but unlike market purchases, the information on the quantity and value of consumption is obtained by asking a single question on the total amount for the previous 12 months (as opposed to asking how often the item was purchased each month and the quantity purchased each time).

The **Zambia** Living Conditions Monitoring Survey I (1996) asked about how much was spent on and consumed from own produce from a list of food items during the previous two weeks.

FOCUS PIECES

Deaton, A. & Grosh, M. (2000). *Consumption*. In: Grosh, M. & Glewwe, P. (eds.) *Designing Household Survey Questionnaires for Developing Countries. Lessons from 15 years of the Living Standards Measurement Study*. The World Bank, Washington D.C.

Focus on Imputed Rent in Developing Countries

When imputing the value of owned residential property in estimates of income or consumption, the process starts from the rental equivalent. Unlike the value of most other durable goods, rents can sometimes be observed directly, and these are the correct numbers to add into the consumption aggregate. For households that do not report rents, the standard procedure for developing countries is to impute a rent based on the characteristics of the house, as reported in the Living Standards Measurement Study (LSMS) housing module (see the Core Text of Chapter XIII). One approach is through "hedonic" regressions in which reported rent is regressed on the house's characteristics (such as size, number of rooms, construction material, and location) and the results are used to calculate rents for other properties where rents are not reported.

The credibility of these regressions is compromised if only a small fraction of the sample reports rents and, more generally, if those who report rents are unrepresentative of the population as a whole. While it is possible to make mechanical corrections for the selection, these corrections usually require arbitrary and un-testable assumptions that further compromise the credibility of the process. This is a difficult area. In general, survey analysts should make sure that indefensible imputations are not dominating welfare comparisons. The data required for rent imputations are gathered in the LSMS housing module (and to some extent in the community questionnaire) (Deaton and Grosh, 2000).

The **China** Living Standards Survey (CLSS), 1995-1997, contains basic information on housing from all the 880 farm households interviewed and selected from a total of thirty-one sample villages for the household survey. However, no information was collected on housing rent[1].

The **Ghana** Living Standards Survey round four (GLSS 4) 1998/99 seeks information on the type of dwelling, occupancy status, number of rooms and room space, **expenditures**, utilities and amenities as well as the physical characteristics of the dwelling. GLSS 4 seeks information on rent payment(s), either cash or in-kind.

The **Indian** Survey of Living Conditions Uttar Pradesh and Bihar, 1997-1998, on housing and access to facilities, collects information in three areas: the type of dwelling occupied by the household, access to basic services (water, sanitation, and electricity), and access to various facilities providing services. However, no information is collected on rent, despite the fact that certain questions are for renters only.

In **Jamaica**'s Survey of Living Conditions, questions on housing are designed to characterize the type of dwelling occupied by the household and to determine the amount spent on housing, including rent, water, electricity, and other expenses.

[1]Several rounds of pilot surveys for preparing the CLSS questionnaire showed that there are almost no households living in dwellings they do not own. Therefore, in the housing section of the formal questionnaire, there are no questions about house renting activities. To see which method was used to get the house depreciation rate and eventually to obtain the "use value" of dwellings see Appendix D: Household Expenditure Calculation, section 2.3 in:
http://www.worldbank.org/lsms/country/china/docs/chnbinfo.pdf

Expenses include the amount paid for water and electricity. Information on ownership, rent, mortgage and taxes is also collected.

The **Moroccan** Living Standard Survey, 1990-1991, collects information on the status of ownership or rental arrangement; physical characteristics of dwelling; services (water, sewage, etc.); and expenditures on housing.

Peru's National Survey of Households Living Standards Measurement, May - July 1994, provides information on Ownership Status of Dwelling. For example, rented in exchange for in-kind services or money, and asks follow-up questions such as "if rented, from whom rented; if you had to rent, estimated rental value in Soles per month?"

Vietnam's Living Standards Survey, 1997-1998, contains information on the type of dwelling, housing expenses, and housing characteristics for all households interviewed. Information was collected on ownership status and rental cost if rented.

The **Zambia** Living Conditions Monitoring Survey I (1996) asks about the basis upon which the household occupies the dwelling; how the rent is paid; and how much the household pays in rent per month.

FOCUS PIECES

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Focus on the Calculation of Net Disposable Income of Agriculture Households in Developing Countries

As was noted in Chapter X, income and consumption are different but related concepts. Though the focus of this Handbook is the income of agricultural households, the purpose of measuring income is very much linked to the ability that income gives to consume and thus be reflected in the livelihood of the household. Some economists prefer income as a measure of living standards because they follow a "rights" approach. According to this approach, income, together with assets, measures the potential claims on the economy of a person or family. Other economists prefer to use consumption data as these show the level of living by measuring what people acquire.

Another consideration when deciding whether to use income (including income from assets) or consumption is the time period over which living standards are to be measured. There is a good deal of empirical evidence that even people in poor agricultural societies and people without the ability to borrow much can smooth their incomes within a particular year and perhaps over a series of years, so that consumption will reflect living standards at least throughout one year and perhaps over a series of years (for a review see for instance Deaton, 1997, Chapter 4).

Most people do not receive income every day, and many do not receive income every season - or at least not an equal amount every season. So while consumption over a week, two weeks, or a month is likely to be a reasonable indicator of living standards over a year or over a few years, income will not be. If analysts are interested in measuring averages, income variation will not matter much if the survey itself is spread over a year, since some people's zero incomes will balance out others' high seasonal incomes. However, analysts are usually interested not only in means (LSMS surveys are rarely the instrument of choice for estimating mean income or consumption) but also in inequality and poverty, which are sensitive to the tails of the distribution, especially the lower tail. Gathering data on the previous month's income will overestimate inequality in annual living standards and, provided the poverty line is below the mode of the distribution, will overstate the fraction of people below the line. Although there are also random irregularities and seasonal patterns in consumption, they are typically smaller than those in income, because consumption is less tied to seasonal and weather-related patterns in agriculture than is income. Even so, consumption measured over a reference period of less than a year is likely to overstate poverty and inequality. In addition, the overstatement may not be constant over time if seasonal patterns change with time, because one year is different from another - or over the long run, because agriculture accounts for a shrinking share of household income as economies become richer (Deaton and Grosh, 2000).

These arguments provide a persuasive case that, given the choice, (perfectly measured) consumption is a more useful and accurate measure of living standards than is (perfectly measured) income. These theoretical advantages of consumption are likely to decrease as the period over which it is feasible to gather data gets longer. If it is feasible to visit households on many occasions throughout the year this will clearly capture any seasonality in the household's income. Moreover, if the survey has a panel element so that income can be averaged over a series of years, it makes little difference whether

income or consumption is measured, if one can be measured as accurately and as cheaply as the other (Deaton and Grosh, 2000).

The income of many households - particularly but not exclusively agricultural households - varies seasonally throughout the year. In these circumstances, measuring households' annual income (which is the minimum amount of data needed to adequately determine poverty and distribution) would require many visits to the household or reliance on the ability of household respondents to remember their income from many months earlier. However, if consumption is smoothed over the seasons - and much of the literature already cited suggests that this is done in most households - consumption will vary less by season than income does. It may also be possible to collect useful data on annual consumption without making multiple visits (Deaton and Grosh, 2000).

It is generally thought that respondents are more reluctant to share information about their income and (to an even greater degree) their assets than about their consumption. Thus, they are more likely to lie about their income than about their consumption. In many countries income is taxable, at least in principle, and it may be hard for the survey interviewers to persuade respondents that the information they give will not be passed on to tax authorities.

Income from assets is likely to be particularly hard to capture because the ownership of assets is highly unequal, and the wealthy, who own the most assets, are typically thought to be the least likely to cooperate. Given that most of the survey interviews in developing countries must be conducted in a semi-public place, respondents are often reluctant to state their wealth in the presence of relatives and friends. These problems of measuring assets and asset income are likely more severe for measuring inequality than for measuring poverty, since households below the poverty line typically have few assets (Deaton and Grosh, 2000).

The **Ghana** Living Standards Survey round four (GLSS 4) 1998/99 collects data on the household's agricultural activities. It provides data on agricultural production, technology, processing, marketing, income and consumption patterns. The GLSS 4 was also designed to obtain information on income for the household specifically from non-farm enterprises. It identifies which household members are responsible for each non-farm enterprise in terms of decision making and the allocation of income it generates. Non-farm enterprises that are currently operating and those that were operational some time in the past 12 months but currently not operating are considered.

The GLSS 4 1998/99 obtains information on income transfers, that is all incomes of members of the household other than that from paid employment. Transfers to the household are considered as income where as transfers from the household constitute

expenditures, thereby completing the income and expenditure current accounts of the household[1]. Furthermore, the GLSS 4 1998/99 is designed to collect information on loans, assets and savings.

The **India** Survey of Living Conditions Uttar Pradesh and Bihar, 1997-1998, also aims to capture the flow of remittances and transfers into the household.[2]

According to the **Jamaican** Living Standards Measurement Survey, theoretically, all the elements of a household provide the following equation:

> Household income = household consumption expenditure + non-consumption expenditure + savings – net debt (net repayments of principal and interest on debts contracted by the household – net repayments of principal and interest on money lent by the household).

Jamaica's Survey of Living Conditions records the value of all miscellaneous income received by household members during the past twelve months. Income sources include: remittances from relatives or friends that live abroad, rental payments for land or property, social security and other pensions and interest from loans.

The **Moroccan** Living Standards Survey, 1990-1991, asked questions to identify home enterprises.

The **Peruvian** Living Standards Survey, 1994-1995, asks whether the household received non-labor income in the previous 12 months and about the source of other income received. It also inquires as to whether the household took a loan or other source of credit.

The **South Africa** Integrated Household Survey solicits information about income received from absent members of the household or from any other person from the list of people who make contributions to the household. It also talks about any money or any form of assistance that members of the household may have received from sources which do not involve employment of some kind. There are many ways in which the household can receive money without being employed. For example, pension payments, charity, unemployment insurance fund, government disability grants, and other forms like that.

The **Vietnam**'s Living Standards Survey, 1997-1998, collects data on money and goods that come into the household as remittances or from other sources unrelated to employment such as social security, pension, poverty alleviation funds, interest on

[1]Included in these transfers are remittances. Remittances are regular or irregular contributions in terms of money or goods and food made to person(s) living abroad or elsewhere. For example, any money, food or goods sent out or received by the household to/from a household member or relative staying abroad or elsewhere is a remittance.

[2]These do not include payments for work or purchases of goods or services in this section, and do not include transactions, which are clearly loans. Also, transfers between household members are not included. However, payments received from any person not considered to be a household member according to the survey definition are included.

savings or investments, insurance payments, gifts, inheritance, lottery winnings, renting out of equipment or buildings and the sale of vehicles or durable goods.

FOCUS PIECES

Deaton, A. & Grosh, M. (2000). *Consumption*. In: Grosh, M. & Glewwe, P. (eds.) *Designing Household Survey Questionnaires for Developing Countries. Lessons from 15 years of the Living Standards Measurement Study*. The World Bank, Washington D.C.

CHAPTER XIV

INCOME AND WEALTH STATISTICS FOR SELECTED COUNTRIES

This chapter provides illustrations of methodologies currently used to generate statistics on the income and wealth of agricultural households in a range of countries and outlines their main findings. The OECD examples, in alphabetical order, are Australia, Canada, Denmark, Finland, France, Italy, Poland and the United States (US). Various forms of microeconomic data systems are encountered, singly or in combination, including farm accounts surveys, household surveys in which farm families form only one socio-professional group, and taxation records. Some countries have more than one way of producing estimates (for example, Italy has three surveys).

The national results use of a variety of definitions, particularly of what constitutes an agricultural household and how income is measured. These definitions are important to the results obtained. The lack of harmony in methodology between countries is a handicap and demonstrates the potential usefulness of the present Handbook in generating comparable results.

XIV.1 OECD COUNTRIES

For completeness the main findings of Eurostat's Income of the Agricultural Households Sector (IAHS) statistics are also given. These contain income estimates for all EU-15 Member States (other than the United Kingdom) and were published from the early 1990 to the 2001 Report, after which the IAHS statistics were suspended. These results stand out as coming from, in principle, an approach that started the estimation procedure not from microeconomic sources (surveys, registers etc.), used by all the others results reported here, but from national accounts aggregates which were already harmonised across Member States. Despite some attractive features, this approach proved not to be successful in practice. Though a harmonised set of definitions was

employed, in reality countries used a mixture of macro-, micro- and hybrid methodologies to generate results, a characteristic that undermined comparability and which contributed to the suspension of Eurostat's IAHS statistics in 2002.

Some common features can be found in the results from the eight selected OECD countries described in the sections below that transcend methodological disparities and which are of importance in understanding the economic position of households that operate farms as entrepreneurs[1]. These features include the following:

- Measuring the income from farming alone substantially understates the overall income that many agricultural households receive, so judging their economic situation only on the basis of agricultural income will overstate the problem of low incomes and associated poverty.
- The stability of total household income over time is greater than that from farming alone, so judging the instability problem will be overstated if only farm income is considered.
- Consumption spending is more stable over time than income, suggesting that farm households save and dis-save to cushion income variations. This is compatible with the permanent income hypothesis in which consumption is sensitive to long-term income prospects and relatively insensitive to short-term movements.
- The distribution of incomes among farm household in OECD countries is generally made less unequal when total income is considered rather than the income from farming alone.
- In many (but not all) OECD countries the disposable income of farm-operator households compare favourably with the all-household national average, suggesting that farmers and their families as a group do not form a particularly disadvantaged group in society. The position is somewhat eroded when incomes are measured per household member or per consumer unit.
- Relative income positions cannot be assessed satisfactorily using data for single years because of the instability seen in the disposable incomes of agricultural households. Medians should be used as well as averages because of the unequal distributions observed.
- Wealth and income are linked, especially in agriculture where land prices reflect *inter alia* the profitability of farming. In the few OECD countries where wealth statistics are available, farm households are typically more wealthy (and substantially so) than the rest of the population. While some agricultural households have both low income and low wealth, far commoner situations are where low income is found combined with high wealth, or where both wealth and income are large.

[1]These finding relate to households that operate farms through *entrepreneurial* activity. They do not necessarily apply to households whose members assist as *employees* in the operation of large-scale farms found in some countries (such as some in Central and Eastern Europe), even though such households may be considered by national policymakers and statisticians to be agricultural. See Chapter X for a discussion.

The findings on the relative income and wealth positions of farm households have implications for countries (including Member States of the EU) that have policies aimed at ensuring a fair standard of living for the agricultural community.

It is worth noting that multiple income sources are found not only in OECD countries but also in developing ones across the spectrum of economies found there. In developing countries access to credit is a key factor in allowing consumption to depart from income.

The remainder of this section of the chapter is taken up by reporting statistics for individual OECD countries. The nature of the material means that each country (and the Eurostat IAHS project) is best treated as a stand-alone section, each with its own set of references. Here only a brief indication of some of the key points for each country is given, and readers are encouraged to pursue the various country sections via the links provided.

XIV.2 AUSTRALIA

The Australia's Bureau of Statistics publishes results based on the Survey of Income and Housing Costs. In Australia in 2001, households that contained at least one person whose main income came from agriculture had a mean income of about 90% of those households where no person was employed in agriculture. However, average incomes varied widely depending on the degree to which income from agriculture contributed to the total income of the agricultural household.

Focus on Income and Wealth Statistics for Australia

XIV.3 CANADA

Within Statistics Canada, the division responsible for generating statistical data from the income tax records of individuals (the Small Area and Administrative Data Division (SAADD)) assembles a "family file" (for families as defined above) using the information on the individual income tax records that indicate the Social Insurance Number of the spouse and the number of dependent children. For the total income of "farming families", the detailed information on farm revenues by item and farm expenses by item from the farm taxation record is linked, via the Social Insurance Number of the operator, to the SAADD "family file".

On average, farm families received 26.5% of their total income from farming activities and 73.5% from off-farm income. Wages and salaries and non-farm self-employment income taken together accounted for 67% of total off-farm income. Pension income represented 12.6% and investment income 10.5%. In a breakdown of unincorporated Canadian farms into those that were business-focused and those that were non-business-focused (or "lifestyle") farms, average total family income varied greatly across these different farm typology groups, from about $16,500 for the families associated with large unincorporated farms that are low-income non-business-oriented farms to $117,600 for families associated with unincorporated very large business-focused farms. The contribution from off-farm income also varied considerably - from 32% for families associated with unincorporated very large business-focused farms to 102% for

families operating farms classified as medium-sized lifestyle farms. In the latter case, off-farm income is thus used not only for the totality of the families' living but also the operation of a small hobby farm holding.

In addition to income, increases in wealth have to be considered. In the period 1996-2000, average total income per farm family operating an unincorporated farm increased by almost 17%. In the same period, equity in the agriculture sector increased by almost 16%. For the period 1995-2003, the increase amounted to 30.5%.

Focus on Income and Wealth Statistics for Canada

XIV.4 DENMARK – REGISTER BASED AGRICULTURAL INCOME STATISTICS

For many years, Statistics Denmark has compiled agricultural household income statistics. This has been partly to supply Eurostat with results for its Income of the Agricultural Households Sector (IAHS) statistics and partly to provide domestic information. A main objective for IAHS statistics was to compare agricultural household income with the income of other socio-professional households; with the suspension of IAHS statistics in 2002 no further comparisons appear to have been made. For national purpose the main objective for the statistics has been to show differences between different types of farming.

The household income statistics are based on a combination of registers of persons, households, income and agricultural holdings. The income register is basically information from tax authorities, which provide Statistics Denmark with data on different kinds of income of all relevant inhabitants. Furthermore, there is information on tax, interest and social contributions. Information on disposable income can be calculated from these data. The income register contains information on the kind of economic activity undertaken by the individual, for example, whether the individual is an employer (broken down by line of business) or an employee. The household register records information on individuals belonging to a household unit. From these data the number of households and the number of consumer units (CU) can be calculated. The agricultural register is the Farm Structure Survey (FSS) register. This contains the annual sample of approximately 50,000 farms in Denmark that have more than five hectares of land or are of similar economic size in terms of production. The register includes, for example, information on the type of farming, standard labour hours, farm location and the age of the farmer. As a result, several subgroups can be delineated. Almost all farms in the FSS (more than 98%) are associated with an individual owner who has a Danish ID-number. It is the presence of this ID-number that facilitates linkage to the other registers. Using the sample to represent the whole population of farm holdings, a specific income statistic on farmers can be compiled. Denmark also has information on wealth and capital gains of its farmers.

When interpreting income results, readers should be aware that interest payments in Denmark represent a uniquely large share of the cost faced by farmers among the Member States of the EU. This is linked to the way in which agricultural assets are transferred between generations that, typically, involve sales from parents to children.

In order to support the high interest burden that results from the credit taken to purchase these assets by family successors there is a tendency for the spouses of Danish farmers, and frequently the farmers also, to work full-time or part-time outside agriculture, particularly in the early years of succession. This in turn has some impact on the choice of farming enterprise, since some forms of production (such as cereals) are more compatible with part-time activity than others (such as dairying). The high burden of interest payments (which often leads to negative profits from the farm business) and the treatment of interest in the taxation system of Denmark means that there is an emphasis on measuring income *before* interest charges. It also means that when households are classified according to their main income source (which, for farming, would normally be after deducting interest charges associated with the business), numbers of agricultural households appear to be disproportionately small..

Bearing this in mind, looking at the bottom line, the farmers' net disposable income (202,000 DKK per household in 2002) was among the lowest of all the other socio-professional groups. This is particularly important in light of the fact that farm households had the highest consumer units per household. Looking at the composition of income, it can be seen that households with employers as the main person providing income still have a relatively high income from wages and salaries. This suggests that the spouse of the employer often works for wages outside of the family business. Furthermore, the figures show that, amongst all employers and own-account workers, farmers have the highest level of interest payments. This indicates that debts (probably related to high capital input) are very high for farm households.

Focus on Income and Wealth Statistics for Denmark

XIV.5 FINLAND

Finland is perhaps the best-equipped EU country in terms of statistics on agricultural household incomes that include comparisons with other socio-professional groups. Its Income Distribution Statistics (IDS) are based largely but not exclusively on taxation information, and are linked to other registers. The total sample is some 10 000 households, of which about 700 turn out to be agricultural households. The public-access database allows the use of several measures of household income and a range of socio-professional groups, classified by the main income source of the household reference person; self-employed in agriculture is one such group. Results are available annually for the period 1990 to 2008; for simplicity consideration here is restricted to the period 2002 to 2008, the earlier results having been included in Eurostat's IAHS statistics.

Important in the present context is that results are given both per household and per consumer unit (CU), and both **means** and **medians** are calculated, thus meeting one of the issues raised by Defra about drawing comparisons.

Results show that Agricultural households have disposable incomes **per household** substantially **above the all-households average**. Their disposable incomes **per CU** is also above the all-households average, though by a smaller margin (depending on the

year, averages were +2% to +24%, and medians +4% to +26% (with neither consistently the higher), but for the period as a whole the general level of elevation was closely similar (+14% for means and +15% for medians). In no year was the average or median disposable income per CU of agricultural households below the all-households position. When compared with households headed by other types of self-employed person (a grouping which would include other types of businesses and some professionals), agricultural households had the lower incomes though the margin was often small or non-existent when median income per CU were compared.

Focus on Income and Wealth Statistics for Finland

XIV.6 FRANCE

In France statistics on the incomes of agricultural households, including comparisons with other socio-professional groups, are published on a periodic basis, the latest available information relating to 2003. Judged by past performance, results for 2009 should be available by about 2013. Figures are published by INSEE/SCEES that show disposable incomes of farmer households and the all-households position and permit comparisons to be made per household or per Consumer Unit (CU); the latter is interpreted in France as a 'standard of living' measure. Both **means** and **medians** can be the basis of comparison, as can distributions.

The approach to obtaining data consists of merging information from the EU labour survey, household income tax declarations and the French component of the EU's farm accounts survey (FADN). The labour survey provides household details (the self-declared occupation of individuals, family composition) that are useful in estimating social security benefits (missing in the tax register) and providing the basis of weighting. The tax register can be used to identify all (dwelling) households that have some income from agricultural self-employment. But the forms of special agricultural taxation applied in France, particularly the existence of lump sum payments for many holdings, means that this is not a suitable source for data on actual incomes. Instead, a merging of information from the FADN database and household income tax declarations is undertaken. This was done for 1991, 1997 and 2003. The statistical burden of bringing the several data source together is too heavy for this merging to be done each year. The next operation was scheduled for 2009.

Using the SCEES figures for 2003 and 1997, on the basis of income per household, French farmers in 2003 had **disposable incomes above the all-household figure**, rather more (15% higher) when medians were compared than with means (5%). This represented a deterioration from the position in 1997, when on both criteria farmer household were about one quarter higher than the national average. Taking incomes per CU eroded the relative position of farmers because of their somewhat larger average size of household. **On this basis farmer households were below the all-households position, at least in 2003**; in that year the disposable income per CU of farmer households was 10% (median) or 15% (mean) lower than that of the general population. However, the volatility of incomes from farming suggests that not too much weight should be attached to movements between individual years. Distributional information for 2003 suggested that when income is expressed per household, farmers

were more numerous than the overall population among the higher levels of income, but on the basis of income per CU farmers were proportionally more numerous than the general population at the bottom of the distribution of living standards: 38% of farmers had a disposable income per CU less than the minimum wage (SMIC=1) against a quarter of all individuals.

Focus on Income and Wealth Statistics for France

XIV.7 IRELAND

Periodic information on the income of agricultural households in Ireland comes from its Household Budget Survey (HBS) which uses a link to the National Farms Survey (the farm accounts survey that contributes to the EU's FADN/RICA) to improve the reliability of data on the income from agriculture. Results from the 1987 HBS, sent to Eurostat as part of its Income of the Agricultural Household Sector project, showed that, as might be expected, the numbers of households and their incomes levels and compositions are sensitive to whether a narrow or broad approach to the definition of an agricultural household is taken. Clearly a broad approach includes many households whose farming is not their main economic activity. Perhaps less expected is the finding that alternative ways of defining in a narrower way can be critical to the results; taking an agricultural household as one where the main income of the entire household comes from farming results in smaller numbers than taking the main income of the head of household (or reference person. If the criterion is the main occupation of the reference person not only do household numbers expand further, but the average income becomes substantially lower.

Results are now available from the 2004/05 HBS, though these are not necessarily comparable with the 1987 figures sent to Eurostat as the HBS uses the 'main occupation' classification system. A breakdown is offered by location, and rural households are further divided into farm and other households, the sample of the latter being about eight times larger than the former when weighted. According to these results, farm households achieved an average level of weekly disposable income that was 95% of the all-Ireland average, somewhat below that of urban households but marginally above that of other rural households. It is worth noting that the gross income of farm households was below that of other rural households, but their taxation was lower. Farmers had a substantial shortfall in their direct income compared with other rural households (€68 per household) but €23 more state transfers (of which the main component was 'farm assist').

Link to Focus on Income and Wealth Statistics for Ireland

XIV.8 ITALY

This section on income and wealth statistics for Italy covers four sources: the **RICA-REA survey,** the Italian component of the European Farm Accountancy Data Network (FADN/RICA) integrated with the Business Survey on farms, by INEA and ISTAT; the two

Italian surveys on household income, wealth and living conditions (**EU-SILC** by ISTAT and **SHIW** by Bank of Italy) that include agricultural cases; and the 1996 survey by **ISMEA** specifically directed at agricultural households, as an example of the Living Standards Measurement Study (LSMS) approach for Italy.

The **RICA-REA** is the farm business survey in Italy that investigates the economic results of farms and the off-farm income of agricultural households holding units[2]. Two components are included in RICA-REA survey. The REA component, managed by ISTAT, includes a set of variables for all farms based on European National Accounts (ESA 95) definitions. The RICA component, managed by the National Institute for Agricultural Economics (Inea), gathers accountancy data from farms over a minimum economic size[3]. RICA/FADN has been implemented in all EU countries since the 1960s and the data are collected annually and collated at the regional level. The published estimates from the survey for the agricultural industry (Division A.01 - *Crop and animal production, hunting and related service activities*, ISIC Rev. 4 classification[4]) and for average farms and agricultural households are available in several publications and on websites of both institutions.

The EU Statistics on Income and Living Conditions (**EU-SILC**) survey is implemented in all EU countries as well as for Turkey, Switzerland, Estonia, Norway and Iceland. The annual survey is the main source of comparable cross-sectional and longitudinal microdata on income, poverty, social exclusion and living conditions. The survey was driven by a multidimensional approach to poverty, with a main focus on aspects of material deprivation. Some data are collected at household level, for example housing conditions, while labour, education, income and sector of activities are available at individual level. In Italy EU-SILC has been carried out since 2004 by ISTAT and is designed to produce indicators at national and regional level on income distribution, inequality and relative poverty. Furthermore, estimates on gross income are available to produce the main socio-economic indicators before taxes and social transfers.

The **Survey of Household Income and Wealth (SHIW),** carried out since the 1960s by the Bank of Italy, was originally designed to gather data on incomes and savings of Italian households. Over the years, the list of variables was extended to include information on wealth (both real and financial assets) and household financial behaviour such as, for example, payment methods. Among the socio-professional groups, a study has been done on households that satisfy the so-called "broad" definition of agricultural household, that is the group that derives part of income from *independent activity in agriculture*. This component can arise from activity of the head of household or any other member (see Chapter IX of this Handbook for a fuller discussion of the definition of the agricultural household-firm and typologies of farm households used by Eurostat).

The survey for the Institute for Services in Agriculture and Agro-food Markets (**ISMEA**), undertaken in 1996, was designed in collaboration with the *Microsimulation-Unit* of the

[2] www.rica.inea.it/public/it/index.php, www.ISTAT.it/strumenti/rispondenti/indagini/rea

[3] http://ec.europa.eu/agriculture/rica/methodology1_en.cfm

[4] http://unstats.un.org/unsd/cr/registry/isic-4.asp

University of Verona to build an agri-food Input/Output (I/O) table for Italy[5]. The survey, beside data on production practices and resources use in agriculture, provided information to model farm-household behavior. In addition, the data supplied relevant information to policymakers (at the regional and national levels) and agricultural organizations for designing and evaluating policies and programmes that affect the farm sector or farm families. The results indicate that farm households are better off than the Italian average household on all variables, with the largest difference being in the wealth category. Furthermore farm households appear to be better off even than the Italian self-employed group for some years of the study period (and for wealth they are better off in every year). An additional characteristic of the farm households is that they have a higher variability than in the rest of the household groups for all the variables.

The surveys of households by the Bank of Italy have established the relative position of farm household in terms not only of income, but also of consumption expenditure and wealth. It is evident that farm households (presumably classified according to the main income of the head of household) in the years covered (1995-2002) had **incomes, expenditures and wealth greater than the all-households average,** and at levels similar to those headed by other self-employed people (greater in the case of wealth). When equivalence scales were applied (to account for household size and composition and express variables per adult equivalent) farm households were **still above the national average** in most of the years covered. The greater variability over time among farm households should be noted. The smaller relative margin using **expenditure** is not unexpected, given the ability of farm households to produce for own-consumption.

Focus on Income and Wealth Statistics for Italy

XIV.9 POLAND

In Poland the EU-Statistics on Incomes and Living Conditions (SILC) (see Chapter XIII) project publishes comparisons of the income of households whose main source is from operating a private farm (self-employment in agriculture) with other socio-professional groups and the all-households average. It should be noted that this relates to the income of the whole household and not that of a reference person (as used in some other sources).

Substantial caution must be exercised with respect to the figures for farming households. Though there are about 2000 cases (in 2005), data are collected by face-to-face interviews, not by a survey of accounts or from tax or other registers (Poland's farmers are not taxed on accounted income). As noted elsewhere in this Handbook, self-employment income data are notoriously difficult to collect in face-to-face surveys; evidence from the French SILC suggests and under-reporting of about 20% and more in developing coutries (see Chapter XIII). That said, in 2007 and 2008 farmer households in Poland had average disposable incomes per household that were 59% and 66% respectively of the all-households average, and incomes per CU 65% and 73% of the all-households figure.

[5] www.ismea.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/1367

Another source of information is the Poland Household Budget Survey, though again the likelihood of under-reporting must be borne in mind. In this source household are required to keep a diary of income and expenditure for a month, and for farmers this includes transactions related to their private farm. Estimates of disposable incomes have now appeared from the 2009 HBS. This shows that farmer households (defined in the same way as in the SILC) have average incomes below those of society in general, but by a smaller margin than found in the SILC (per head and per CU). Farmers are in a lower relative position when medians were used for the comparison (some 29% below compared with 20% below when using means), presumably reflecting the numerical dominance of very small farms in the agricultural structure of Poland.

Focus on Income and Wealth Statistics for Poland

XIV.10 SWEDEN –ANOTHER EXAMPLE OF REGISTER-BASED STATISTICS

Sweden provides another example of how registers can be used for calculating agriculture household income. Data are extracted from the following three registers:

- **The Farm Register (LBR)** which changed somewhat in 2000, resulting in a slight reduction in the number of operators per farm and a sharp reduction in the number of old operators.

- **The Register of Total Income Statistics (IoT)**, which contains information for the whole Swedish population, with unique personal identifiers, about income, deductions, taxes and social transfers.

- **The Register of the Total Population (RTB)**. As of 1999, the household concept was changed for the calculation of IAHS. Previously, only the operators and the spouse were included. In the new concept a maximum of two generations are included provided they are related to each other and are registered at the same address[6].

Results quoted here are what was supplied to Eurostat as part of its Income of the Agricultural Households Sector statistics, which was suspended in 2002. Later results are known to have been calculated by Statistics Sweden and sent to Eurostat (the latest being for reference year 2006). Nationally published results for the total income of farm households do not contain comparisons with other socio-professional groups or the all-households average

In 2002, the average agriculture household income[7], before transfers, amounted to about 314,000 SEK, of which net income from self-employment (including interest adjustment for the self-employed) amounted to 23%. This share was only slightly above

[6]There is no information about couples living together but not having common children. This results in an overestimation of single person households.

[7]Editor – the coverage of households in this paragraph is not clear, though it appears to correspond to the farms register.

the corresponding share in 2000 when a new family concept was adopted. Average net disposable income for agricultural households amounted to just over 90% of average net disposable income for all households. Its share rose, however, by about three percentage points in the period 1999-2000.

Focus on Income and Wealth Statistics for Sweden

XIV.11 UNITED STATES

The Agricultural Resource Management Survey (ARMS) is the basis of supports the US Department of Agriculture's estimates of household income and wealth, and is used in a variety of applied farm production, management, technology adoption, resource use, and household well-being research applications. While the ARMS became a stand-alone survey beginning with the 1996 calendar year survey, it retained and built upon features of survey activities that date to the 1970s. The survey is personally enumerated over several months (from July to April) using multiple survey forms. The ARMS uses a modular questionnaire design. All but a few modules are oriented toward collecting information needed to implement sector-household income links. Remaining modules collect information required to estimate business and household wealth, to measure household labour allocation and sources of off-farm income, to classify farms and households by structure and demographic attribute, and to support analyses of performance and well-being.

The main findings of the analysis using ARMS and other data are:

- Farm households are no different from other households in being pluriactive, pursuing multiple careers and diversifying earnings.
- The farm business as a source of income has become increasingly less important to farm households, especially among farms with sales of less than $250,000 per year, which make up over 90% of all US farms.
- For most non-farm proprietorship households, the business is the main source of income; in contrast, for most farm proprietorship households, the farm detracts from total household income.
- While farm income exhibits considerable variability, farm **household** income is more stable.
- The average wealth of farm households has increased, and farm households have broadened their investment portfolio to include more non-farm components.
- While the life cycle is a dominant influence on differences in the level and source of household income and wealth, other contributing factors include farm type and size, operator education, farm tenure, and household size.
- Average incomes are similar for farm and non-farm households, but farm household income is more dispersed.
- Farm household wealth is considerably greater on average than non-farm household wealth, and is less dispersed.

- The conventional wisdom that farm households are financially disadvantaged compared with other United States households does not hold.

On average, farm households have higher incomes, greater wealth, and lower consumption expenditures than all United States households. Incomes of farm households are, on average, sufficient to support a standard of living (defined as meeting consumption and basic household needs) that either is comparable to or exceeds that for all United States households. No longer do farm households inhabit one all-defining group that is considered either disadvantaged or without problems.

Focus on Income and Wealth Statistics for United States

XIV.12 EUROPEAN UNION: SECTOR-LEVEL ESTIMATES BASED IN NATIONAL ACCOUNTS

In the late 1980s Eurostat set up a methodology for estimating the income of agricultural households, taking national accounts as the primary source rather than on microeconomic data from surveys or registers. Initially known as Total Income of Agricultural Households (TIAH) they were renamed Income from Agriculture Household Sector (IAHS) statistics. Though these statistics were suspended in 2002 for a mix of reasons that included lack of progress among some Member States, questions about the consistency of results between countries, and the recognition that a microeconomic approach held greater promise both for consistency and the ability to service policy needs, it is worth noting the main results.

1. The number of agricultural households (those where the main income of the reference person came from farming) was substantially smaller than the number of households where there was **some** income from farming, and generally smaller than the number of agricultural holdings.
2. Where data existed over time, absolute numbers of agricultural households had been falling, in some instances very rapidly. The fact that results did not relate to a constant set of households must be borne in mind when interpreting changes in incomes per household over time.
3. Agricultural households (defined as above) in all EU-15 countries were recipients of substantial amounts of income from outside agriculture. Though typically about a half to two thirds of the total came from farming, there were large differences between Member States and some differences between years.
4. The total income of agricultural households was more stable than their income from farming alone. Non-agricultural income (taken together) was less variable from year to year than was farming income. Disposable income seemed to be less stable than total income, but the relationship between the two depended on a variety of factors, including the way that taxation is levied.
5. Agricultural households had average disposable incomes per household that were typically similar to, or higher than, the all-household average, although the relative position was eroded or reversed when income per household member or per consumer unit was examined.

6. On average, households with an agricultural holding but where farming was **not** the main income source of the reference person appeared to derive little income from farming; their average disposable income could be greater or smaller than incomes of agricultural households, depending on the country in question.

Focus on Income and Wealth Statistics for European Union

XIV.13 DEVELOPING COUNTRIES

In most developing countries the sources of data on income and wealth for households in general are more limited, since the coverage of administrative systems, especially those concerned with tax collection, are limited. This presents a particular problem in the compilation of data on income and wealth of households dependent on agricultural activities for their subsistence, and on those living in rural areas generally. In most developing countries the majority of rural households operate largely in the informal sector; they have smallholdings, may well hold land under traditional forms of tenure and often do not keep written records of their activities or file tax returns. As described in Chapter XI, therefore, the main source of data on income and wealth are different kinds of household survey, often using diaries and/or respondent recall to collect data on income and expenditure. In many countries, aggregate consumption over specified reference periods is used to estimate income.

Focus on Income and Wealth Statistics for Developing Countries

FOCUS PIECES – CHAPTER XIV

OECD (2003) Farm Household Income: Issues and Policy Responses, ISBN: 92-64-09965-4. Available on www.oecd.org/agr/policy

OECD (2005) *Policy Brief: Farm Household Income: Towards Better Informed Policies*

Eurostat (2002) *Income of the Agricultural Household Sector 2001 Report.* Theme 5. Eurostat, Luxembourg. ISBN 92-894-4471-1.

Focus on Income and Wealth Statistics for Australia

In Australia in 2001, households that contained at least one person whose main income came from agriculture had a mean income of about 90% of those households where no person was employed in agriculture (see Focus Table XIV.1 and Focus Figure XIV.1). However, average incomes varied widely depending on the degree to which income from agriculture contributed to the total income of the agricultural household. If income from agriculture contributed less than one-quarter of total income the mean income of the agricultural household was only 87% of that of non-farm households. Where income from agriculture constituted between one-quarter and one-half of total income then the total income of the agricultural household jumped to 114% of non-agriculture households. If agriculture income accounted for between one-half and three-quarters of total income the agricultural household income dropped to 97% of non-agricultural households. Where more than three-quarters of income came from agriculture the income fell to 76% of the non-farm income.

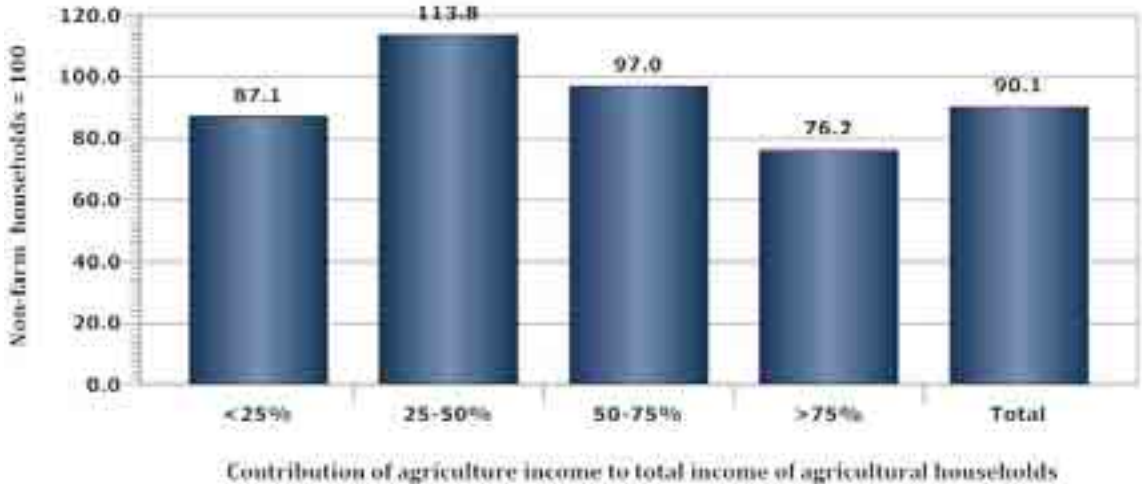
FOCUS TABLE XIV.1
Income for agricultural and other households in Australia, by contribution of agricultural income to total income in 2001, $A

	Estimated number of households	Sample count of households	Mean agricultural income (a) ($A per week)	RSE of mean agricultural income (%)	Mean total income ($A per week)	RSE of mean total income (%)	Agric. Income as % of total income
Household contains at least 1 person whose main job is the agricultural industry, where the contribution of agricultural income to total income is:							
Less than 25%	88,704	75	**77**	48.8	**849**	18.9	9.0
25% to less than 50%	40,415	35	**424**	9.7	**1110**	9.2	38.2
50% to less than 75%	58,635	52	**594**	15.5	**945**	14.5	62.8
75% or more	78,201	77	**673**	13.2	**743**	13.2	90.5
Total	265,955	239	**419**	10.1	**879**	8.0	47.7
Household contains no person employed in the agricultural industry	7,048,965	6,547			**975**	0.9	
Total	7,314,920	6,786	**15**	12.2	**972**	1.0	

(a) Income from wages and salaries from main job plus own unincorporated business income where industry of main job is agriculture

Source: *Australia Bureau of Statistics, Survey of income and housing costs,2000-01.*

FOCUS FIGURE XIV.1
Income of agriculture households compared to non-agriculture households (=100) for different level of contribution of income from agriculture, 2001



Source: *Australia Bureau of Statistics, Survey of income and housing costs, 2000-01.*

Focus on Income and Wealth Statistics for Canada

(i) Gross and net revenues per farm – medium-sized farms have the highest operating margin

In 1996, almost half of all farms in Canada (234,390) reported net cash operating revenue of less than $10,000 and half of these reported losses[1]. Focus Table XIV.2 and Focus Figure XIV.2 show the distribution of the number of farms, gross farm revenues and net cash operating revenue by size class of gross revenue in 1996 and 2001. It is interesting to note that while farms in the gross revenue class of $10,000-$49,999 increased their average net operating income from $1,541 to $2,297, an increase of 49%, farms in all the other revenue classes saw their income increase only by between 1% and 3.1%.

In 2001, farms with gross revenues of $500,000 or more, which made up 6.5% of all farms, accounted for almost 51% of aggregate gross revenues but for only 37% of aggregate net cash operating revenue. It is also interesting to note that their operating margin is lower than farms in all other gross revenue classes, except for that of the $10,000-$49,999 class. In fact, the highest operating margin, whether measured before or after capital cost allowance, is found among medium sized farms, that is those with gross revenues of $100,000-$249,999.

(ii) Farm operators' off-farm income exceeds net cash farm operating revenue

In the period 1993-2001, average net cash operating revenue from the farm and average off-farm income per operator have steadily increased (see Focus Table XIV.3 and Focus Figure XIV.3). Between 1993 and 1999, off-farm income for operators increased its share from 52% of total operator income (before capital cost allowance) to 58%. By 2001, however, it had dropped to just below 55%. While average off-farm income rose by almost 48%, average net cash farm operating revenue increased by only 34%, indicating that operators of farms with over $10,000 in gross revenue are getting increasingly dependent on off-farm income opportunities for their living.

Wages and salaries are the most important source of off-farm income

Wages and salaries are the most important source of off-farm income. In 2001, they accounted for 31% of total operator income (before capital cost allowance) and 56% of off-farm income. Wages and salaries are followed by investment income and pension income at 9% and 8% of total operator income (16% and 14.5% of off-farm income), respectively (see Focus Table XIV.4 and Focus Figure XIV.4).

[1] "Farms", as published in Statistics Canada (1998) *Economic Overview of Farm Incomes: All Farms, 1996* (Ottawa: Statistics Canada, Catalogue no. 21-005) (www.statcan.ca:8096/bsolc/english/bsolc?catno=21-005-X&CHROPG=1) refers to unincorporated farms with gross revenues of $10,000 or more plus incorporated farms with gross revenues of $25,000 or more (if 51% of more of their sales are generated by agricultural activities) plus communal farming operations such as Hutterite colonies.

Off-farm income as a share of total operator income (before capital cost allowance) is smaller for operators of larger farms

In general, off-farm income as a share of total operator income (before depreciation) is smaller for operators of larger farms. Operators of the smallest farms tend to use off-farm income to cover losses from the farm or, equally likely, operators of the smallest farms began with an off-farm job and have started a small hobby farm on the side. In 2001, off-farm income represented about 94% of total operator income (before capital cost allowance) for operators of small farms with gross revenues of $10,000 to $49,999, compared with about 33% for the operators of the largest farms (see Focus Table XIV.5).

The highest dollar amount from wages and salaries was earned by operators of very large farms followed by the smallest farms

The highest dollar amount from wages and salaries (about $24,600 in 2001, or about 63% of their reported total off-farm income) was earned by operators of larger farms (see Focus Table XIV.3 and Figure XIV.3). This may be attributed to the fact that many farms in this size class are likely to be incorporated farms. Operators of incorporated farms receive the income from their farms in the form of wages and salaries or as dividends. The wage and salary expense reduces net operating revenue of the farm enterprise, while the wage and salary income increases the reported off-farm income of the farm operator. Note also the high amount of investment income (which includes the dividends paid by the corporate farm) received by operators of larger farms.

Operators of the smallest farms also receive a large amount in wages and salaries – about $17,400, or 57% of their total off-farm income. The lowest average earned level of wages and salaries was recorded by operators of farms with gross revenues of $100,000 to $249,999 - about $8,200, or 48% of their total off-farm income. The farmers in this category spend relatively more effort on their farms than other categories, which, as was seen above, also results in the highest operating margin[2].

Investment income as a percentage of total off-farm income tend to increase by revenue size – for pension income it is the reverse

Investment income as a percentage of total off-farm income tends to be higher for operators of larger farms - 12% for the smallest category rising to 22% for operators of farms with revenues of $500,000 or more (see Focus Figure XIV.4). As noted above, investment income of operators of larger farms would be expected to be higher, in part due to the dividends flowing from an incorporated farm to the operator. For pension income it is the reverse. For the largest farms, pension income represents only 5% of total off-farm income while it constitutes as much as 19% for the operators in the smallest farm category.

Non-farm self-employment income is fairly stable at between 5% to 7% of total income for operators in all farm categories.

[2]Note that the operating margins reported here are gross revenues minus cash expenses, including the wages paid to the operator and other family members. If these wages were classified as income, rather than an expense, then the calculated margins of the larger farms would be expected to be higher.

(iii) Total farm family income increases steadily as a result of increasing off-farm income

Between 1996 and 2000, the total number of families associated with unincorporated farms (with gross revenue of $10,000 or more) declined continuously by almost 9% to just below 148,000 (see Focus Table XIV.4). In the same period, the average operating income per farm family fell by 0.4% while the average off-farm income surged by over 24%. This resulted in an increase of average total income per farm family of almost 17%, reaching about $66,300 ($54,500 after deduction for capital costs). The share of total income represented by off-farm income rose from 69% in 1996 to 73.5% in 2000.

Increased payments from farm aid programs, as well as higher livestock and product revenues as a result of strong demand, limited the losses in average net farm operating income. The rise in average off-farm income was largely driven by a surge in labour income.

Off-farm income exceeds 70% of total family income

On average, farm families received 26.5% of their total income from farming activities and 73.5% from off-farm income. Wages and salaries and non-farm self-employment income taken together accounted for 67% of total off-farm income (see Focus Table XIV.5). Pension income represented 12.6% and investment income 10.5%.

Average total family income varied greatly

Focus Table XIV.4 introduces a further breakdown of unincorporated Canadian farms into those that are business-focused and those that are non-business-focused (or "lifestyle") farms. Average total family income varied greatly across these different farm typology groups, from about $16,500 for the families associated with large unincorporated farms that are low-income non-business-oriented farms to $117,600 for families associated with unincorporated very large business-focused farms.

The contribution from off-farm income varied from 32% to 102% of total income

The contribution from off-farm income also varied considerably - from 32% for families associated with unincorporated very large business-focused farms to 102% for families operating farms classified as medium-sized lifestyle farms. In the latter case, off-farm income is thus used not only for the totality of the families' living but also the operation of a small hobby farm holding (see Focus Table XIV.5 and Focus Figure XIV.4).

For small non-business focused farms, the share of off-farm income is 77% and of this amount the share from wages and salaries and non-farm self-employment income account for only 24%. Investment income and pension income was, not surprisingly, high at 22% and 46.5%, respectively. The income of families with very large business-focused farms was 32% from off-farm income and of this source about 68% originated from wages, salaries and non-farm self-employment income. Investment income had a share of 16%.

Families operating farms in the categories of small, medium and large business-focused farms as well as the medium-sized lifestyle farms all had a very large share of wages, salaries and non-farm self-employment income as a share of total off-farm income - between 72% and 88%. Investment income and pension income were less than 10% for these groups of farms.

(iv) Steady increase in wealth accumulation

The economic well-being of the farm family is not only dependent of total family income but also on their wealth. In the period 1996-2000, average total income per farm family operating an unincorporated farm increased by almost 17% (see Focus Table XIV.5). In the same period, equity in the agriculture sector increased by almost 16%. For the period 1995-2003, the increase amounted to 30.5% (see Focus Table XIV.7 and Focus Figure XIV.5).

In 2003, farm real estate accounted for almost 60% of total farm sector assets, of which land accounted for 44%. Machinery had a share of 14% followed by "quota", which essentially is a licence to sell a certain amount of a specific product, with 10%. The value of this item increased by 119% in the period 1995-2003. The value of farm real estate increased by 37%, of which service buildings and homes had the highest growth, 42% and 48%, respectively.

With respect to the debt structure of Canadian farms, Focus Figure XIV.5 shows that current liabilities in relation to total liabilities increased from about 17% in 1997 to about 23% in 2003. Return of equity shows rather large fluctuations - almost halving between 1996 and 1997 after which it slowly increased or was flat until 2001. It then dropped between 2001 and 2002 before immediately recovering in 2003 to the trend level of 1997-2001.

(v) Notes to the data and the data sources

- The average net income measures do not include any income in kind such as the value of goods produced for home consumption, less cost of inputs.
- The value of owner-occupied housing is not imputed for any of the data on total incomes for the "operator," "family" or the "household" associated with farms.
- Tables XIV.2 to XIV.4 relate to the operators of unincorporated and incorporated farms. Tables XIV.5 and XIV.6 represent only for unincorporated farms.
- If nothing else is mentioned, net operating income refers to income before capital cost allowance. When income is measured after capital cost allowance, the capital cost allowance is obtained from the income tax returns. This does not correspond to the economic depreciation used in the farm income accounts (in aggregate, they are somewhat similar in magnitude, however).
- Farm family refers to a married couple or a common-law couple with or without children at home; or a lone parent of any marital status, with at least one child living at home. There is no restriction on the age of the children. Children must report a marital status other than married or living common-law and have no children in the household. The concept of farm family thus differs somewhat from the concept of household.

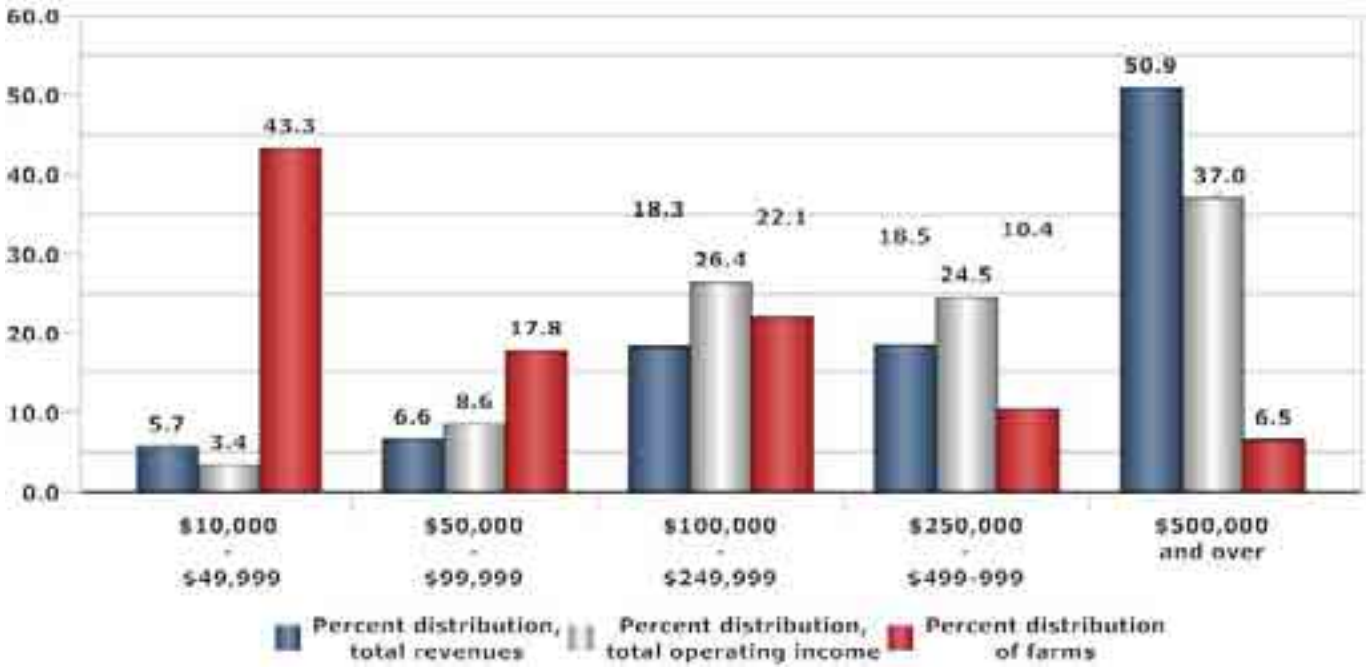
- Within Statistics Canada, the division responsible for generating statistical data from the income tax records of individuals (the Small Area and Administrative Data Division (SAADD)) assembles a "family file" (for families as defined above) using the information on the individual income tax records that indicate the Social Insurance Number of the spouse and the number of dependent children. For the total income of "farming families", the detailed information on farm revenues by item and farm expenses by item from the farm taxation record is linked, via the Social Insurance Number of the operator, to the SAADD "family file".

FOCUS TABLE XIV.2
Operating revenues and expenses by revenue classes in Canada, 1996 and 2001

	REVENUE CLASSES					
	$10,000 - $49,999	S50,000- $99,999	$100,000- $249,999	$250,000- $499,999	$500,000 and over	All
1996						
Number of farms	103,375	45,770	55,045	20,310	9,805	234,390
Average total revenues per farm, C$	25,036	72,330	158,704	341,451	1,285,967	145,837
Average net operating income per farm, C$	**1,541**	**13,818**	**34,031**	**67,835**	**160,801**	**23,977**
2001						
Number of farms	97,220	40,010	49,590	23,310	14,545	224,670
Average total revenues per farm, C$	25,332	72,167	160,633	344,071	1,519,559	193,329
Average net operating income per farm, C$	**2,297**	**14,043**	**34,713**	**68,544**	**165,751**	**28,998**
% change 1996-2001	**49.0**	**1.6**	**2.0**	**1.0**	**3.1**	**20.9**
Average net operating income per farm after capital cost allowance, C$	**-1,438**	**5,097**	**16,282**	**31,832**	**70,177**	**11,725**
Operating margin	0.09	0.19	0.22	0.20	0.11	0.15
Operating margin after capital cost allowance	0.06	0.07	0.10	0.09	0.05	0.06

Source: *Statistics Canada, Farm and Off-Farm Income Statistics 2001*, Catalogue no. 21-019-XIE, May 2004.
Statistics Canada, Economic Overview of Farm Incomes, 1996, Vol.1, No. 1, Oct. 1998.

FOCUS FIGURE XIV.2
Percentage distribution of revenues, operating income and number of farms by revenue classes in Canada in 2001



Source: *Statistics Canada, Farm and Off-Farm Income Statistics 2001*, Catalogue no. 21-019-XIE, May 2004.
Statistics Canada, Economic Overview of Farm Incomes, 1996, Vol.1, No. 1, Oct. 1998.

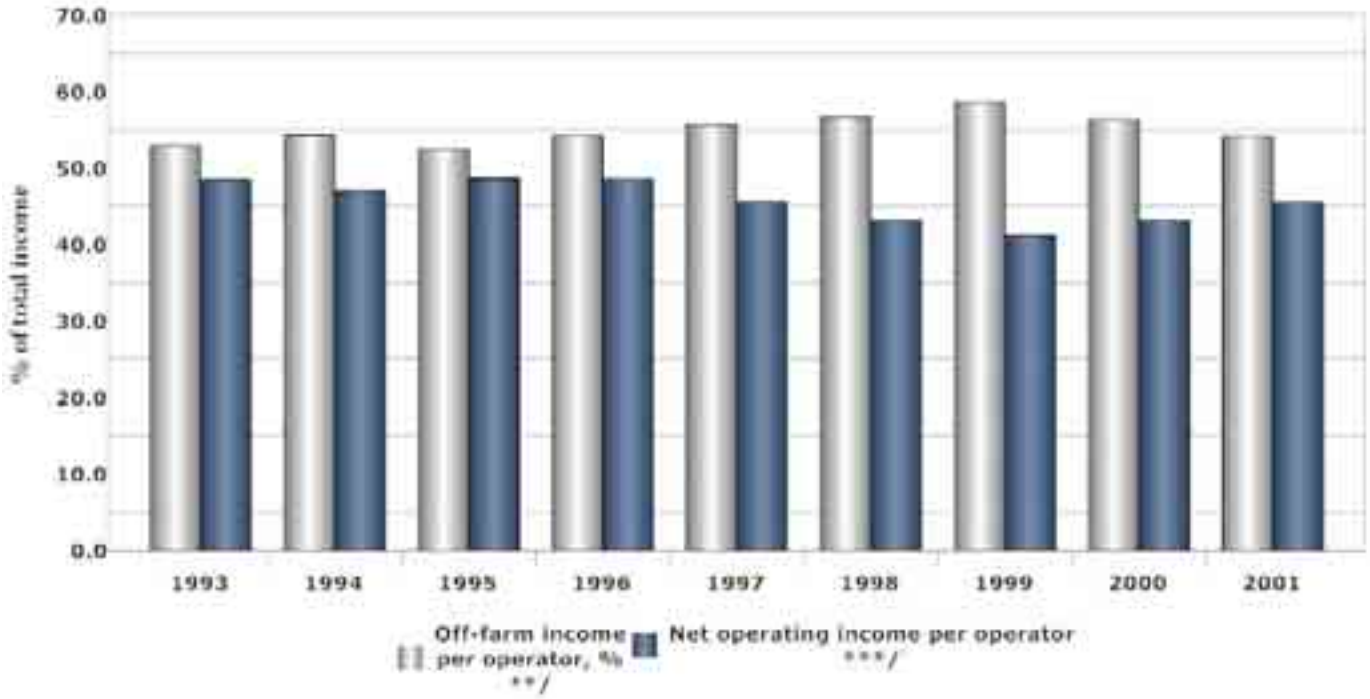
FOCUS TABLE XIV.3
Average total income per operator in Canada, 1993-2001, Current C$

	1993	1995	1997	1999	2000	2001	% change 1993-2001
Average total income per operator, C$*/	**33,334**	**37,220**	**39,976**	**40,009**	**43,558**	**46,998**	**41.0**
Average off-farm income per operator, C$ **/	17,434	19,206	22,220	23,210	24,455	25,729	**47.6**
Average net operating income per operator, C$ ***/	15,900	18,014	17,757	16,800	19,103	21,269	**33.8**
Off-farm income per operator, % **/	52.3	51.6	55.6	58.0	56.1	54.7	
Net operating income per operator ***/	47.7	48.4	44.4	42.0	43.9	45.3	

*/ Excludes communal farming operations, **/Excludes taxable capital gains, ***/ Before capital cost allowance

Source: *Statistics Canada, Economic Overview of Farm Incomes*, Vol.2, No. 1, Dec 2001.
Statistics Canada, Farm and Off-Farm Income Statistics 2001, Catalogue no. 21-019-XIE, May 2004.

FOCUS FIGURE XIV.3
Percentage share of net farm income and off-farm income per operator in Canada, 1993-2001



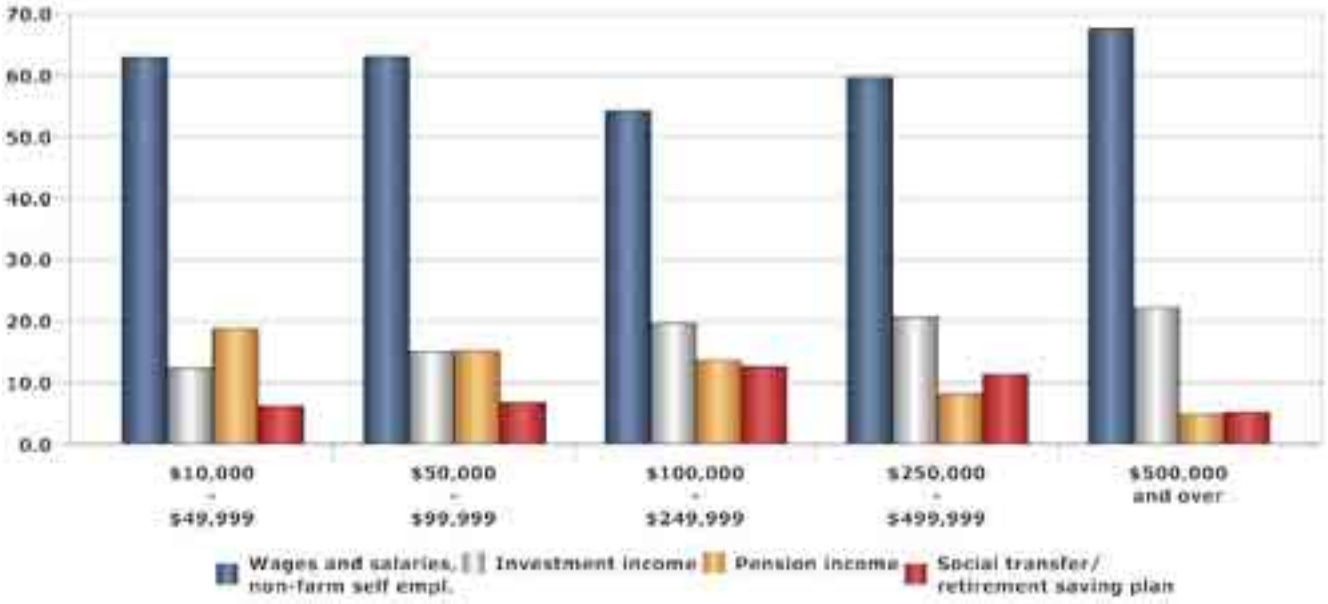
FOCUS TABLE XIV.4
Average total income per operator in Canada, 1993-2001, Current C$

	REVENUE CLASSES						
	$10,000 - $49,999	$50,000- $99,999	$100,000- $249,999	$250,000- $499,999	$500,000 and over	All	%
1998							
Number of operators	118,150	54,330	71,670	33,720	18,890	296,760	
Number of farms	101,480	45,140	52,650	20,310	10,390	229,970	
FARM INCOME							
Total revenues	21,594	59,807	117,497	206,114	717,126	116,962	
Total expenses	20,107	48,057	92,591	166,618	646,205	99,205	
Net Operating Income	**1,487**	**11,750**	**24,906**	**39,496**	**70,921**	**17,757**	**44.4**
OFF-FARM INCOME							
Wages and salaries	15,881	10,760	6,671	9,834	22,282	12,246	31.1
Net non-farm self – employment income	1,847	1,182	1,056	1,033	1,611	1,427	3.6
Investment income	3,212	2,853	2,745	4,749	7,691	3,494	8.7
Pension income	4,593	3,238	1,685	1,308	1,621	3,080	7.7
Government social transfer	715	503	465	468	386	567	1.4
Other off-farm income	700	1,027	1,012	1,083	,1026	899	2.2
Retirement savings plan income	420	330	318	354	371	368	0.9
Total farm income (excluding taxable capital gains)	**27,336**	**19,882**	**13,845**	**18,687**	**34,828**	**22,220**	**55.6**
Total operator income	**28,853**	**31,632**	**38,751**	**58,183**	**105,749**	**39,977**	**100.0**
Off-farm income as a share of total income (%)	**94.8**	**62.9**	**35.7**	**32.1**	**32.9**	**55.6**	
2001							
Number of operators	114,020	49,060	66,380	37,910	26,630	293,990	
Number of farms	97,215	40,005	49,590	23,310	14,265	224,380	
FARM INCOME							
Total revenues							
Total expenses							
Net Operating Income	**1,9581**	**11,451**	**25,934**	**42,164**	**80,673**	**21,269**	**45.3**
OFF-FARM INCOME							
Wages and salaries	17,389	13,720	8,217	10,213	24,563	14,431	30.7
Net non-farm self – employment income	1,679	1,677	1,154	1,157	1,926	1,515	3.2
Investment income	3,756	3,657	3,414	3,936	8,734	4,173	8.8
Pension income	5,673	3,680	2,357	1,551	1,929	3,721	7.9
Government social transfer	691	546	524	595	512	601	1.3
Retirement savings plan income	1,099	1,125	1,635	1,585	1,516	1,325	2.8
Total farm income (excluding taxable capital gains)	**30,287**	**24,405**	**17,301**	**19,037**	**39,180**	**25730**	**54.7**
Total operator income	**32,245**	**35,856**	**43,235**	**61,201**	**119,853**	**46999**	**100.0**
Off-farm income as a share of total income (%)	**93.3**	**68.1**	**40.0**	**31.1**	**32.7**	**54.7**	
% change 1998-2001							
Number of operators	-3.5	-9.7	-7.4	12.4	41.0	-0.9	
Number of farms	-4.2	-11.4	-5.8	14.8	37.3	-2.4	
FARM INCOME							
Total revenues							
Total expenses							
Net Operating Income	**31.7**	**-2.5**	**4.1**	**6.8**	**13.8**	**19.8**	

OFF-FARM INCOME							
Wages and salaries	9.5	27.5	23.2	3.9	10.2	16.1	
Net non-farm self – employment income	-9.1	41.9	9.3	12.0	19.6	6.2	
Investment income	16.9	28.2	24.4	-17.1	13.6	18.4	
Pension income	23.5	13.7	39.9	18.6	19.0	20.8	
Government social transfer	-3.4	8.5	12.7	27.1	32.6	6.0	
Retirement savings plan income	161.5	240.9	414.2	347.7	308.6	260.1	
Total farm income (excluding taxable capital gains)	**10.7**	**22.7**	**25.0**	**1.9**	**12.5**	**25.8**	
Total operator income	**11.8**	**13.4**	**11.6**	**5.2**	**13.3**	**17.6**	

Source: *Statistics Canada, Farm and Off-Farm Income Statistics 2001*, Catalogue no. 21-019-XIE, May 2004.
Statistics Canada, Economic Overview of Farm Incomes, Vol.2, No. 1, Dec 2001.

FOCUS FIGURE XIV.4
Sources of off-farm income as a percentage of total off-farm income



	$10,000 - $49,999	$50,000- $99,999	$100,000- $249,999	$250,000- $499,999	$500,000 and over	All
Wages and salaries	57.4	56.2	47.5	53.6	62.7	**56.1**
Net non-farm self – employment income	5.5	6.9	6.7	6.1	4.9	**5.9**
Investment income	12.4	15.0	19.7	20.7	22.3	**16.1**
Pension income	18.7	15.1	13.6	8.1	4.9	**14.5**
Government social transfer	2.3	2.2	3.0	3.1	1.3	**2.3**
Retirement savings plan income	3.6	4.6	9.5	8.3	3.9	**5.1**
	100.0	100.0	100.0	100.0	100.0	**100.0**

Source: *Statistics Canada, Economic Overview of Farm Incomes*, Vol.2, No. 1, Dec 2001.
Statistics Canada, Farm and Off-Farm Income Statistics 2001, Catalogue no. 21-019-XIE, May 2004.

FOCUS TABLE XIV.5
Off-farm and net operating income per farm family, unincorporated sector, Canada, 1996-2000

	1996	1997	1998	1999	2000	%, 1996-2000
Number of farm families	161,580	162,450	154,970	151,840	147,680	-8.6
Number of farms	157,810	159,060	152,980	150,500	146,400	-7.2
Average off-farm income per farm family	39,131	41,165	43,677	45,419	48,682	24.4
Average operating income per farm family	17,658	18,029	17,432	16,803	17,588	-0.4
Average total income per farm family	56,789	59,194	61,109	62,222	66,270	16.7
Off-farm income as a percentage of total income	**68.9**	**69.5**	**71.5**	**73.0**	**73.5**	
Average total income per farm family after capital cost allowance	46,290	48,178	49,586	50,328	54,545	17.8

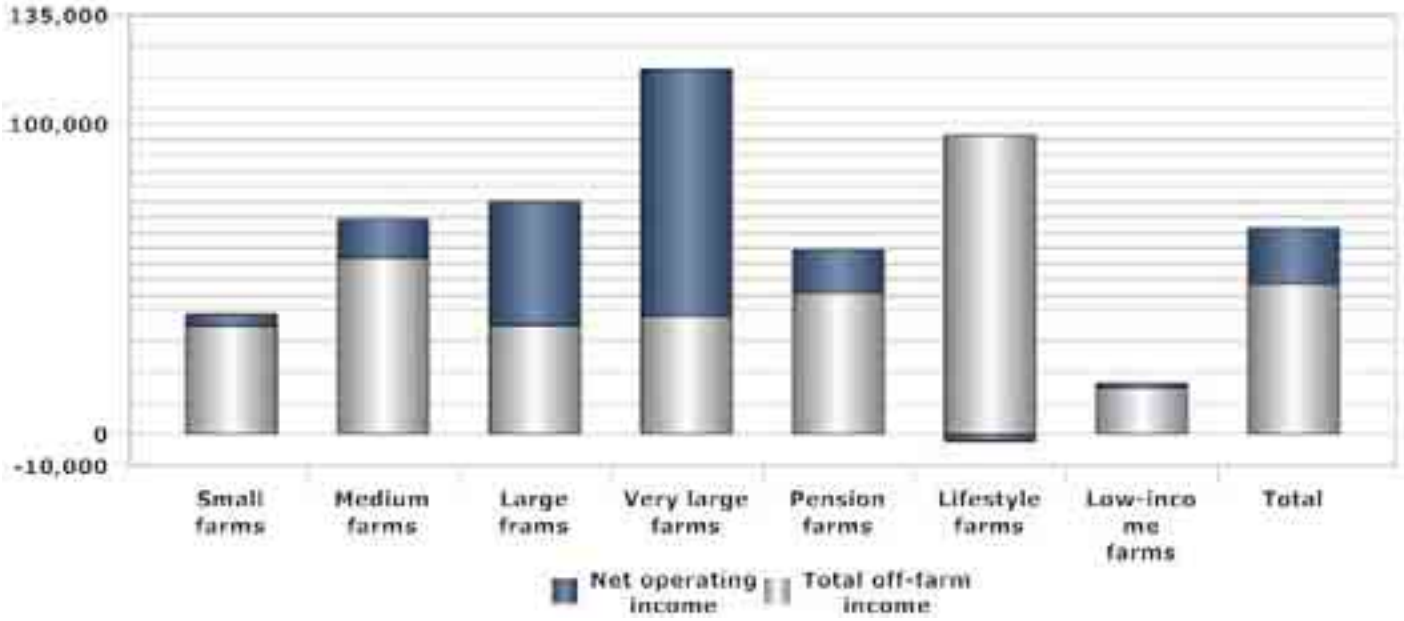
Source: *Statistics Canada*, *Farm and Off-Farm Income Statistics 2001*, Catalogue no. 21-019-XIE, May 2004.

FOCUS TABLE XIV.6
Average off-farm income by source and average net operating income of farm families by farm typology group, unincorporated sector, in Canada in 2000, C$

	BUSINESS-FOCUSED FARMS				NON-BUSINESS-FOCUSED FARMS			
	SMALL FARMS	MEDIUM FARMS	LARGE FARMS	VERY LARGE FARMS	SMALL FARMS	MEDIUM FARMS	LARGE FARMS	TOTAL
Number of operators	139,701	17,340	40,220	3,590	35,140	24,780	12,640	147,680
Number of farms	14,020	17,550	39,340	3,070	35,140	24,500	12,770	146,400
OFF-FARM INCOME								
Wages and salaries	23,837	42,210	22,680	22,942	9,677	78,904	7,522	30,133
Net non-farm self – employment income	2,401	3,731	2,459	2,950	1,118	5,408	1,328	2,649
Investment income	2,121	4,198	3,395	6,012	10,054	4,975	1,390	5,110
Pension income	2,040	1,809	751	406	21,183	2,192	1,071	6,120
Government social transfer	3,317	2,382	2,536	2,731	615	2,003	2,707	2,065
Other off-farm income	1,046	2,522	3,213	2,861	2,861	2,474	814	2,561
Total off-farm income	**34,762**	**56,852**	**35,034**	**37,902**	**45,508**	**95,956**	**14,382**	**48,683**
Net program income	1,616	5,073	10,627	25,389	4,148	1,583	3,003	5,770
Market income	2,052	7,288	29,071	54,306	9,611	-3,812	-1,353	11,818
Net operating income	**3,668**	**12,361**	**39,698**	**79,695**	**13,759**	**-2,229**	**1,650**	**17,588**
Total income of farm families	**38,430**	**69,213**	**74,732**	**117,597**	**59,267**	**93,727**	**16,482**	**66,271**
Percentage share off-farm income	***90.5***	***82.1***	***46.9***	***32.2***	***76.8***	***102.4***	***90.0***	***73.5***
Percentage of total off-farm income:								
Wages and salaries + non-farm self empl.	75.5	80.8	71.8	68.3	23.7	87.9	59.7	67.4
Investment income	6.1	7.4	9.7	15.9	22.1	5.2	9.4	10.5
Pension income	5.9	3.2	2.1	1.1	46.5	2.3	7.2	12.6
Other	12.6	8.6	16.4	14.8	7.6	4.7	23.7	9.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: *Statistics Canada, Farm and Off-Farm Income Statistics 2001*, Catalogue no. 21-019-XIE, May 2004.

FOCUS FIGURE XIV.5
Average off-farm income and net operating income per farm family by farm typology in Canada in 2000, C$



FOCUS TABLE XIV.7
Balance sheet of the agriculture sector, including non-operator landlords and excluding personal shares of households, current C$ million

	1995	2000	2001	2002	2003	% 1995-2003	% share 2003
Current assets (CA)	17,100	19,200	19,800	20,100	21,100	23.4	9.1
of which:							
Inventories	14,300	16,200	16,400	16,400	17,100	19.6	
Quota	10,500	18,200	18,800	22,100	23,000	119.0	10.0
Breading livestock	7,600	9,800	9,900	9,600	9,900	30.3	4.3
Machinery	25,600	30,900	31,600	31,700	31,900	24.6	13.8
Farm real estate	100,200	126,700	130,400	134,300	137,600	37.3	59.6
of which:							
Land	75,500	95,000	97,600	99,900	102,400	35.6	44.3
Service buildings	18,500	24,000	24,900	25,600	26,200	41.6	11.3
Homes	6,100	7,700	7,900	8,800	9,000	47.5	3.9
Other long term assets	5,800	6,600	6,400	7,600	7,400	27.6	3.2
Total assets (TA)	166,900	211,400	217,000	225,400	230,900	38.3	100.0
Current liabilities	4,300	7,500	8,200	8,500	9,900	130.2	
Long-term liabilities	19,200	28,300	29,300	32,300	34,000	77.1	
Total liabilities (TL)	23,500	35,700	37,600	40,800	43,900	86.8	
Equity (E)	143,400	175,700	179,400	184,600	187,100	30.5	
Current liquidity ratio (CA/CL)	3.991	2.569	2.404	2.368	2.133		
Debt structure	0.182	0.209	0.219	0.208	0.226		
Return on equity	0.029	0.021	0.022	0.014	0.020		

Source: *Statistics Canada, Balance sheet of the agriculture sector*, May 2004. Catalogue no. 21-016-XIE, Vol. 3, No. 1.

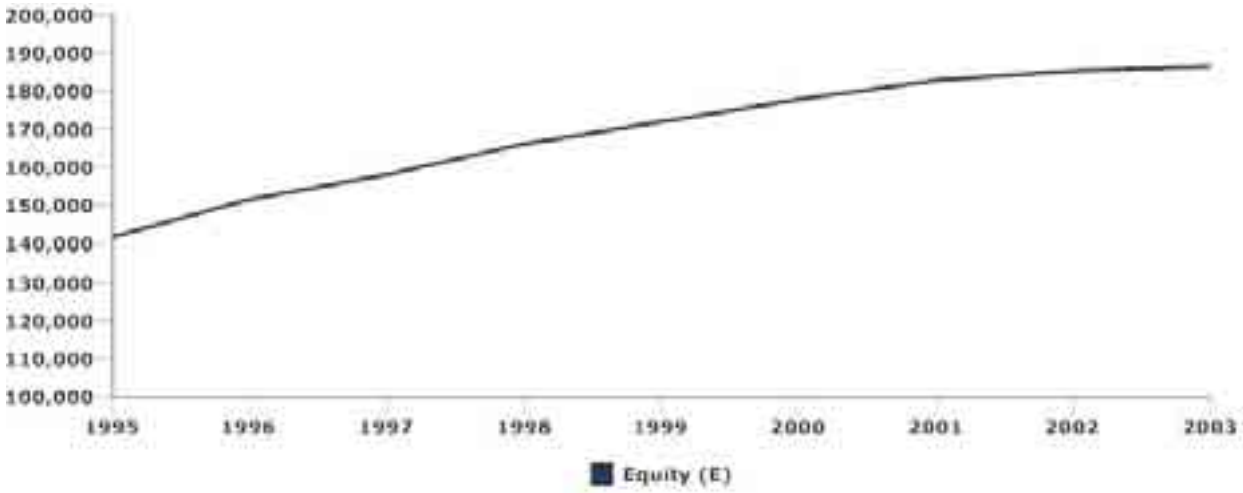
FOCUS TABLE XIV.8
Net farm income in Canada, 1995-2003, current C$ million

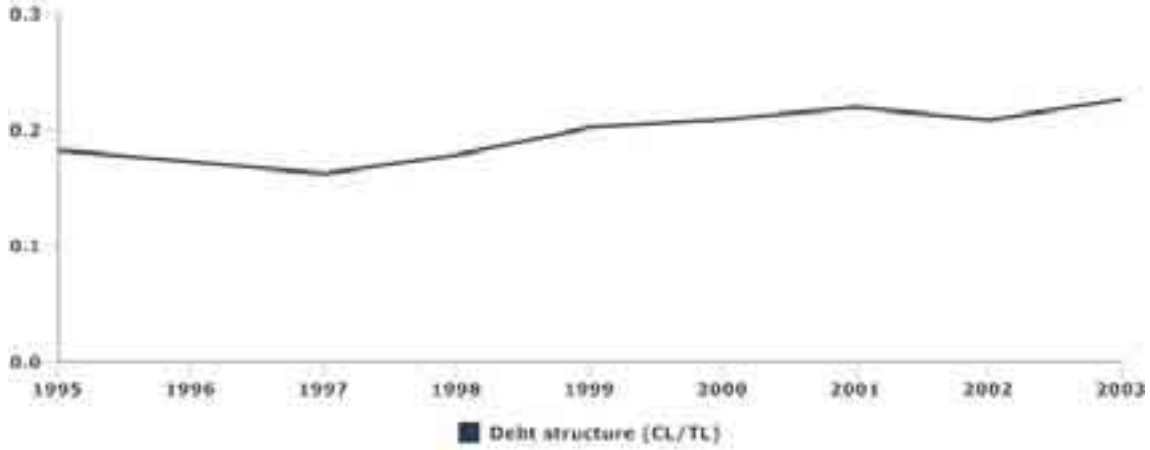
	1995	2000	2001	2002	2003
Net cash income */	5,590	6,360	8,090	7,290	4,440
Depreciation charges	3,460	4,330	4,460	4,520	4,590
Value of inventory change	710	280	-1,030	-1,580	2,660
Total net income **	**2,990**	**2,460**	**2,720**	**1,330**	**2,630**

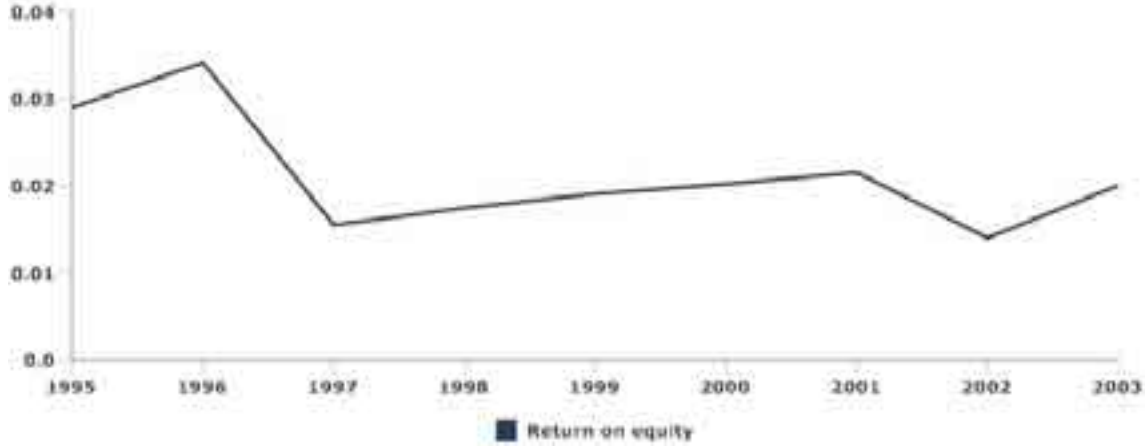
*/ Net cash income = total cash receipts – operating expenses after rebates
**/ Total net income = net cash income + income in kind – depreciation charges + value of inventory change

Source: *Statistics Canada. Net farm income, November 2004*. Catalogue No. 21-010-XIE, Vol. 3, No. 2.

FOCUS FIGURE XIV.6
Equity, debt structure (current liabilities in relation to total liabilities) and return on equity in Canada, 1995-2003







Focus on Income and Wealth Statistics for Denmark

***Editor's note**: Readers should be aware that interest payments in Denmark represent a uniquely large share of the cost faced by farmers among the Member States of the EU. This is linked to the way in which agricultural assets are transferred between generations that, typically, involve sales from parents to children. In order to support the high interest burden that results from the credit taken to purchase these assets by family successors there is a tendency for the spouses of Danish farmers, and frequently the farmers also, to work full-time or part-time outside agriculture, particularly in the early years of succession. This in turn has some impact on the choice of farming enterprise, since some forms of production (such as cereals) are more compatible with part-time activity than others (such as dairying). The high burden of interest payments (which often leads to negative profits from the farm business) and the treatment of interest in the taxation system of Denmark means that there is an emphasis on measuring income before interest charges. It also means that when households are classified according to their main income source (which, for farming, would normally be after deducting interest charges associated with the business), numbers of agricultural households appear to be disproportionately small. Further discussion is contained in Eurostat (2002).*

(i) Introduction

For many years, Statistics Denmark has compiled agricultural household income statistics, partly to accord with an agreement with Eurostat for EU statistics and partly to provide domestic information. A main objective for Eurostat's Income of the Agricultural Households Sector (IAHS) statistics (now suspended) was to compare agricultural household income with the income of other socio-professional households, while the main objective for the domestic statistics is to show differences between different types of farming.

The household income statistics are based on a combination of registers of persons, households, income and agricultural holdings. The methodology is further described in section (ii) below. The statistics for Eurostat are presented in section (iii). In section (iv) the income situation for different types of agricultural holdings and other subgroups of farms is presented. Finally, the issue of wealth is introduced with the presentation of figures from the Danish Farm Accountancy Data Network (FADN) statistics. The FADN statistics include information on the assets and debts of family farms.

(ii) Combining of registers and income information

The statistics introduced here are based on registers of agriculture, households and income. The income register is basically information from tax authorities, which provide Statistics Denmark with data on different kinds of income of all relevant inhabitants. Furthermore, there is information on tax, interest and social contributions. Information on disposable income can be calculated from these data.

The income register contains information on the kind of economic activity undertaken by the individual, for example, whether the individual is an employer (broken down by line of business) or an employee.

The household register records information on individuals belonging to a household unit. From these data the number of households and the number of consumer units (CU) can be calculated. The principal, or head, of the household unit counts as 1 CU, other adults within the household count as 0.7 CU and children in the household count as 0.5 CU. The key to the income register is the personal ID-number of the individual.

The agricultural register is the Farm Structure Survey (FSS) register. This contains the annual sample of approximately 50,000 farms in Denmark that have more than five hectares of land or are of similar economic size in terms of production. The register includes, for example, information on the type of farming, standard labour hours, farm location and the age of the farmer. As a result, several subgroups can be delineated.

Almost all farms in the FSS (more than 98%) are associated with an individual owner who has a Danish ID-number. It is the presence of this ID-number that facilitates linkage to the other registers. Using the sample to represent the whole population of farm holdings, a specific income statistic on farmers can be compiled. Moreover, farm income can be broken down by subgroup.

In the full dataset, the following variables are compiled:

A. Income from agriculture (calculated according to tax regulations)
B. Income from other enterprises (calculated according to tax regulations)
C. Remuneration of owner-occupied dwellings
D. Wages and salaries
E. Property income (including interest from financial assets)
F. Social benefits received (including pensions)
G. ***Total income*** **(A+B+C+D+E+F)**
H. Interest on loans
I. Tax on income and capital
J. Social contributions, including savings for retirement
K. ***Disposal income*** **(G-H-I-J)**

In cases where farmers (known from the farm register) have other businesses in addition to farming, the allocation of income is based on the most import business.

In addition, the remuneration from owner-occupied dwellings, calculated as a percentage of the value assessed by the public authority, is not taken into account in the specific Danish statistics as almost all farmers own their dwelling. Therefore, the artificial calculation used to improve comparability between owned and rented dwellings is not relevant.

Finally, it should be mentioned, that the variables do not include all the specifications listed in the questionnaire from Eurostat. However, it generally covers the overall framework.

(iii) Comparison between farmers and other professional groups

One of the main reasons for compiling agricultural household income statistics is to analyse the situation in terms of the targets set out in the EU's Common Agricultural Policy (CAP), namely to ensure a fair income among farmers and their families. To make any assessment of this kind a comparison with other groups is necessary. In Focus Table XIV.9 figures comparing farmers to other socio-professional groups within Denmark are presented.

It is important to note, that the definition of farmers in this context is the "narrow" definition, where only families whose main income comes from farming are included (see Chapter IX of this Handbook). This number (approximately 15,000 in 2002) represented only about 30 per cent of the total number of "farmers" In Denmark. It should be further noted, that the number of farms defined as "full-time" farms in 2002 was approximately 23,000. The discrepancy in the numbers indicates that about one third of full-time farm could not fulfil the income criteria of the "narrow" definition that year.

Looking at the results, it is difficult to make comparisons of the income composition on all the variables. In particular this is because profit from agriculture and other businesses do not include a deduction for interest payments related to the business. However, looking at the bottom line, the farmers' net disposable income (202,000 DKK per household in 2002) was among the lowest of all the groups. This is particularly important in light of the fact that farm households had the highest consumer units per household.

Looking at the composition of income, it can be seen that households with employers as the main person providing income still had a relatively high income from wages and salaries. This suggests that the spouse of the employer often worked for wages outside of the family business. Furthermore, the figures showed that, amongst all employers and own-account workers, farmers had the highest level of interest payments. This indicates that debts (probably related to high capital input) were very high for farm households.

(iv) Comparison between different types of farms

In the Danish context, the compilation of agricultural household income is seen as an important supplement to the Economic Accounts of Agriculture, because agricultural activity is very rarely the only income generating activity for the farm family. In fact, part-time farmers (where the standard labour input to the farm is less than one work unit), account for more than half of all farmers in Denmark. In 2002, part-time farms constituted 53% of all farms in the Farm Structure Survey.

FOCUS TABLE XIV.9
Income and income composition by socio-professional group

	Farmers	Other employers	All employers	Manual employees	Non-manual employees	All others	All except farmers	All households
	1,000 DKK per household							
Profit, agriculture	481	0	65	0	0	0	0	3
Profit, other enterprises	3	420	364	3	6	1	18	18
Remuneration of own dwelling	11	18	17	7	16	2	7	7
Wages and salaries	123	122	122	321	516	8	232	231
Property income	18	15	15	3	7	7	6	6
Social benefits received	34	33	33	34	30	165	85	85
Gross income	669	608	616	368	576	182	349	351
Interest on loans	264	99	121	29	48	7	27	29
Taxes on income and capital	124	171	165	96	176	47	97	97
Social contributions	79	89	88	46	69	4	36	36
Net disposal income	202	248	242	197	283	125	189	189
								numbers, 1,000
Households	15	95	109	857	547	988	2486	2501
Household members	39	225	263	1,746	1,309	1,383	4,663	4,702
Consumer units	29	174	203	1,399	1,007	1,246	3,826	3,855
								per household
Household members	2.65	2.38	2.41	2.04	2.39	1.40	1.88	1.88
Consumer units	1.99	1.84	1.86	1.63	1.84	1.26	1.54	1.54

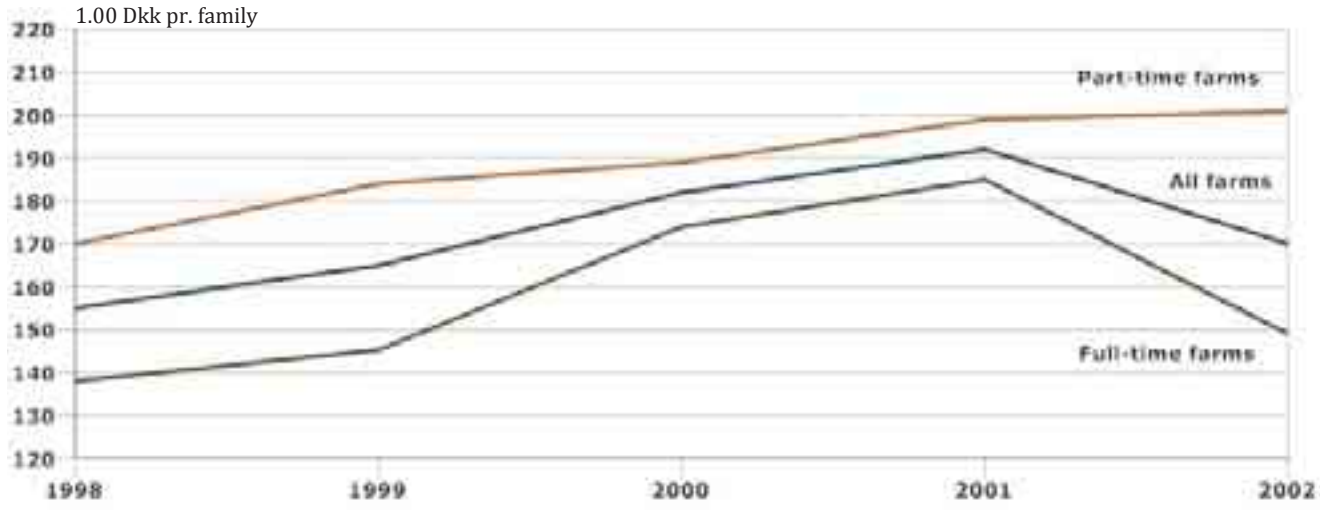
Source: Income of Agricultural Household Statistics 2002, delivery to Eurostat.

Figure XIV.7 shows disposable income broken down by full-time and part-time farms. It can be seen that part-time farmers, in general, had a higher disposable income than full-time farmers. Furthermore, there was a steep decrease in the disposable income for full-time farms in 2002. The figures are in the Annex to this section (Focus Tables XIV.11-XIV.13).

The disposable income for all farms in 2002 was 176,000 DKK. However, it was seen in the previous section that farms, using the "narrow" definition, had an income of 202,000 DKK. Corrected for the remuneration of own dwelling this figure was reduced to 191,000 DKK, still 15,000 DKK higher than for all farms.

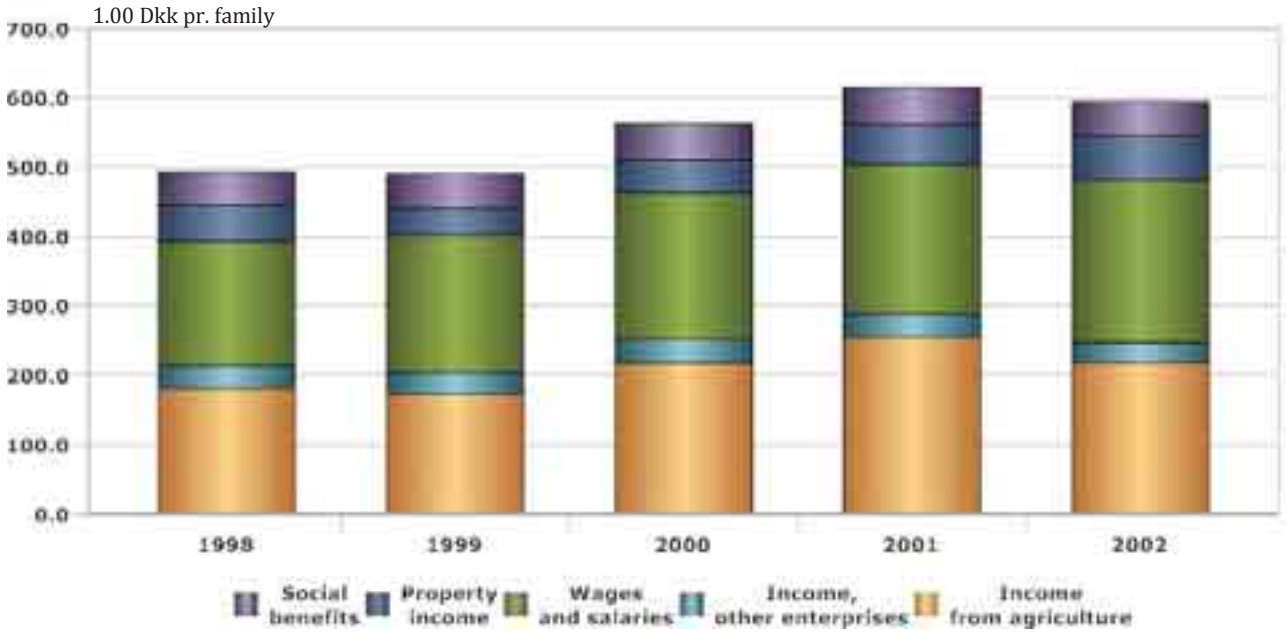
Figure XIV.7 shows the composition of total income for agricultural households. It can be seen that less than the half of total income was derived from agricultural activity. Income from wages and salaries was as important as agriculture – even before agricultural income had been reduced by any interest related to farming activities. This is a significant result.

FOCUS FIGURE XIV.7
Disposable income for agricultural households, all farms



Source: Income of Agricultural Households Statistics in Denmark, Statistics Denmark, SE 2004:11

FOCUS FIGURE XIV.8
Disposable income for agricultural households, all farms

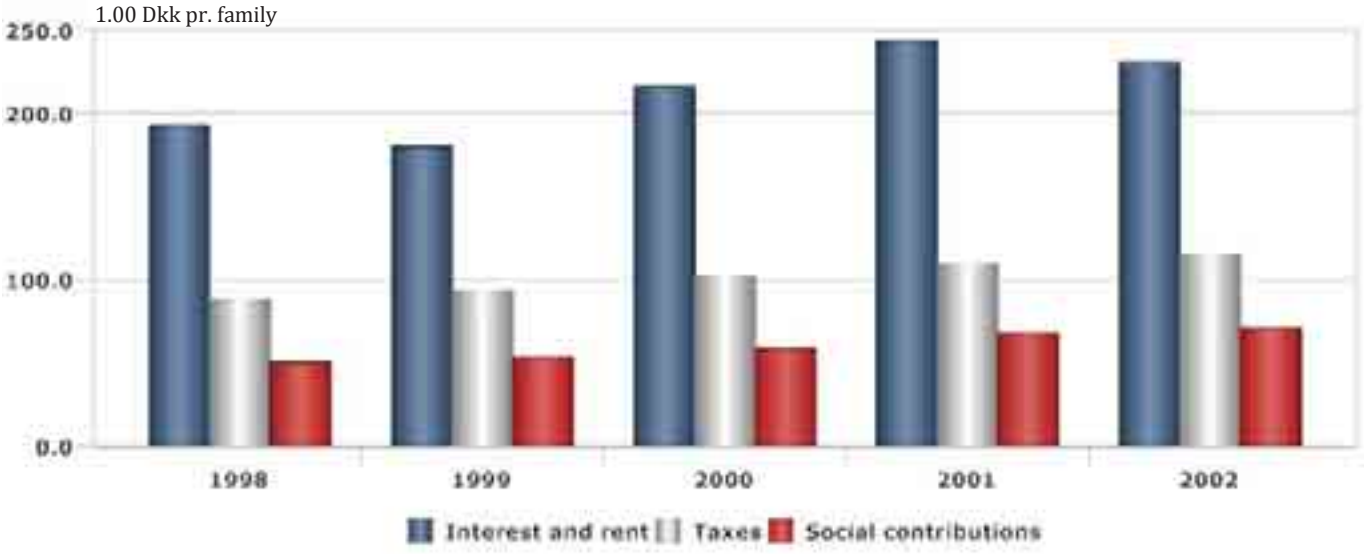


Source: Income of Agricultural Households Statistics in Denmark, Statistics Denmark, SE 2004:11

However, it is very important to distinguish between full-time and part-time farms when analysing the composition of income. With full-time farms, almost 60% of total income in 2002 was derived from agricultural profit whereas it was only 7% for part-time farms. However, the portion from wages and salaries was 21% for full-time farms and 65% for part-time farms. Social benefits counted more for part-time farming households where the number of pensioners was relatively high.

The main costs paid out of total income are shown in Figure XIV.8. It is obvious that interest was the most important element. In fact, interest was twice as high as taxes for all agricultural households. Looking at full time farms, however, interest was 3.4 times the taxes, while the taxes on a part-time farm were 25% higher than the interest. This difference is mainly explained by differences in debt which was, in turn, related to the farm capital input.

FOCUS FIGURE XIV.9
Interest, taxes and social contributions at agricultural households, all farm



Source: Income of Agricultural Households Statistics in Denmark, Statistics Denmark, SE 2004:11

Looking at farms broken down by age of farmer (see Focus Tables XIV.14- XIV.16 after references), there was a tendency for older farmers (up to 60 years) to have a slightly decreasing portion of their total income derived from agriculture and an increasing portion of their income derived from wages and salaries and from property income. On the expenditure side, it is significant that interest payments lowered with age while taxes increased.

These patterns held for both full-time and part-time agricultural households. However, when comparing income composition by age groups, it should be noted, that the family size of the agricultural households in the youngest and oldest groups was much smaller than in the other groups.

(v) Development of wealth in agricultural households

Statistics Denmark has no specific statistics on wealth among agricultural households. However, The Danish Institute of Food Economics is compiling Farm Account Data Network (FADN) statistics on Denmark. This FADN framework means that some information on wealth by household will be available even though it will not be possible to get full information on all farms.

FOCUS TABLE XIV.10
Assets and liabilities: Age groups, full-time farms, 2003

	FARMER'S AGE, YEARS				
	<34	FROM 35 TO 44	FROM45 TO 54	FROM 55 TO 64	>65
	1,000 DKK per farm				
Balance in the end of the year					
Agricultural assets	11,071	10,984	10,480	8,890	9,005
Other physical assets	1,313	1,654	1,865	1,588	1,656
Financial assets	649	756	1,060	971	1,662
Assets Total	13,033	13,394	13,405	11,449	12,322
Bond loans	7,728	6,872	5,688	4,310	3,282
Bank loans	1,944	1,476	1,402	1,059	701
Other liabilities	873	738	620	504	518
Debt capital, total	10,545	9,086	7,710	5,873	4,501
Net capital	2,487	4,308	5,695	5,576	7,821
Ratio of debts	80.9	67.8	57.5	51.3	36.5

Source: Agricultural Account Statistics 2003, Danish Institute of Food Economics

However, statistics on the assets and debts of full-time farms are available. The assets and debts of full-time farms, for five age groups, are shown in Focus Table XIV.10. It is important to note that the market value of the farm is based on public assessment and can be over- or underestimated. Nevertheless, the figures in the table clearly indicate that there has been a consistent gain of net capital during the life of the farmer, with an increase in net capital from approximately 2.5 million DKK for young farmers to 7.8 million DKK in the oldest group, even though they had broadly similar total assets. From a lifetime income perspective this substantial gain of capital is important, particularly when comparing income in the agricultural sector with the income in other groups.

FOCUS PIECES

Danish Institute of Food Economics (2003). *Agricultural Account Statistics*.

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ANNEX

RESULTS FROM INCOME OF AGRICULTURAL HOUSEHOLDS STATISTICS – STATISTICS DENMARK

FOCUS TABLE XIV.11
Income for agricultural households, all farms

	1998	1999	2000	2001	2002
			1,000 Dkk		
+ Income from agriculture	184	173	217	240	218
+ Income, other enterprises	33	29	36	39	34
+ Wages and salaries	178	202	207	220	236
+ Property income	44	39	47	59	56
+ Social benefits	54	58	52	54	54
= Total income	**492**	**501**	**560**	**612**	**598**
÷ Interest and rent	195	188	218	244	236
÷ Taxes	90	93	100	110	117
÷ Social contributions	50	53	58	65	69
= Net disposal income	**156**	**168**	**183**	**193**	**176**
			number		
Farms	59,166	57,314	53,904	52,815	49,769

FOCUS TABLE XIV.12
Income for agricultural households, full-time farms

	1998	1999	2000	2001	2002
			1,000 Dkk		
+ Income from agriculture	353	349	422	464	425
+ Income, other enterprises	34	30	46	47	44
+ Wages and salaries	118	139	145	153	158
+ Property income	55	47	56	80	70
+ Social benefits	38	42	38	41	42
= Total income	**599**	**606**	**707**	**785**	**739**
÷ Interest and rent	317	313	365	411	399
÷ Taxes	87	88	100	112	118
÷ Social contributions	56	58	65	75	74
= Net disposal income	**138**	**148**	**177**	**188**	**148**
			number		
Farms	28,292	26,173	25,235	24,839	23,360

FOCUS TABLE XIV.13
Income for agricultural households, part-time farms

	1998	1999	2000	2001	2002
			1,000 kr		
+ Income from agriculture	30	26	37	41	34
+ Income, other enterprises	33	29	28	31	25
+ Wages and salaries	231	255	262	280	306
+ Property income	35	32	40	41	43
+ Social benefits	67	71	65	66	65
= Total income	**395**	**413**	**431**	**459**	**473**
÷ Interest and rent	84	83	90	96	92
÷ Taxes	92	97	101	109	116
÷ Social contributions	45	48	53	56	64
= Net disposal income	**174**	**185**	**189**	**198**	**201**
			number		
Farms	30,874	31,141	28,669	27,976	26,410

FOCUS TABLE XIV.14
Income for agricultural households, all farms by age of farmer

	Under 30 years	30-39 years	40-49 years	50-59 years	Over 60 years
			1,000 Dkk		
+ Income from agriculture	260	265	246	237	129
+ Income, other enterprises	25	27	31	43	35
+ Wages and salaries	208	269	321	278	86
+ Property income	32	25	37	78	78
+ Social benefits	39	45	32	27	114
= Total income	**565**	**629**	**667**	**664**	**442**
÷ Interest and rent	356	314	282	240	114
÷ Taxes	70	97	119	145	106
÷ Social contributions	39	59	74	87	56
= Net disposal income	**100**	**160**	**192**	**191**	**166**
			number		
Farms	1,661	9,069	13,211	13,067	12,761

FOCUS TABLE XIV.15
Income for agricultural households, all full-time farms by age of farmer

	Under 30 years	30-39 years	40-49 years	50-59 years	Over 60 years
			1,000 Dkk		
+ Income from agriculture	405	477	462	435	296
+ Income, other enterprises	38	29	42	39	73
+ Wages and salaries	135	153	201	163	92
+ Property income	54	36	47	85	124
+ Social benefits	37	44	34	23	86
= Total income	**669**	**739**	**787**	**745**	**671**
÷ Interest and rent	526	486	447	365	254
÷ Taxes	61	85	111	134	153
÷ Social contributions	32	56	75	90	77
= Net disposal income	**50**	**112**	**154**	**156**	**188**
			number		
Farms	966	4,719	6,685	6,746	4,244

FOCUS TABLE XIV.16
Income for agricultural households, all part-time farms by age of farmer

	Under 30 years	30-39 years	40-49 years	50-59 years	Over 60 years
	1,000 Dkk				
+ Income from agriculture	57	34	25	26	45
+ Income, other enterprises	8	24	20	47	16
+ Wages and salaries	310	395	443	401	83
+ Property income	3	12	26	71	55
+ Social benefits	43	46	30	32	128
= Total income	**420**	**511**	**544**	**577**	**327**
÷ Interest and rent	119	127	113	106	45
÷ Taxes	83	109	127	158	82
÷ Social contributions	48	62	72	85	45
= Net disposal income	**170**	**212**	**232**	**228**	**155**
	number				
Farms	695	4,350	6,526	6,321	8,517

Focus on Income and Wealth Statistics for Finland[1]

Finland is perhaps the best-equipped EU country with statistics on the incomes of agricultural households that enable *inter alia* comparisons to be drawn between them and other socio-professional groups. Its Income Distribution Statistics (IDS) are based largely but not exclusively on taxation information, and are linked to other registers. The total sample is some 10,000 households, of which about 700 turn out to be agricultural households. The public-access database allows the use of several measures of household income and a range of socio-professional groups, classified by the main income source of the household reference person; self-employed in agriculture is one such group. Results are available annually for the period 1990 to 2008; for simplicity consideration here is restricted to the period 2002 to 2008, the earlier results having been included in Eurostat's IAHS statistics (Eurostat, 2002).

Important in the present context is that results are given both per household and per consumer unit (CU), and both **means** and **medians** are calculated, thus meeting one of the issues faced when sectors contain small numbers of households with very high incomes drawn from large businesses which can affect averages and give a false picture of what is typical.

Two tables of results have been extracted from the IDS. The first gives the relative position of agricultural households (those whose reference person has self-employment in agriculture as their main income source) in terms of disposable income per household and per CU relative to the all-households average or median. The second gives, as examples, more detailed results for two recent years (2006 and 2008), in which a range of other socio-professional groups are identified.

Examination of these, together with similar detailed results for other years after 2000, finds the following:

- **Agricultural households have disposable incomes per household substantially above the all-households average**. This was rather more so when looking at medians (+60% for the period 2000-08) than averages (+46%). The difference between these figures suggests that there were proportionally more low income households among the all-household group, a finding consistent with the fact that it contains households headed by unemployed people, pensioners and other low income groups.
- **Agricultural households also have disposable incomes per CU above the all-households average, though by a smaller margin**. Depending on the year, averages were +2% to +24%, and medians +4% to +26% (with neither consistently the higher), but for the period as a whole the general level of elevation was closely similar (+14% for means and +15% for medians). In no year was the average or median disposable income of agricultural households below the all-households position.

[1]Text supplied by Berkeley Hill, 2011.

- On each of these measures, therefore, agricultural households in Finland appear to have **disposable incomes that compare favourably with the national average**. Furthermore, there is a suggestion in the figures that the relative position was somewhat higher in the later years than in the earlier ones.
- When compared with other socio-economic groups, agricultural households had incomes lower than those of households headed by other types of self-employed person (a grouping which would include other types of businesses and some professionals), though the margin was often small or non-existent when median income per CU were compared.
- When compared with households headed by an employee, whose main income would have been in the form of wages, over the period 2000 to 2008 farm households were a little lower in some years and a little higher in others, though in the last three years of the series agricultural households had both higher disposable incomes per household and per household member when comparing either mean or medians. A more disaggregated comparison by class of employee is possible, though has not been pursued here.

FOCUS TABLE XIV.17

Mean and median disposable incomes (per household and per Consumer Unit) of agricultural households as a percentage of the national all-households mean and median incomes, 2000 to 2008

	PER HOUSEHOLD		PER CU	
	mean	*median*	*mean*	*median*
2000	139	152	109	111
2001	135	150	102	104
2002	142	157	109	115
2003	141	156	111	114
2004	141	151	110	108
2005	157	154	124	116
2006	152	173	123	121
2007	161	180	124	126
2008	149	166	117	122
Average	**146**	**160**	**114**	**115**

Source: *Income Distribution Statistics*, Finland Statistics.

FOCUS TABLE XIV.18

Mean and Median Disposable Incomes of agricultural households and those of other socio-profession groups relative to the all-households average (per household and per Consumer Unit), 2006 and 2008

		HOUSEHOLDS (NO.)	PERSONS PER HOUSEHOLD	DISPOSABLE INCOME % OF ALL HOUSHOLDS	
				Mean	*Median*
2006					
All households	per household	2455000	2.12	100	100
	per CU	2455000	2.12	100	100
1.1 Self-empl. in agriculture	per household	40400	3.25	152	173
	per CU	40400	3.25	123	121
1.2 Other self-empl. persons	per household	145100	2.67	168	149
	per CU	145100	2.67	149	121
2. Employees	per household	1286700	2.47	120	131
	per CU	1286700	2.47	113	118
3. Students and schoolchildren	per household	82100	1.3	31	34
	per CU	82100	1.3	42	47
4. Pensioners	per household	746000	1.49	68	69
	per CU	746000	1.49	83	82
5. Unemployed	per household	121800	1.73	45	42
	per CU	121800	1.73	52	53
6. Others	per household	33000	2.03	50	45
	per CU	33000	2.03	55	53
2008					
All households	per household	2513500	2.09	100	100
	per CU	2513500	2.09	100	100
1.1 Self-empl. in agriculture	per household	36100	3.16	149	166
	per CU	36100	3.16	117	122
1.2 Other self-empl. persons	per household	152300	2.74	163	156
	per CU	152300	2.74	145	124
2. Employees	per household	1330000	2.42	118	132
	per CU	1330000	2.42	111	115
3. Students and schoolchildren	per household	75400	1.38	32	35
	per CU	75400	1.38	41	46
4. Pensioners	per household	776100	1.46	71	70
	per CU	776100	1.46	85	81
5. Unemployed	per household	110900	1.72	42	42
	per CU	110900	1.72	49	50
6. Others	per household	32700	2.08	66	54
	per CU	32700	2.08	76	57

Note: Classification is according to the main income of the household reference person. It is not clear at which point students and schoolchildren stop being counted as part of their parents'.

Source: *Income Distribution Statistics*, Finland Statistics

FOCUS PIECES

Eurostat (2002). *Income of the Agricultural Households Sector, 2001 Report.* Theme 5. Eurostat, Luxembourg.

Focus on Income and Wealth Statistics for France[1]

In France income results for agricultural and other socio-professional groups, including an all-households category, are published by INSEE (SCEES) on a periodic basis (every six years), the latest available information relating to 2003. These show disposable incomes and permit comparisons to be made per household or per Consumer Unit (which allows for differences in sizes of households); the latter is interpreted as a "standard of living" measure in France. Both means and medians can be the basis of comparison, as can distributions[2].

In the past France estimated incomes for its agricultural households and other groups through a disaggregation of the households sector account within national accounts, and up to the late 1980s this process was regarded as robust. The first series of published estimates were for 1956, 1962, 1965 and 1970. A second series, based on data from the national accounts for 1971, provided estimates for 1970 and 1979 (with a non-comparable set for 1975), with a further series based on 1979 data providing results up to 1983. Another series was based on 1984 data and covered 1984 to 1990. A final set was for 1990 to 1995 and was reproduced in Eurostat's 2001 report on its Income of the Agricultural Households Sector (Eurostat, 2002). This methodology was then discontinued in favour of a microeconomic approach.

The current approach to obtaining data consists of merging information from the EU labour survey, household income tax declarations (the tax register) and the French component of the EU farm accounts survey network FADN/RICA. The labour survey provides household details (the self-declared occupation of individuals, family composition) that are useful in estimating social security benefits (missing in the tax register) and providing the basis of weighting. The tax register can be used to identify all (dwelling) households that have some income from agricultural self-employment. But the forms of special agricultural taxation applied in France, particularly the existence of lump sum payments for many holdings, means that this is not a suitable source for data on actual incomes. Instead, a merging of information from FADN and household income tax declarations is undertaken. This was done for 1991, 1997 and 2003. The statistical burden of bringing the several data source together is too heavy for this merging to be done each year. It is undertaken only every six year, the next operation was scheduled for the year 2009. Judged by past performance, these results should be available by about 2013.

Using the SCEES figures for 2003 and 1997, on the basis of income per household, French farmer households in 2003 had disposable incomes per household above the all-households figure, rather more (15% higher) when medians were compared than with

[1]Text provided by Berkeley Hill, 2011.

[2]More detailed comparisons taken from tax returns are also published (using a more disaggregated list of socio-professional groups that also include a breakdown of agricultural households by size of farm) and these include households of waged workers in agriculture. However, these tax statistics carry warning about the quality of data on incomes that are not in the form of wages. Although the latest figures are for 2003, it is not clear whether the results for agricultural households incorporate merging with FADN to obtain reliable income data from farming, as feature in the rest of this results quoted in this section.

means (5%)(see Table below). This represented a deterioration from the position in 1997, when on both criteria farmer households were about one quarter higher than the national average. Taking household size into account, by using equivalence scales to express incomes per Consumer Unit, eroded the relative position of farmers because of their somewhat larger average size of household. On this basis farmer households were below the all-households position, at least in 2003; in that year the disposable income per CU of farmer households was 10% (median) or 15% (mean) lower than that of the general population. The relative position of farm households had been somewhat better in 1997; then they had average and median incomes per CU some 2 to 3% higher than the all-households figure. While a relative fall may have occurred, the volatility of incomes from farming suggests that not too much weight should be attached to movements between individual years.

FOCUS TABLE XIV.19

Disposable income per household and per Consumer Unit, farmer households and all households

	1997 €	2003 €	Percentage change 1997-2003 (%)
Per household			
Average			
Farmers' households	32,310	29,890	-1.3
All households	25,570	28,410	1.8
Farmers as percentage of all households	126.4	105.2	
Median			
Farmers	27,750	27,940	-0.1
All households	24,230	24,230	1.7
Farmers as percentage of all households	126.8	115.3	
Per Consumer Unit			
Average			
Farmers' households	16.080	15.040	-1.1
All households	15,650	17,650	2.0
Farmers as percentage of all households	103	85	
Median			
Farmers	14,110	13,920	-0.2
All households	13,830	15,480	1.9
Farmers as percentage of all households	102	90	

Source: INSEE, SCEES direction générale des impôts. Given in Olivier Guillemin and Bernard Legris (2007). *De 1997 à 2003, repli du revenu disponible et du niveau de vie des agriculteurs malgré la pluriactivité.* L'agriculture, nouveaux défis - Édition 2007. INSEE.

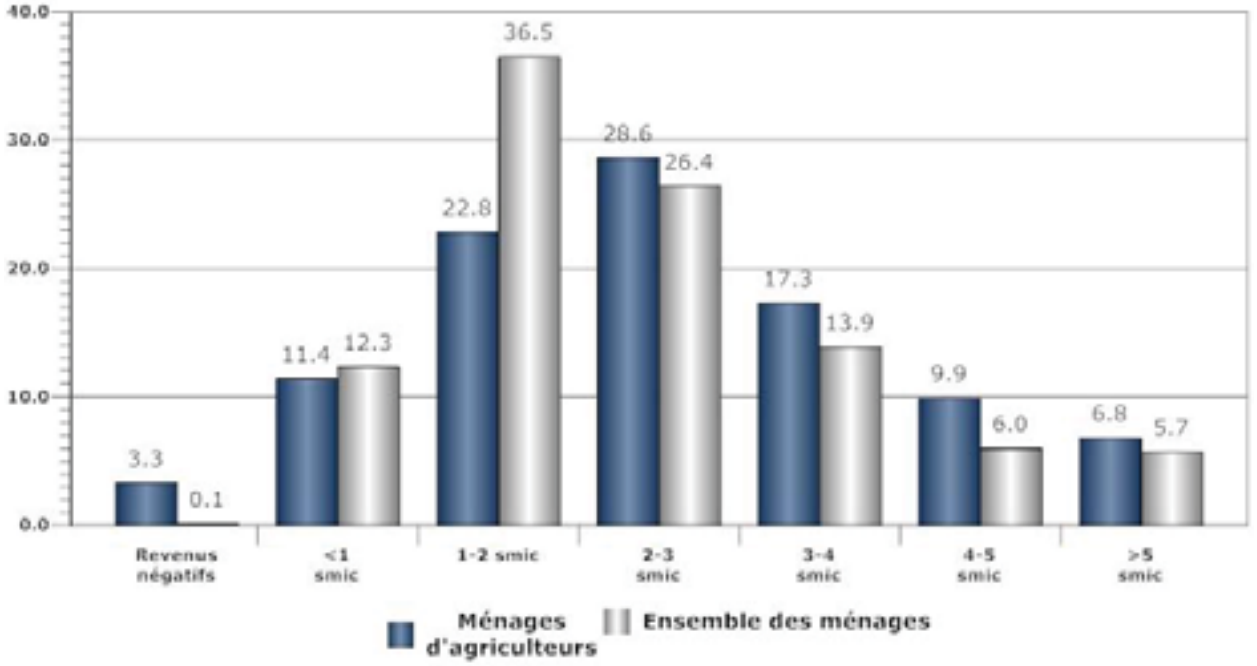
The distribution of the standard of living for farmers (disposable income per CU) is different from that of their disposable income per household. When income is expressed per household, in 2003 farmers were more numerous than the overall population among the higher levels of income (see the Figures below). However, on the basis of income per CU farmers were proportionally more numerous than the general population at the bottom of the distribution of living standards: 38% of farmers had a disposable income per CU less than the minimum wage (SMIC=1) against a quarter of all individuals. Farmers were also less likely to be found at the top of the scale of living

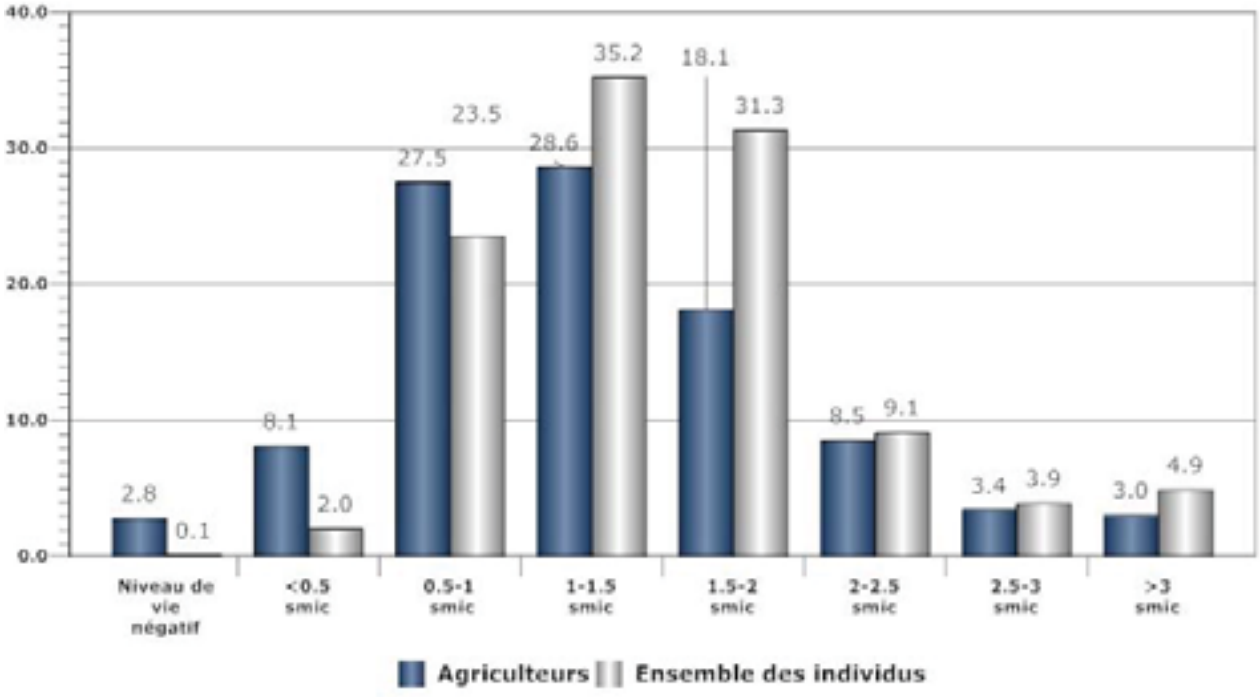
standards than when considering income per household: 15% of farmers against 18% of all households had incomes per CU more than double the minimum wage (two SMICs).

FOCUS FIGURE XIV.9
Distribution of disposable income per household and per Consumer Unit, 2003 (SMIC = minimum wage)

Upper figure - disposable income per household

Lower figure – disposable income per CU ("standard of living")





Source: Insee, Scees, Direction Générale des Impôts

FOCUS PIECES

Eurostat (2002). *Income of the Agricultural Households Sector, 2001 Report.* Eurostat, Luxembourg.

Guillemin, O. & Legris, B. (2007). *De 1997 à 2003, repli du revenu disponible et du niveau de vie des agriculteurs malgré la pluriactivité. L'agriculture, nouveaux défis - Édition 2007*. INSEE, Paris.

Focus on Income and Wealth Statistics for Ireland

The main source of data on the disposable income of households in Ireland is the periodic Household Budget Survey (HBS). These Surveys are carried out at intervals of seven years. The Household Budget Survey has been analysed on previous occasions according to the main occupation of the head of the household. Published results for 1973 and 1980 have shown the household income situation of farmers and some other socio-professional groups (including agricultural workers). The detail with which income information was collected enabled the relative importance of the various components to be assessed for various sizes of farm, and a range of income indicators to be used.

To overcome the well-known problem of under-reporting income from self-employment in agriculture, in the 1980 HBS households found to be operating farms of over 12 ha were required to keep detailed farm accounts for one year. In the 1987 HBS this was rendered unnecessary by integrating the HBS with the National Farm Survey (the survey of farm accounts that contributes to the EU Farm Accountancy Data Network (FADN/RICA). Agricultural cases were selected for the HBS from households already taking part in the HBS. Thus for these farm households there was both the detail concerning the farm business plus the additional information required by the HBS.

Results taken from the 1987 HBS were supplied to Eurostat as part of its Income of the Agricultural Households Sector (IAHS) statistics and published in various reports, including the 1992 Report and the 2001 Report, after which these statistics were suspended.

Among other things the analysis demonstrated that the definition used for an agricultural household was critical both to the number of households found and to the composition and level of income. This might be expected if a distinction is made between all households that have some income from farming (in IAHS/TIAH terminology a "broad" definition of an agricultural households) and a narrower one in which farming is the main economic activity. Perhaps less expected is the finding that there can be quite large differences between alternative ways of defining "narrow".

For example, for 1987 the use of a definition based on the **main income of the entire household** produced the smallest number of households (72,400) but the highest proportion of income from independent (mainly agricultural) activity (77%), whereas classifying on the **occupation of the head of household** found many more households (140,500) and gave a much smaller share (52%) coming from farming. It was clear that, in Ireland, classifying by the main occupation of the reference person brought into the coverage many low-income households receiving substantial amounts of social payments (including old-age pensions, as there was no automatic classification of recipients to the retired group); overall, 21% of the total income of households selected in this way was from social benefits.

Analysis presented in the TIAH 1992 Report (Eurostat, 1992) drew attention to evidence that households which were headed by a person who regarded his occupation in 1987 as being a farmer fell into two distinct groups, which were of similar numerical size. One consisted of operators mainly dependent on farming for their livelihoods (that is, their main income was from farming). The other was made up of people who called

themselves farmers but who were mainly dependent on social benefits and who had substantially lower average levels of disposable income. Among households where the head did not claim to be a farmer, the average income was greater than those that did so claim and was primarily composed of wage earnings.

In Ireland the choice of an income criterion for allocating the reference person to a socio-professional group, in contrast with an occupation criterion, clearly has an important bearing on the outcome.

FOCUS TABLE XIV.20
Number of households and average disposable income per unit for alternative definitions of an agricultural household, 1987.

CLASSIFICATION CRITERION. AGRICULTURE IS:	HOUSEHOLDS (000)	INCOME PER HOUSEHOLD (£IRL)	INCOME PER HOUSEHOLD MEMBER (£IRL)	INCOME PER CONSUMER UNIT (£IRL)
"Narrow" Definitions				
Main income of the household	72.4	12,841	3,389	4,695
Main income of the reference person (a)	84.5	12,867	3,266	4,529
Main occupation of the reference person	140.5	10,195	2,833	3,857
"Broad" definition				
A source of income of any household member (b)	206.7	10,600	2,837	3,910
"Marginal Households" (b) minus (a)	122.2	9,032	2,512	3,447
All households in Ireland		10,101	2,882	3,854

Source: Eurostat (1992). *Total Income of Agricultural Households 1992 Report*. Theme 5, Series C. Eurostat, Luxembourg. ISBN 92-826-4420-0.

So too is the choice between taking a narrow or broad view of what is an agricultural household. The Table shows that, in 1987, the average disposable income per unit (household, household member, and consumer unit) of agricultural households defined in "narrow" ways that used a main income criterion were substantially above the equivalent figures resulting from the use of the "broad" definition (where any family member drew any income from farming). This was because the households that derived some income from farming, but where it was not the main income of the reference person, (termed "marginal") had disposable incomes that were well below those of the "narrow" group (some 30% less). This suggests that, in Ireland, the "broad" definition of

an agricultural household produces a group that is quite heterogeneous in its composition.

When the incomes of agricultural households in Ireland were compared with the national all-household average, it was clear that the outcome depended very much on the definition of the agricultural household being used. Applying the TIAH target "narrow" definition (agriculture the main income of the reference person) resulted in average incomes per unit that were about one quarter to one fifth higher than the all-household figure; the premium was greatest when measured per household but was still evident on a per household member or per consumer unit basis. Among households covered by the "broad" definition, the average income level was close to the national average, showing the effect of including households with some income from farming but which failed to meet the TIAH "narrow" definition of an agricultural household; the average income of this "marginal" group was 10% to 13% below the all household average, depending on the unit over which measurement was made.

Results from the HBS

The statistics for Ireland discussed so far were the result of special calculations that enabled the definitions set by Eurostat to be respected. As supplementary information, some broad indications regarding the relative income position of farmer households can be taken from the HBS. It should be stressed that these results are not directly comparable with those given above, since different weightings are used for agricultural households. Also, and important in the light of the discussion above, the HBS classifies households on the basis of the self-declared main occupation of the reference person. On this basis farm households in the HBS were shown in 1987 as having an average income some 27 % higher than other households in rural areas, 8 % higher than urban households, and 12 % higher than the national average.

Much more recent information comes from Ireland's 2004/05 Household Budget Survey. This again, uses a link to the National Farms Survey to improve the reliability of data on the income from agriculture. A breakdown is offered by location, and rural households are further divided into farm and other households, the sample of the latter being about eight times larger than the former when weighted. **On this basis, farm households achieved an average level of weekly disposable income that was 95% of the all-Ireland average, somewhat below that of urban households but marginally above that of other rural households**. It is worth noting that the gross income of farm households was below that of other rural households, but their taxation was lower. Farmers had a substantial shortfall in their direct income compared with other rural households (€68 per household) but €23 more state transfers (of which the main component was 'farm assist').

FOCUS TABLE XIV.21
Ireland, average weekly household income (€) 2004/2005

ITEM	URBAN AREA	RURAL AREA			STATE
		Farm households	Other households	All rural households	
Self-employed (farm)	0	282	27	64	25
Self-employed (non-farm)	84	40	112	102	90
Total direct income	908	733	798	788	863
Total state transfers	126	144	121	124	126
Gross income	**1034**	**877**	**918**	**912**	**988**
Direct taxation	163	76	122	115	145
Disposable income	**871**	**800**	**796**	**797**	**843**

Source: CSO (2007). *Table 1, Household Budget Survey 2004/2005*. Central Statistics Office, Cork.

FOCUS PIECES

Eurostat (1992). *Total Income of Agricultural Households 1992 Report.* Theme 5 Series C. Eurostat, Luxembourg. ISBN 92-826-4420-0.

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Focus on Income and Wealth Statistics for Italy

This section on income and wealth statistics for Italy covers three of the four sources mentioned in the section on Italy in this chapter: the RICA-REA survey (the Italian component of the European FADN/RICA integrated with the business survey on farms, by INEA and ISTAT); the 1996 survey by ISMEA specifically directed at agricultural households, as an example of the LSMS approach for Italy; and the Survey of Household Income and Wealth (SHIW) by Bank of Italy that includes agricultural cases. The Italian EU-SILC by ISTAT, which also includes agricultural households, has been explored only on an experimental basis for the estimation of agricultural household income but it could be used regularly in the future.

1) The RICA-REA survey

(i) Overview

The RICA-REA survey is the result of the integration of the Italian FADN/RICA, conducted by the National Institute for Agricultural Economics (INEA), with the REA survey, managed by the National Institute of Statistics (ISTAT). As a result of an agreement sponsored by the Ministry of Agriculture that involves Regions and Autonomous Provinces, from 2003 just one national survey is conducted within the Italian National Statistical System (SISTAN).

The REA survey is the business survey for the agricultural sector in Italy that investigates the economic results of farms and the off-farm income of households involved in agricultural production[1]. This survey has been managed by ISTAT since 1997. The statistical information produced meets the needs of the National Accounts unit in ISTAT to satisfy the requirements of the European System of Accounts (ESA95) and to estimate agricultural household income. With the REA survey, economic aggregates of the agricultural sector have been directly estimated on a farm basis for the first time, paving the way for a comparison with economic results of industrial and services firms. More accountancy information on large farms (that means over a certain size) is collected by FADN/RICA. Moreover, since the present survey is harmonised with the Farm Structure Survey (FSS), it is possible to integrate physical and monetary variables at the microeconomic level and to analyse farms' performances in relation to their structural characteristics. Finally, with the micro-data from the survey it has been possible to investigate, for the first time, the multi-functionality of farms and their socioeconomic and environmental sustainability.

This survey is an example of how official needs for information at the macro-sector level can be combined with the increasing demand for statistical data at the micro–farm level. The result has been achieved through an institutional agreement inside the Italian public administration, and has involved those public research institutes with interest in the subject.

[1] http://www.istat.it/strumenti/rispondenti/indagini/rea/
www.istat.it/strumenti/rispondenti/imprese/ricarea/ricarea02.htm

(ii) Survey characteristics

REA is an annual survey, carried out through face-to-face interviews on a random sample of farms. Data are collected at the regional level by FADN/RICA, under the statistical responsibility of ISTAT.

The reference population, for estimation purposes, is the national population of farms of any type and size, including exclusively zoo-technical farms. Since the 2002 reference period, the observation field has been restricted to the so called European Union (EU) field, that excludes micro-farms with less then € 2,066 of sales or farms with under one hectare of Agricultural Area Utilised (AAU).

The sample in the 2004 reference year contains about 25,000 farms and, following a panel criteria, is partially renewed over time. It is extracted from the database generated by the General Census of Agriculture which is updated by annual sample surveys.

(iii) The REA questionnaire

An innovative questionnaire has been introduced for the REA survey. Information is collected on the main economic characteristics of the farm and the holder's household with only a limited number of questions. Data are collected on:

1. Costs;
2. Revenues of the farm by kind of activity (principal and secondary activities);
3. Self-consumption by the household of the holder;
4. Consumption of farm products as inputs;
5. Stocks of input materials and products at the start and at the end of the reference year;
6. Buying and selling of capital goods;
7. Public and Common Agricultural Policy (CAP) subsides;
8. Employment and labour cost of employees;
9. Holder and holder’s household;
10. Off-farm income of the household members.

The REA questionnaire is just four pages long, with the first page dedicated to the analysis of costs: inputs for cultivation and animal breeding, energy consumption, administrative and functioning costs, interest payments and direct taxes on goods and agricultural production. In this respect, REA forms a specific survey on costs necessary to compile the Italian input-output table.

An important section of the questionnaire is devoted to the structure of the holder’s household and the income sources of its components. The overlapping of a unit of economic activity (the farm) and a unit of consumption (the household) allows a double level analysis: the farms' economic performance together with the income distribution within households that are involved in agricultural production and have direct management of the farm.

(iv) From micro to macro estimates

Data on sampled farms allow estimations at different levels of aggregation: from different typologies of farms and households (by size class, kind of activity, geographical location, income sources, types of farming, etc.) up to the whole agricultural sector.

An example of national accounts aggregates estimated with the REA survey is shown in Focus Table XIV.22. Focus Table XIV.23 (a) and XIV.23 (b) are examples of analyses at the farm level of the income structure of the household and the opportunity for income brought about by multiple activities.

FOCUS TABLE XIV.22
Farms Economic Results (a) – Years 2002

ECONOMIC VARIABLES	Farms	Farms with more than 5 ha	
		Absolute values	%
	Absolute values (*thousand of units*)		
Farms (b)	1,838	459	25.0
AWU (b)	1,295	641	50.0
Dependent AWU (b)	164	126	76.8
	Absolute values (millions euro)		
Production (c)	32,095	24,383	76.0
- *Turnover*	27,232	20,542	75.4
Intermediate costs	13,772	10,479	76.1
Value Added (c)	**18,323**	**13,904**	**75.9**
Labour cost	2,412	1, 935	80.2
Gross Operative Margin (GOM)	**14,911**	**11,969**	**75.2**
Other net profits	619	317	51.2
Social contributions due on holder and household members who work in farm	1,333	833	62.5
Gross Management Result (GMR)	**15 197**	**11,453**	**75.4**
	Average farm values (*units*)		Ratios
AWU (b)	0.8	1.4	1.8
Dependent AWU (b)	0.1	0.2	2.0
	(*euro*)		
Production (c)	17,474	53,090	3.0
- *Turnover*	14,826	44,727	3.0
Intermediate costs	7,498	22,817	3.0
Value Added (c)	**9,976**	**30,272**	**3.0**
Labour cost	1,313	4,214	3.2
Gross Operative Margin (GOM)	**8,663**	**26,059**	**3.0**
Other net revenues	337	691	2.1
Social contributions due on holder and household members who work in farm	726	1 813	2.5
Gross Management Result (GMR)	**7,274**	**24,937**	**3.0**

(a) Only individual and corporate farms.

(b) Total labour input in agriculture measured in Annual Work Units (AWUs).

(c) Basic prices values.

Source: ISTAT – *Business Survey on Farms* (REA).

FOCUS TABLE XIV.23(a)
Income and Employment in Farms Directly Managed by the Households by Classes of Utilised Agricultural Area (UAA) – 2002

CLASSES OF UAA (HECTARES)	Households with a direct management on farm and with off-farm incomes (%)					Number of household members working in farm (average by farm)	GOM per household member working in farm (euro)
	Total	With income from self-employment	With employment income	With pension income	With capital income		
Less and equal 1	84.2	18.8	36.9	47.0	1.0	2.0	619
1-5	74.4	16.5	29.5	45.7	2.2	2.1	1,788
5-20	59.5	14.3	21.4	37.7	1.1	2.1	6,158
20-50	49.1	15.8	15.4	24.9	1.8	2.3	16,925
More than 50	32.2	7.8	11.0	20.0	4.6	2.4	25,382
Total	**72.9**	**16.7**	**29.5**	**43.2**	**1.6**	**2.1**	**3,535**

Source: ISTAT – *Business Survey on Farms* (REA).

FOCUS TABLE XIV.23(b)
Composition of Total Income of Households Managing Mono- and Multi-active Farms by Income Source and by Classes of Utilised Agricultural Area (UAA) – 2002 (%)

Classes of UAA (hectares)	Income source						
	Agricultural activity in the strict sense	Secondary activities connected to agriculture	Self-employment	Employment	Pension	Capital	Total
Households managing mono-active farms							
Less and equal 1	21.8	-	14.9	32.9	29.5	0.9	100.0
1-5	37.6	-	10.8	23.4	27.3	1.1	100.0
5-20	71.5	-	5.9	10.5	11.8	0.2	100.0
20-50	91.2	-	2.1	2.8	3.5	0.4	100.0
More than 50	96.9	-	0.9	0.9	1.0	0.2	100.0
Total	**57.6**	**-**	**8.0**	**16.5**	**17.4**	**0.6**	**100.0**
Households managing multi-active farms							
Less and equal 1	20.4	34.2	9.1	15.6	18.2	2.5	100.0
1-5	37.5	28.5	8.7	9.6	15.6	0.1	100.0
5-20	55.4	27.3	2.2	6.5	8.0	0.6	100.0
20-50	68.1	24.1	1.8	2.4	3.0	0.6	100.0
More than 50	74.7	22.5	0.7	0.8	1.2	0.2	100.0
Total	**56.5**	**26.3**	**3.5**	**5.6**	**7.5**	**0.6**	**100.0**

Source: ISTAT – *Business Survey on Farms* (REA).

(v) Conclusions and recommendations

This section suggests some potential uses of RICA-REA micro-data. A business survey similar to REA can be a suitable tool for micro and macro analysis applied to agriculture. Nevertheless, some conditions have to be satisfied in order to establish a reliable and useful database without significantly increasing the response burden for agricultural holders:

- business surveys should include farms without a relevant amount of agriculture production but important for rural development monitoring;
- business surveys should be carried out on a random sample of farms to avoid significant bias due to voluntary based sample design;
- business surveys and structural surveys should be coherent with respect to the definitions of statistical units and a common set of structural variables used to obtain consistent estimates;
- in the case of non-overlapping samples, the business survey must collect a minimum set of structural variables useful for calibration of estimations on the structural survey results and for microeconomic analysis.

2) The ISMEA survey

(i) Overview

The Institute for Services in Agriculture and Agro-food Markets (ISMEA) survey not only provides data on production practices and resource use in agriculture, but also the information needed to model farm-household behaviour. The survey undertaken in 1996 was designed in collaboration with the *Microsimulation-Unit* of the University of Verona[2] and fulfilled the mandate under which ISMEA had to build an agri-food Input/Output (I/O) table. In addition, the data provided essential information to policymakers (at the regional, national and Communitarian levels) and agricultural organizations for designing and judging various policies and programmes that touch the farm sector or affect farm families. The provision of this information was also part of the policy mandate of ISMEA. The aim of this section is to provide a detailed description of the ISMEA survey and to discuss its utility with regard to monitoring the living conditions of the rural and farm population.

(ii) The survey

The ISMEA survey was designed to collect statistical information on the behaviour of each member of the agricultural household and on the way that public and private resources were shared within the household. This would permit an empirical analysis of the household decision-making process with regard to these resources. In general, production, consumption and labour supply decisions are usually analyzed separately in terms of the behaviour of producers, consumers, and workers, respectively. Agricultural households integrate all these usually separate decision-making units within a single institution. Therefore, it makes sense to analyze the linkage between income, consumption and labour supply within farm households.

[2] http://pilar.univr.it/Microsimulation-Unit/progetti-in-corso/inchiesta-ismea95.htm

(iii) The sample design

The ISMEA survey was a probability weighted, stratified survey (by European Size Unit [ESU][3] and Farm Type[4]) that collected information from 1,881 farms, 1,777 of which were household farms[5]. Appropriate sample weights (expansion factors) were available so that estimates for the entire population could be determined from the survey results.

The collection units were farms, defined in official statistics as economical-technical units composed of land (even if not contiguous), plant and tools, and where agricultural, animal and forestry production is undertaken by a person, company or agency which bears the risks.

Sampling was based on the Agricultural Census conducted in 1991 by the Italian National Statistical Institute (ISTAT). Farms below an economic size of 4 ESU were excluded. This removed enterprises where the agricultural activity was either marginal or negligible. The universe was divided into 15 main farm types and three ESU classes on the basis of census results. The sample was statistically representative at the macro-regional level (North, Centre and South).

(iv) The questionnaire

The objective of the ISMEA survey was to gather data about both the farm and the household that could be used to assess the structure and the behaviour of the farm. Further, it was designed to evaluate the effects that various agricultural and rural policies had on household behaviour and welfare by using a collective household approach[6]. Accordingly, a multi-topic questionnaire was designed to collect data on several dimensions of farm and household well-being, including consumption at the individual level, income, savings, financial wealth, governmental and intra-household transfers, education and housing (see Focus Table XIV.24).

The design of the ISMEA questionnaire was inspired by those in use for farm production data collection (for example that used by the FADN/RICA- farm production), those on the consumption of household members (such as the one used by ISTAT), by the EU labour force survey and by the questionnaire used by the Bank of Italy to collect data on

[3]The European Size Unit (ESU) is the indicator used by FADN to measure the economic dimension of a farm. It is based on the standard gross margins (SGM) attributed to the farm, that is on the potential gross margins producible in a farm with given structural characteristics. In 1995: 1ESU = 1200 Ecu = 920.95 euro.

[4]The classification of farms into types is based on the financial potential of the various agricultural activities of the farm and the combination of these activities.

[5]The size of the ISMEA survey is in line with the indications given by the Living Standards Measurement Study (LSMS) of the World Bank. The LSMS surveys tend to use small samples, often in the order of 1,600 to 3,200 households and rarely more than 5,000 households. Although larger samples would have smaller sampling error, it was judged by survey designers that non-sampling errors would increase more than concomitantly.

[6]That is, using models that explicitly take into account differing resource allocation decisions amongst the individuals of the same household.

household incomes. The final result was a set of questions very close to those suggested by the LSMS[7] to assess the welfare of rural households.

(v) Production and factor use information were structured by activity

A peculiarity of the ISMEA survey was that, in contrast to the questionnaire used by the FADN/RICA, the sections on production and on factor use were structured by activity. This level of detail was needed to build the Input/Output table of the agricultural sector.

(vi) From the farm operation to the farm household-firm unit perspective

Another important characteristic of the ISMEA questionnaire was that the attention shifted from a traditional farm operation perspective to a farm household-firm unit perspective. For example, information on the social characteristics (gender, age, level of education, professional characteristics, etc.) not only of the farm operator but of all family members was collected. In addition, the questionnaire contained a stylized time sheet[8] describing how much time each family member devoted to activities such as on- and off-farm work, household work, child care and pure leisure time. This type of information was very useful when the work roles and off-farm labour participation of different members of the family were analyzed. In addition, the data gathered in the time budgets were also essential for estimating the full and extended household income (see Chapter X for a discussion of these concepts).

(vii) An agricultural standard of living survey

The ISMEA survey was designed to provide the information needed to assess not only the economic impact of policy programmes at the farm level, but also the socioeconomic impact at the farm-household level. In other words, the survey was designed to assess the impact policy programmes had on the standard of living and economic welfare of farm households. In order to facilitate this, a module of questions gathering information on the quality of life and on other characteristics of farm households was added.

The first group of questions concerned housing characteristics. The responses were used to infer the standard of living of the agricultural household. The second group of questions collected detailed information on household consumption: the consumption of food, either bought from the market (recording both quantity and price) or grown on the farm, and the consumption of both semi-durable and durable goods (distinguishing between children and adult goods). Measurement of consumption was emphasized in the questionnaires because this kind of information allows a better estimate of household economic welfare than does information on income.

The first part of the questionnaire was complemented by a module containing questions on the intra-household decision making process for both farm and household decisions with regard to household goods, intra-household transfers, subjective measures about the risk associated with future investments in agriculture and intentions about the

[7]The Living Standards Measurement Study, which was established by the World Bank in 1980.

[8]The time sheet is comparable to that used by ISTAT in the "Multiscopo survey" and in the Communitarian survey on time budgets conducted by Eurisko.

future development of the farm. This information, not usually available in the traditional agricultural statistics, proved to be very useful, for example, in addressing problems such as modelling the intergenerational succession of household farms, or the on- and off-farm labour decisions within the farm household.

The collection of data on household welfare was completed by a group of questions on household income (comparable to the survey on household income conducted by the Bank of Italy and by the European Community Household Panel), savings and financial investments of the family.

Focus Table XIV.24 shows that the ISMEA survey incorporated much of the information on the household that was suggested by the LSMS to analyze the quality of life of households. The information gathered by the ISMEA survey allowed analysis of the standard of living of agricultural households. It is easy to see that information on non-farm enterprises run by the household members and on the services they use is required to facilitate the study of living standards, not only of agricultural households but of all rural households.

FOCUS TABLE XIV.24
Modules in the ISMEA survey

Module	Respondent	Subject
Section I : "General information about the household"		
Tenure, legal status, structural and other characteristics of the farm	Best-informed farm member	Tenure, owned and rented land, physical size, altitude, etc.
Section II: "Characteristics of the households and labor organization"		
Information on the family	Best-informed family member	Social characteristics (gender, age, level of education, professional characteristics, etc.) and hours of labor worked by the household members
Information on wage workers (fixed and temporary)	Best-informed farm member	Gender, hours of labor worked in high and low season, gross monthly wage by qualification
Section III: "Commercialization"		
Purchase of inputs and sales of farm products	Best-informed farm member	Product marketing and institutional arrangements
Section IV: "Production"		
Crops, livestock and products of livestock.	Best-informed farm member	Quantities produced, self-employed and processed products, stocks, sales and prices, premiums and subsidies.
Other farm revenues	Best-informed farm member	It collects information on farm revenues different from the sale of agric. products (machine hiring, custom work, land rents, production contracts, agritourism, insurance payments, etc.)
Section V: "Factor use"		
Inputs and labor used for crops and livestock	Best-informed farm member	Cash expenditure for inputs (fertilizers, other chemicals, seeds, feeds, water, oil and insurances) by activity and number of hours worked by family members, waged workers and machines.
Labor cost	Best-informed farm member	Salaries paid
Other expenses	Best-informed farm member	Overheads, environmental, etc.
Section VI: "Investments and financial activities"		
Land and investments	Best-informed farm member	Value of land capital and investments
Credits	Best-informed farm member	farm credits by type
Debts	Best-informed farm member	debts and loans by type

Module	Respondent	Subject
Section VII: "The Household"		
Housing characteristics	Best-informed household member	Type of dwelling. Durable goods owned (cars, televisions, bicycles, sewing machines, etc.) and percentage of use in the farm and in the household.
Time use	Head of household / principal respondent	On and off farm labor time per member of the household and time spent to reach the workplace by means of transportation. Sector of activity and expected reserve wage in agriculture or in other sectors.
Household consumption	Best-informed household member	
Annual consumption		List (value of durable goods distinguishing between children and adult goods)
Monthly consumption		List (value of semi durables goods)
Weekly consumption		Food quantity and prices of bought food and self-consumption.
Responsibilities and intrahousehold decision	Best-informed household member	Who decide in farm, in family and out of farm. Separated Income between Wife and Husband.
Household goods	Best-informed household member	Hh header growths in farm. Time spent in family. Sons in Farm. Farm inheritance and farm legacy.
Intra-Household transfers	Best-informed household member	Gifts, inheritance, familiar loans.
Other information about the farm and the household	Best-informed farm member	Technology, bookkeeping. Subjective measures of risk, intentions about the future development of the farm.
Income and savings	Best-informed household member	Monthly global household income and wife's Income Contribution; number of pensions preceptors and range of perceived pension; annual savings and investment in accounts, bonds, shares, financial funds.

3) Two Surveys of Household Income, Wealth and Living Conditions

Micro-data collected in the national Survey of Household Income and Wealth (SHIW) by the Bank of Italy and in the Household Budget (EU-SILC) by ISTAT can be of help in analyzing the economic well-being of rural and agricultural households. Moreover, this micro-data can help to identify those individuals or households groups, within the rural community, which have a low enough standard of living to be potential beneficiaries of rural and agricultural policies aimed at alleviating poverty.

A) SHIW by Bank of Italy: a Study on Agricultural Household

In this section, a distributive study of income, consumption and wealth of Italian agricultural and rural households, based on SHIW data, is presented.

(i) The data

The following analysis relies on data from the Historical Archive (HA) of the SHIW, covering the years 1995, 1998, 2000 and 2002. The survey was originally designed to collect data on incomes and savings. However, over the years the range of data collected expanded to the extent that wealth (both in terms of real assets and financial assets) and other information relevant for analysing the economic and financial behaviour of Italian households became available. Presently the sample covers more than 8,000 households and 21,000 individuals.

The variables used to analyze the economic situation of the households are income, consumption and wealth. Household income comprises income from work (whether as an employee or self-employed), pensions, public assistance, private transfers, income from real properties, the imputed rental income from owner-occupied dwellings, and interest on financial assets net of interest paid on mortgages. All components are recorded net of taxes and social security contributions. Household consumption is given by the sum of expenditures on durables (transport equipment, furniture, etc.) and non-durables goods. Household wealth is calculated from the sum of real (property, companies, and valuables) and financial assets (deposits, government securities, equity, etc.), net of financial liabilities (mortgages and other debts).

In the following analysis, all the economic variables are expressed in constant 2000 prices, using the consumer price index as the deflator. Observations are weighted by using adjusted weights, available in the HA, obtained by post-stratifying the samples to re-establish the marginal distributions of components by sex, age group, type of job, geographical area and the demographic size of the municipality of residence, as registered in population and labour force statistics. These weights provide greater stability when comparing results from different years.

Rural and agricultural households

So far a common concept of what constitutes a rural area has not been developed at the EU level. To collect statistics on the main economic, social and environmental features of rural areas, though, we need to have an approximation of the area defined as rural and which may, therefore, be the recipient of rural policy. Following the example recently given by the European Commission, the OECD definition that identifies local areas (municipalities) as rural if the population density is below 150 inhabitants per square kilometre was applied. This definition has proven to be useful in making international comparisons of rural conditions and trends. Unfortunately, this information on the population density of the municipality in which households in the SHIW reside is available only for the year 2002. For the purposes of this section, this group is called the *Rural Household Group.*

In addition to this rural household group, two other groups of households have been identified. Both of these have strong agricultural involvement.

The first group encompasses those households that are identified by applying the so-called "broad" definition of an agricultural household. These are those households that derive some income from *independent activity in agriculture* (other than income solely in kind). This income can arise from activity of the head of household or any other member (see Chapter IX of this Handbook for a fuller discussion of the definition of the agricultural household-firm). For simplicity, this group is called the *Farm Household Group*.

In Italy, around 40% of the total agricultural workforce is composed of salaried workers. In countries with a high share of salaried workers in agriculture, like Italy, it is important to monitor not only the economic situation of the farm households but also that of the agricultural wage worker households.[9] As a consequence, a second group of agricultural households have been identified, comprising those households that derive some income from salaried activity in agriculture. This group is termed the *Agricultural Dependent Household Group.*

(ii) Economic conditions of rural and agricultural households

The sample sizes of the three groups of households identified above (the farm household, the agricultural dependent household and the rural household) is shown in Focus Table XIV.25.

The top three charts in Focus Figure XIV.10 show the evolution from 1995-2002 of the levels of three variables (income, consumption and wealth) for five groups of Italian households. These household groups are:

- Total households
- Total self-employed households
- Rural households
- Farm households
- Agricultural dependent households

The last three are those groups previously defined. By combining these household groups into one chart, visual comparisons can easily be made. Note that data for rural households are only available for the year 2002.

It can be seen that the agricultural dependent households are disadvantaged relative to the other household groups. They record the lowest values on all three variables of income, consumption and wealth for every year of the study period. Conversely, farm households are better off than the Italian average household on all variables, with the largest difference being in the wealth category. This confirms the results of previous analysis (ISTAT, 1998; Eurostat, 1998). It is interesting to note that farm households appear to be better off even than the Italian self-employed group for some years of the

[9]On average, the share of salaried workers within the total agricultural work force in the EU25 is around 24%. Apart from Italy, EU countries in which salaried work is particularly important are the Czech Republic (78%), Finland (78%) and Slovakia (55%). In addition, in Denmark, Germany, Spain and the Netherlands salaried workers constitute more than one third of the total labour input to agriculture.

study period (and for wealth they are better off in every year). An additional characteristic of the farm households is that they have a higher variability than in the rest of the household groups for all the variables. This is mainly due to unpredictable weather and the biological risks inherent in agricultural production. A final feature of farm households, mentioned earlier, that should be emphasised is that they show levels of wealth much higher than the rest of the Italian households. This is mainly due to the ownership of physical farm assets, the most important of which is the ownership of land.

The 2002 data of rural non-agricultural household type shows results that are very close to the average Italian household for all the variables.

The last two charts in Focus Figure XIV.10 show the results for the income and consumption variables in adult equivalents. In order to perform inter-household comparisons, as it is usually done when a poverty analysis is undertaken, we need to convert households differing in size and composition into adult equivalents (see Chapter IX). This conversion has been done by applying the OECD modified equivalence scale[10]. Distribution is thus measured across adult equivalents, attributing to each person the equivalent income and consumption of the household to which he or she belongs.

It is interesting to note that when differences in household size and composition are taken into account, the differentials among income and consumption levels of the farm and non-farm household types tend to shrink.

However, the relative disadvantage of the agricultural dependent households observed previously is confirmed even when differences in household size and composition are accounted for. Conversely, the relative position of the rural household type worsens both in terms of income and consumption. Finally, it is interesting to note that in terms of both income and consumption, farm households are no longer better off than the self-employed household group in most years.

Inequality and poverty

A summary statistic that can be used to characterize the distribution of incomes within a group is the Gini coefficient (or index) (see Chapter XI for a fuller explanation of the Gini coefficient). The higher the Gini index, the more unequal (or more concentrated) is the distribution. In this section, the Gini index is used to analyze the distribution of the three economic variables within each household group.

The data reported in Focus Figure XIV.11 show that the large variability previously observed in the *levels* of income and consumption in the farm household group is matched by a large variability in the distribution of these variables. Due to the extreme fluctuations it is difficult to define the relative position of farm households in distributive terms. For example, the concentration of their income is approximately equal to the other household groups in 1998 and 2000 but is much higher in 1995 and 2002. In terms of consumption, the concentration of distribution is higher in the farm household group than all others for every year of the study period. This pattern is even more pronounced when the size and composition of households is taken into account

[10]This scale assigns value 1 to the first adult, 0.5 to any other person aged 14 or older and 0.3 to any person younger than 14.

(as shown in the "Equivalent consumption" chart). Apart from 1998, farm households' wealth concentration is lower than in the rest of the household groups. Finally rural households present a lower concentration of both equivalent income and equivalent consumption (i.e. when the size and composition of households are taken into account) relative to the rest of the population.
In order to measure the incidence of poverty a poverty line must first be established. A poverty line is the minimum standard of living achieved before a person or household is no longer deemed to be "poor". For the purposes of this section, the poverty line has been set at 50% of the median equivalent income.

Focus Figure XIV.12 shows the proportion of households in each household group that fall below the poverty line. Apart from the agricultural dependant household group, the data show that the incidence of poverty is more or less the same across the different household groups. Moreover, the incidence of poverty tends to decrease over the study period. Over the period, the proportion of the agricultural dependant household group below the poverty line appears to have been higher than the rest of the groups under analysis, in some years more than double. However, this finding should be treated with caution, as the costs of some important consumption items may be lower for farm households (though for others it may be higher).

The effect of relatively high income variability in the farm household group can be seen in this index. In 2000, the fall in farm household income, mainly due to the fall in farm net income, manifested itself in a rise in the poverty rate amongst this household group to 23.4%.

(iii) Conclusion

This section has demonstrated how the data collected in national Household Budget Surveys can be used to perform distributive analyses of the rural and agricultural population. By making use of data on income, consumption and wealth, the relative position in terms of economic well-being of different household groups can be assessed and the possible presence of poverty or low income detected.

An advantage of Household Budget Surveys in regard to activity-specific data sets is that the economic situation of rural and agricultural dependent households can be studied and monitored and directly compared to that of farm households. This is particularly important for Italy with its relatively high share of agricultural dependent households.

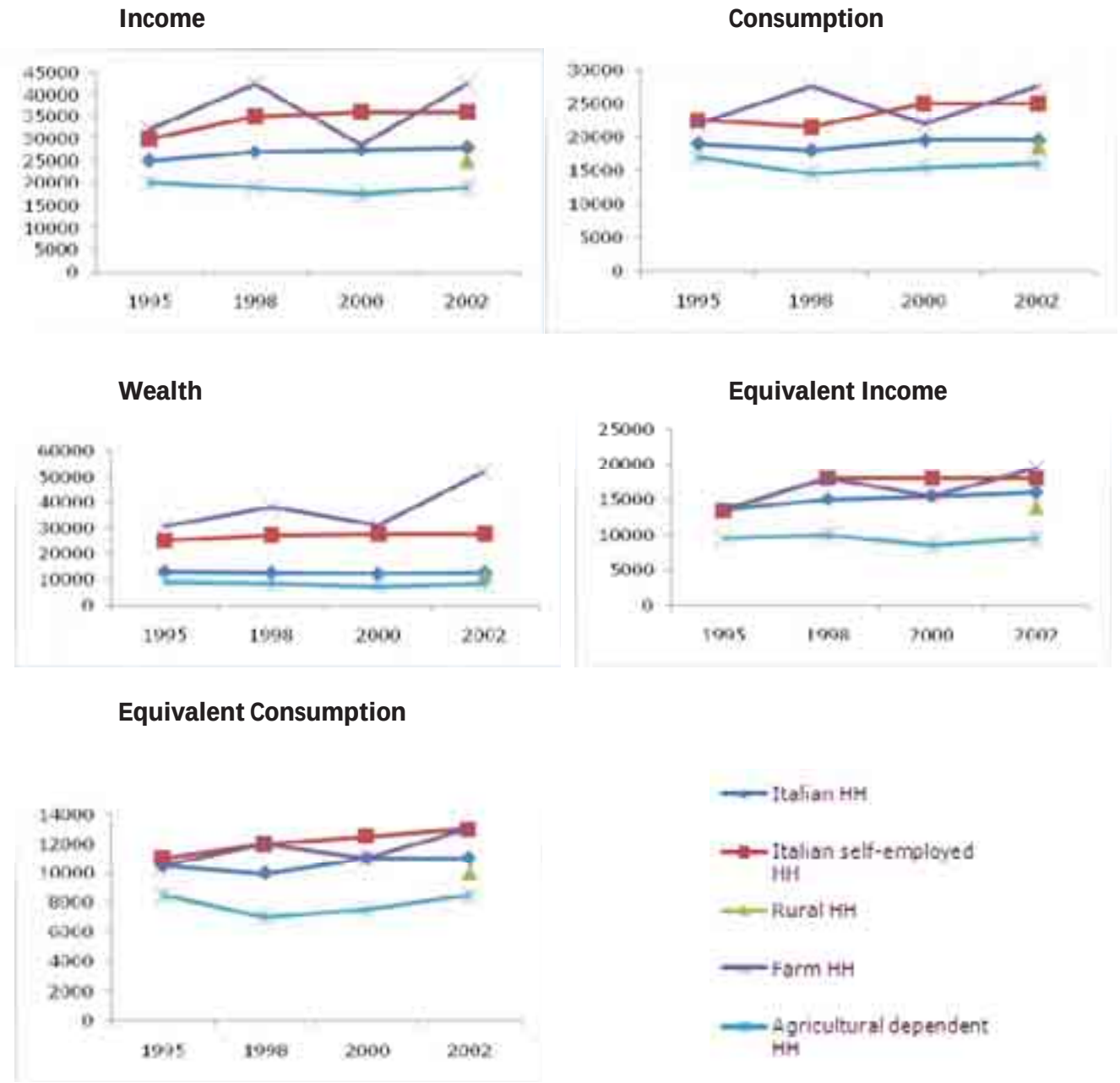
There are, however, some limitations imposed by the use of Household Budget Surveys. The most important limitation is that Household Budget Surveys do not provide information on the type of farm business run by the household. As a consequence, while the overall economic well-being of farm households can be monitored, it is not possible to detect the impact that specific farm business types have, for example, on low income or poverty among that group.

FOCUS TABLE XIV.25
Italian households and individuals by household type

	1995			1998			2000			2002		
	HH	%	Individ.	HH	%	Individ.	HH	%	Individ.	HH	%	Individ
Household type												
Farm	144	1.77	557	78	1.09	290	124	1.55	441	113	1.41	401
Agr. Dependent	132	1.62	495	155	2.17	589	192	2.40	691	192	2.40	634
Rural non agricultural										1,111	13,9	3,049
Total population	8,135	100	23,924	7147	100	20901	8,001	100		8,011	100	21,148

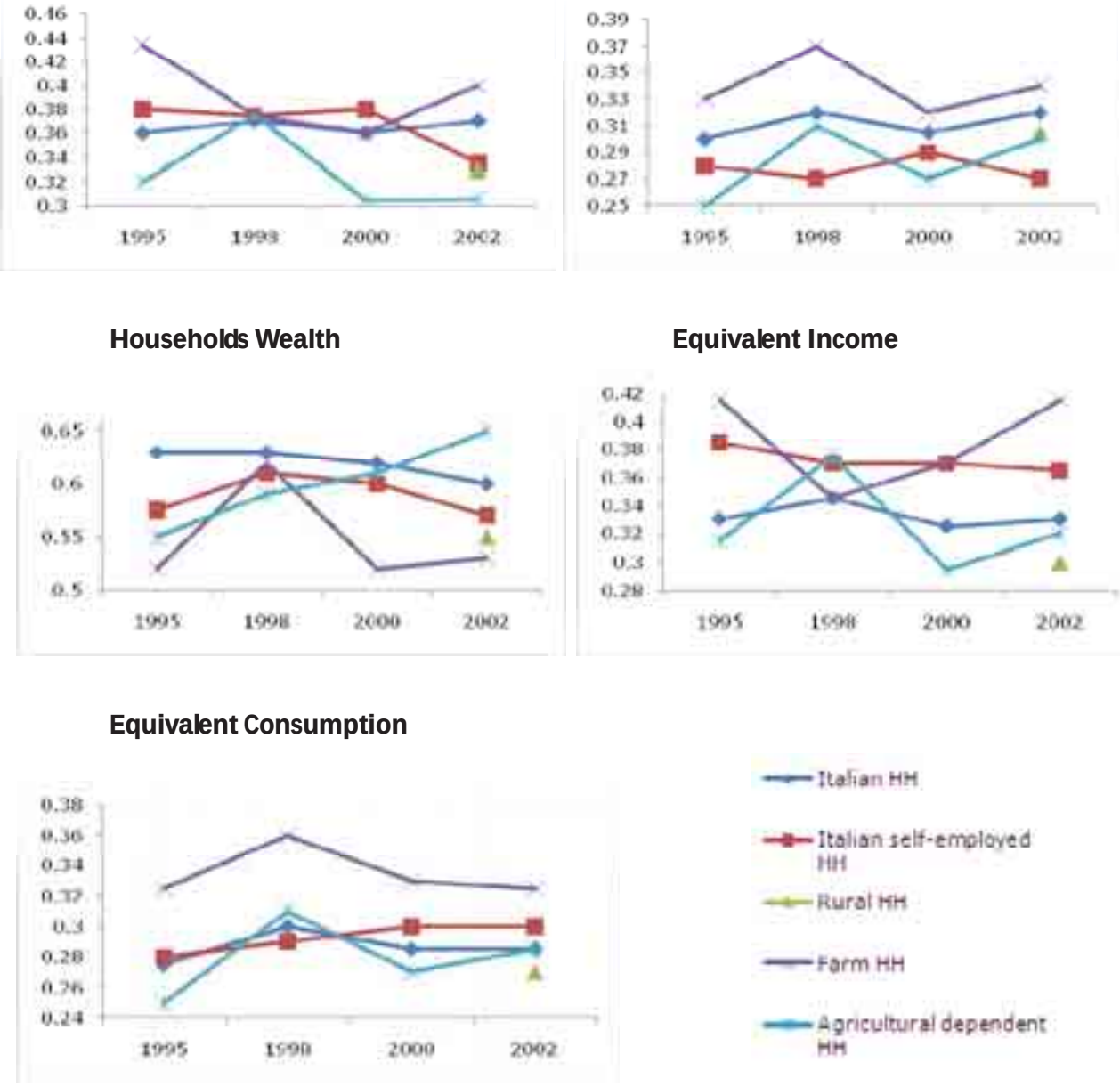
Source: Salvioni and Colazilli (2005)

FOCUS FIGURE XIV.10
Household and equivalent income, consumption and wealth, Italy,1995 to 2002



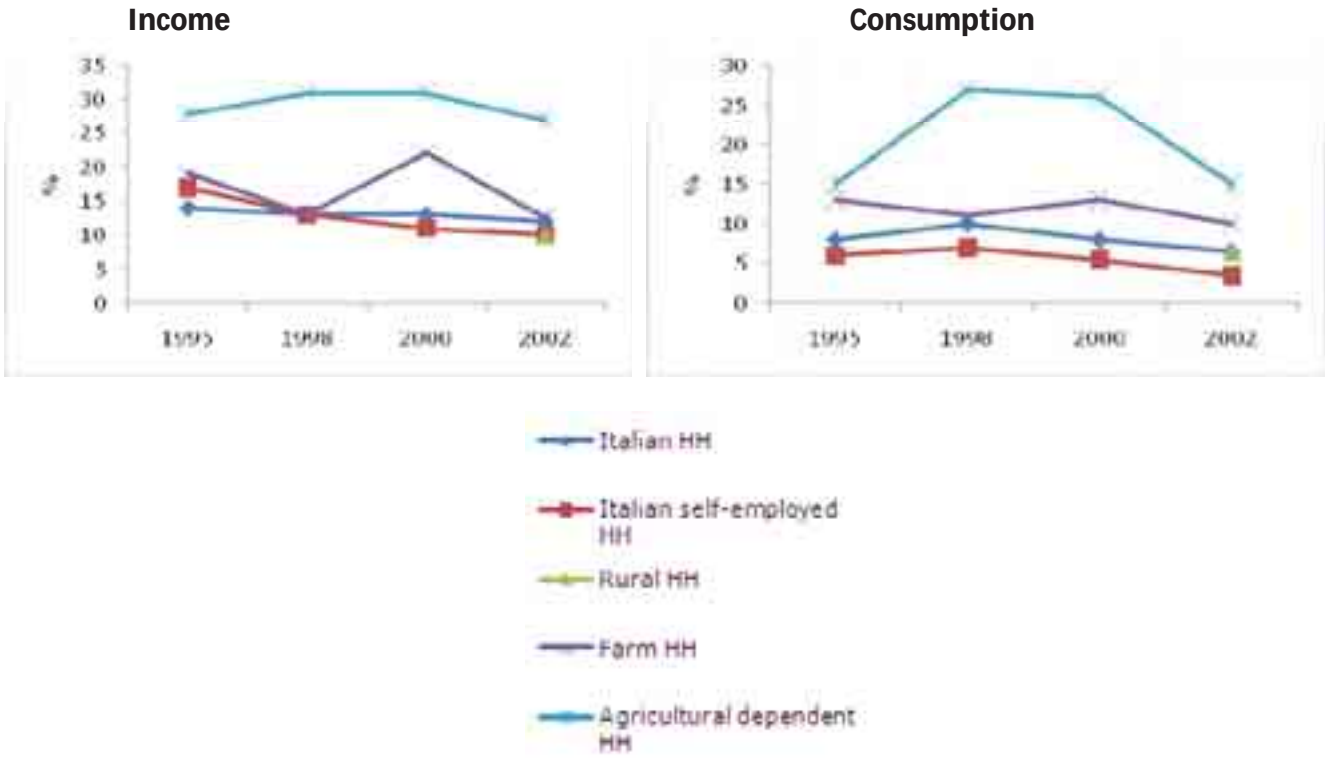
Source: Salvioni and Colazilli (2005)

FOCUS FIGURE XIV.11
Gini index on household and equivalent income, consumption and wealth, Italy, 1995 to 2002



Source: Salvioni and Colazilli (2005)

FOCUS FIGURE XIV.12
Headcount ratio on household and equivalent income and consumption, Italy, 1995 to 2002



B) EU-SILC by ISTAT

(i) The survey in European Union and Italy

The EU-SILC survey (Statistics on Income and Living Conditions) is the main source of micro data in EU countries about income at very detailed component level and living and social conditions, with the aim to provide data for comparable indicators using harmonized definitions and methodology. The EU-SILC is a compulsory annually survey regulated by EC Regulation n. 1177/2003 of the European Parliament and of the Council. This instrument is anchored in the European Statistical System (ESS) and substitutes the former European Community Household Panel (ECHP). The EU-SILC in Italy is carried out by ISTAT.

The survey started in 2004 for EU-15 (with the exception of Germany, the Netherlands and the United Kingdom, which had derogations until 2005), as well as for Estonia, Norway and Iceland. In Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia this survey started in 2005. Meanwhile the EU-SILC has also been implemented in Bulgaria, Romania, Turkey and in Switzerland from 2007. Implementation in Croatia is being discussed.

The EU-SILC collects data at household level as housing condition and social exclusion while labour, education and health information are collected at the level of the individual. The survey provides two types of data: cross-sectional data pertaining to a given time or a certain time period with variables on income, poverty, social exclusion and other living conditions; longitudinal data pertaining to individual-level changes over time and are observed over a four year period.

Although the Regulation asked for the production of national indicators, in Italy the survey has been designed also to produce affordable indicators at regional level. From 2007 the estimate of gross income allowed the computation of socio-economic indicators before and after taxes and social transfers.

(ii) The sample design

The reference population in EU-SILC includes all private households and their current members residing in the territory of the countries at the time of data collection. The statistical unit is the household and all household members are interviewed if older than 15 (16 in rest of Europe) in the reference period. The latest available EU-SILC (year 2008) includes 20.928 households with 52.433 individuals.

The sample is designed by Eurostat. The selection framework of the sample units is complex. Municipalities are split in two sets according to their population. One set contains all the main municipalities according to a population threshold: the elements of this set are called auto-representative (AR). The second set contains the rest of not auto-representative (NAR) municipalities. In the AR set, from each municipality a list of households is systematically extracted from the local registry office. In the NAR set, the municipalities are in proportional probability with respect to their demographic dimension and the households are also systematically extract from the registry. The AR and the NAR are stratified according to their demographic dimension and under some conditions: to select at least four municipalities in every strata of NAR, to select a minimum number of households (24) to be part of the sample and to form strata with same size.

Eurostat set the minimum number of households and individuals of sample: Italy has a sample size of 12.750 households with at least 27.250 individuals. In addition Eurostat set that the longitudinal component has to be 75% of the sample size. The longitudinal components of the survey is a rotation panel of 4 years. Thus household in every year can be divided into four parts. The households who are interviewed for the first time, households who were interviewed the previous year, households who were interviewed the two previous years, and households being interviewed for the last time.

(iii) The questionnaire(s)

The questionnaire design has had a long period of testing and undergone improvements which aim to reduce respondent burden, in this way lower non-response, reduce under-reporting behaviours, improve clarity of questions, and improve the structure and content of the questionnaire. The EU-SILC framework includes four different forms.

The first form is pre-filled and contains information about the household that the interviewer has to confirm during the interview, such as the household address, and the interviewee's willingness to participate or not. This form is necessary to identify the household and its members.

A second form is devoted to personal information, as sex, age, education level, parental relations, occupational status, economic activity and health condition of all household members. It is pre-filled as the first form, with new members added by the interviewer.

A third form collects information about housing condition, house tenure, household economic conditions, some goods consumption and household income sources.
The respondent for these forms can be a single adult.

A fourth form includes questions about the economic activity of individuals and income received in the reference year, usually the year before the interview. In this case, all members of household with more than 15 years old have to complete this form.

(iv) The data

The EU-SILC collects a range of variables on many dimensions of household living conditions. For example, on income the survey collects data for many income components: income from rental of a property or land, interests, dividends, profit from capital investments in unincorporated business, social benefits for family or children related allowances, social benefits for social exclusion not classified elsewhere, social benefits for housing allowances, regular inter-household cash transfer received, alimonies received and paid, interest repayments on mortgage, income received by people aged under 16, regular taxes on wealth, regular inter-household cash transfer paid, tax on income and social contributions, repayments or receipts for tax adjustment.

At personal level the collected variables are: cash or near-cash income of employee, non-cash income of employee, company car, employer's social insurance contribution, optional employer's social insurance contributions, contributions to individual private pension plans, cash benefits or losses from self-employment, value of goods produced for own consumption, pension from individual private plans, unemployment benefits, old-age benefits, survivor's benefits, sickness benefits, disability benefits, education-related allowances.

Since in the survey the occupational status of household's members and the economic sector are collected, thanks to this information it is possible to select agricultural households and compute indicators on income: income level, poverty status, material deprivation, household income distribution (Gini, percentile ratio, etc). One of the main advantage with EU-SILC is that is possible to compare results on agricultural households with those of other socio-professional categories.

FOCUS PIECES

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Focus on Income and Wealth Statistics for Poland[1]

In Poland the EU-SILC (Statistics on Incomes and Living Conditions) project publishes income results for households, including a breakdown by socio-professional group than enables comparisons to be drawn between the income of farmer households (those whose main source is from operating a private farm, i.e. self-employment in agriculture), a range of other socio-professional groups, and the all-households average. It should be noted that this classification relates to the income of the whole household and not that of a reference person (as used in some other sources). The components of income and deductions leading to disposable income are available separately, though not reported here. Latest results are for 2007 and 2008, though the income from farming relates to the previous year.

Substantial caution must be exercised with respect to the figures for farming households. Though there are about 2000 cases (2005), data are collected by face-to-face interviews, not by a survey of accounts or from tax or other registers (Poland's farmers are not taxed on accounted income). Self-employment income data are commonly found to be difficult to collect in face-to-face surveys because of poor survey response rates and unwillingness or inability of farmers (who may not keep accounts) to provide accurate figures. The AgraCEAS IAHS feasibility study (AgraCEAS 2007) reported that in France comparison with other sources of information indicated an under-estimation of this sort of income in the French SILC of about 20%.
That said, the Poland SILC shows the following:

FOCUS TABLE XIV.26
Average annual net disposable income in households by socio-economic group. (Zlotys) in the EU-SILC

	All	Employees	Farmers	Other self-employed	Retirees	Pensioners	Living on other unearned sources
2007							
Income per capita	10576	11360	6255	11132	10989	8375	5834
Index	*100*	*107*	*59*	*105*	*104*	*79*	*55*
Income per CU	16166	18143	10555	17851	14668	10880	8751
Index	*100*	*112*	*65*	*110*	*91*	*67*	*54*
2008							
Income per capita	12164	13068	8008	13386	11804	9544	6269
Index	*100*	*107*	*66*	*110*	*97*	*78*	*52*
Income per CU	18684	20899	13551	21348	15618	12061	9665
Index	*100*	*112*	*73*	*114*	*84*	*65*	*52*

Source: CSO (2009). *Incomes and Living Conditions of the Population in Poland (report from the EU-SILC survey of 2007 and 2008).* Central Statistical Office, Warsaw.

[1]Text provided by Berkeley Hill, 2011.

Another source of information is the Poland Household Budget Survey. In this household are required to keep a diary of income and expenditure for a month, and for farmers this includes transactions related to their private farm. How this methodology copes with the seasonal variability of both costs and revenues is not clear, but it appears that a rotation of sample households takes place over the year. Results are published using a similar breakdown to that of the SILC, though these are given per household and not per head or per CU, making the two sources difficult to compare.

Estimates of disposable incomes (and other income concepts) have now appeared from the 2009 HBS (Central Statistical Office 2010). Focus Table XIV.26 shows that farmer households (defined in the same way as in the SILC) to have average disposable incomes below those of society in general, but by a smaller margin than found in the SILC (per head and per CU). Farmers were in a lower relative position when medians were used for the comparison (some 29% below compared with 20% below when using means), presumably reflecting the numerical dominance of very small farms in the agricultural structure of Poland.

FOCUS TABLE XIV.27

Monthly average disposable income in households by socio-economic group. (Zlotys) from the 2009 Poland Household Budget Survey

	All	Employees	Farmers	Other self-employed	Retirees	Pensioners	Living on other unearned sources
2009							
Income per household	1072	1087	857	1341	1114	825	
Index	*100*	*102*	*80*	*125*	*104*	*73*	
Median Income per household	905	899	642	1081	1042	723	
Index	*100*	*99*	*71*	*119*	*115*	*80*	

Source: CSO (2010). *Household Budget Surveys in 2009*. Central Statistical Office, Warsaw.

The SILC and HBS both suggest that Poland's farm households have average disposable income substantially below the all-households average, though the margin seems to increase when measurement moves from per household through per CU rather and per head. However, they would probably still be lower if allowance is made for the possible under-reporting of income from farming of the order of 20%.

FOCUS PIECES

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CSO (2010). *Household Budget Surveys in 2009*. Central Statistical Office, Warsaw.

Focus on Income and Wealth Statistics for Sweden

(i) Introduction

Sweden provides another example of how registers can be used for calculating agriculture household income. Data are extracted from the following three registers:

- **The Farm Register (LBR)** which changed somewhat in 2000, resulting in a slight reduction in the number of operators per farm and a sharp reduction in the number of old operators.
- **The Register of Total Income Statistics (IoT)**, which contains information for the whole Swedish population, with unique personal identifiers, about income, deductions, taxes and social transfers.
- **The Register of the Total Population (RTB)**. As of 1999, the household concept was changed for the calculation of Eurostat's Income of the Agricultural Household Sector (IAHS) statistics. Previously, only the operators and the spouse were included. In the new concept a maximum of two generations are included provided they are related to each other and are registered at the same address[1].

Results quoted here a taken from what Sweden contributed to Eurostat's IAHS statistics before it was suspended in 2002. Later results are known to have been calculated by Statistics Sweden and sent to Eurostat (the latest being for reference year 2006). Nationally published results for the total income of farm households do not contain comparisons with other socio-professional groups or the all-households average

(ii) Agriculture household income 1999-2002

In 2002, the average agriculture household income[2], before transfers, amounted to about 314,000 SEK, of which net income from self-employment (including interest adjustment for the self-employed) amounted to 23% (see Focus Table XIV.28). This share was only slightly above the corresponding share in 2000 when the new family concept was adopted. While net disposable income increased by 18% in the period 1999-2002, the household income before transfers only rose by 11%. Wages and salaries rose by 14% while income from self-employment surged by 29%. This was partly offset by a fall of 35% in net capital income.

Average net disposable income for agricultural households amounted to just over 90% of average net disposable income for all households. Its share rose, however, by about three percentage points in the period 1999-2000.

[1]There is no information about couples living together but not having common children. This results in an overestimation of single person households.

[2]*Editor – the coverage of households in this paragraph is not clear, though it appears to correspond to the farms register.*

(iii) Agriculture household income according to IAHS – comparison between socio-economic groups

IAHS data for Sweden are available for 1999 and 2000. Of a total population of 75,281 agricultural households ("broad" definition) (or about 1.6% of all households in Sweden), 18,339, or 24% of all agriculture household and 0.4% of all households, fulfilled the IAHS criteria for the "narrow" definition.

In 2000, the average agricultural household ("narrow" definition) net disposable income amounted to about 213,000 SEK. This compares with 203,000 SEK for other self-employed, 233,000 SEK for employees, 220,000 SEK for all farm households ("broad" definition) and 189,000 SEK for all households (see Focus Table XIV.29 and Focus Figure IV.13). Households with only employees thus had 23% higher net disposable income than the average of all households, the category all farm households were 16% better off, farmers ("narrow definition") +13% and other self-employed +7%. On the other hand, the growth in net disposable income between 1999 and 2000 was, compared with all households, twice as large or more for farmers (both "broad" and "narrow" categories) and other self-employed.

Of total resources received, net operating surplus from independent activity, but excluding owner-occupied housing, amounted to 60% for farmers with the "narrow" definition, 62% for other self-employed and 18% for all farmers.

Looking at the distribution of average farm household ("narrow" definition) income by the three major regions of Sweden, there were rather marginal differences (see Focus Figure XIV.14). However, when household income distribution was broken down by farm size it was a different story. Average household income for farms with 200 or more hectares was twice that of households with farm size of 5-10 hectares and of 10-20 hectares (see Focus Figure XIV.14).

As would be expected average household income peaked for operators in the age group 40-49 years and was lowest in the age group 30-39 years (see Focus Figure XIV.16).

Statistics Sweden and the Swedish Board of Agriculture have not published IAHS statistics for the years 2001 and 2002 as the calculations of owner-occupied housing, with the method applied, was considered to be misleading. This was mainly due to the evolving differences in the tax evaluations of houses on farms, compared with other houses.

FOCUS TABLE XIV.28
Agriculture households income after transfers, 1999-2002. Average per household in Swedish kronor

	2002	2001	2000	1999	%, 1999-2002
Wages and salaries	246,100	235,200	226,400	215,300	14.3
General deductions	4,300	4,300	4,200	3,600	
Net income from self-employment (including agriculture)	52,400	51,200	45,900	40,600	29.1
Changes in expansion capital	20	1,200	1,700	600	
Net capital income	19,700	22,900	29,000	30,400	-35.2
Of which Net interest adjustment for self-employed ***/**	19,700	19,700	18,600	16,300	
Household income before transfers	**313,920**	**306,200**	**298,800**	**283,300**	**10.8**
Net income from self-employment (incl. Net interest adjustment for self-employed) as a percentage of household income before transfers	**23.0**	**23.2**	**21.6**	**20.1**	
Positive transfers	11,900	11,400	10,700	9,500	25.3
Negative transfers	100,300	101,600	104,000	12,400	-2.1
Net disposable income	**225,520**	**216,000**	**502,500**	**190,400**	**18.4**
Net disposable income with members of 18 years and over	247,400	240,600	239,000	217,800	15.2
Farm households as a percentage of all households	91.2	89.8	86.0	88.6	

Note: Data for all households (Source: Statistics Sweden: *Disponibel inkomst för samtliga hushåll 18-år, medelvärde, löpande priser,kr, efter hushållstyp, alder och tid*) are calculated fom a different survey than farm households. Only a rough comparison can be made between the two sets of data.

***/** Net interest adjustment can be used by farmers and other self-employed in order to get corresponding taxation as other enterprises.

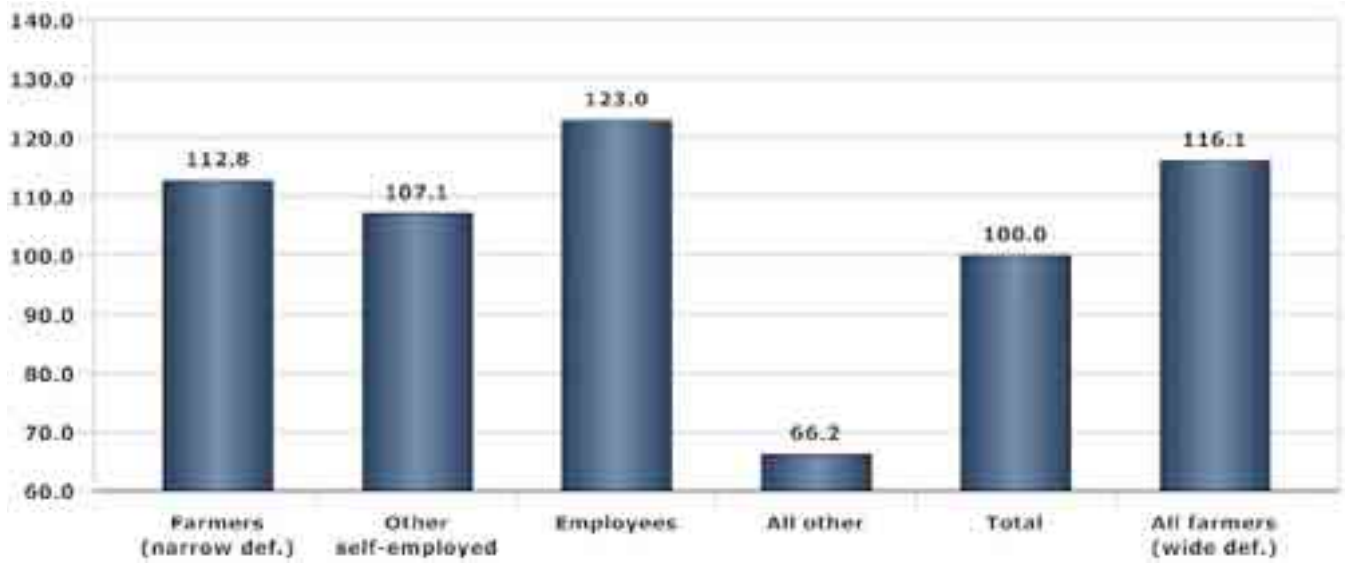
Source: *Statistics Sweden and the Swedish Board of Agriculture: Statistiska Maddelanden,* JO 42 SM0401

FOCUS TABLE XIV.29
Agriculture households income after transfers, 1999-2002. Average per household in Swedish kronor

		Farmers (narrow def.)	Other self-employed	Employees	All other	Total	All farmers (wide def.)
1a+	Net operating surplus (mixed income)from independent	**227,500**	291,600	4,200	1,300	11,600	**79,100**
1b	Agricultural and non agricultural activities						
1c	From imputed rental value of owner-occupied dwellings	**26,900**	19,600	16,000	8,400	13,100	**26,300**
2a	Compensation to members of agricultural households as employees, from agricultural and non-agricultural activity, i.e. wages and salaries	**52,000**	67,600	315,800	10,400	186,900	**169,800**
2c	Imputed social contributions	**21,800**	28,500	132,800	4,200	78,500	**71,200**
3	Property income received (rent, interest, dividends, etc.)	**10,400**	11,900	5,800	9,700	7,500	**10,300**
4	Non-life insurance claims (personal and material damage)						
5	Social benefits (other than Social benefits in kind)	**42,000**	53,600	45,700	158,900	90,800	**72,200**
6	Miscellaneous inward current transfers						
7	**Total resources (sum of 1-6)**	**380,600**	**472,900**	**520,200**	**192,900**	**388,400**	**428,900**
8	Property income paid	**8,900**	19,400	17,100	4,600	12,200	**13,300**
9	Net non-life insurance premiums						
10	Current taxes on income and wealth	**78,800**	150,000	106,300	53,600	86,400	**86,900**
11	Social contributions	**76,800**	95,700	161,300	7,700	98,200	**106,100**
12	Miscellaneous outgoing current transfers	**2,700**	5,200	2,700	1,800	2,400	**3,000**
13	**Net disposable income (7 minus 8-12)**	**213,400**	**202,600**	**232,800**	**125,300**	**189,200**	**219,600**
	Net disposable income in 1999	**195,000**	**182,700**	**222,000**	**125,000**	**181,500**	**203,800**
	Percentage change 1999/2000	**9.4**	**10.9**	**4.9**	**0.2**	**4.2**	**7.8**
	Number of:						
	Persons in the households	**47,364**	272,925	5,845,825	2,705,462	8,871,576	**194,223**
	Households	**18,339**	123,852	2,672,850	1,854,608	4,669,648	**75,281**
	Persons per households	**2.58**	2.20	2.19	1.46	1.90	**2.58**

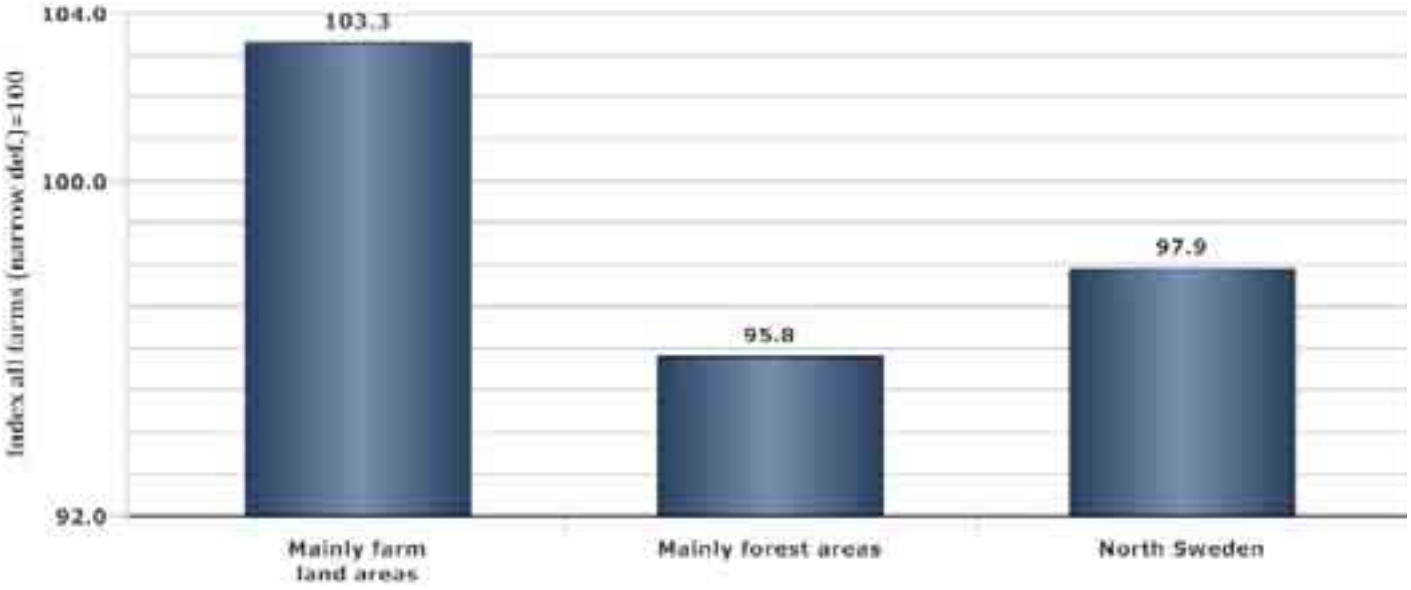
Source: *Statistics Sweden and the Swedish Board of Agriculture: Statistiska Maddelanden*, JO 42 SM0401

FOCUS FIGURE XIV.13
Index of net disposable household income 2000 by socio-economic groups, total households=100



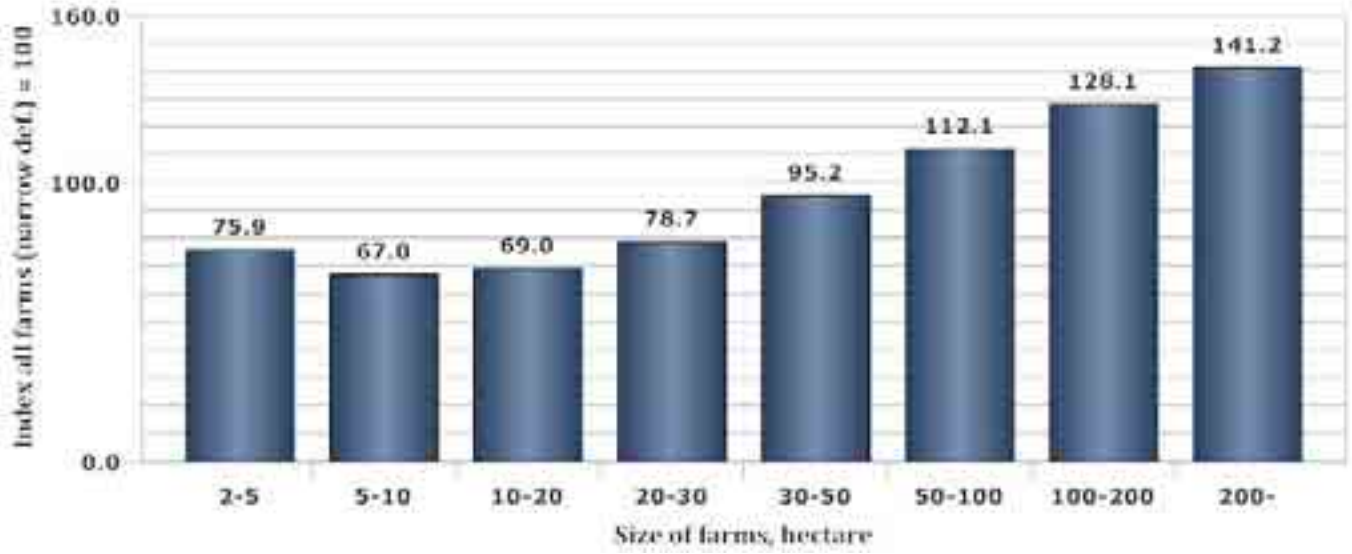
Source: *Statistics Sweden and the Swedish Board of Agriculture: Statistiska Maddelanden,* JO 42 SM0201

FOCUS FIGURE XIV.14
Index of average farm household net disposable income (narrow definition) by type of region in 2000. All farm households (narrow definition) = 100



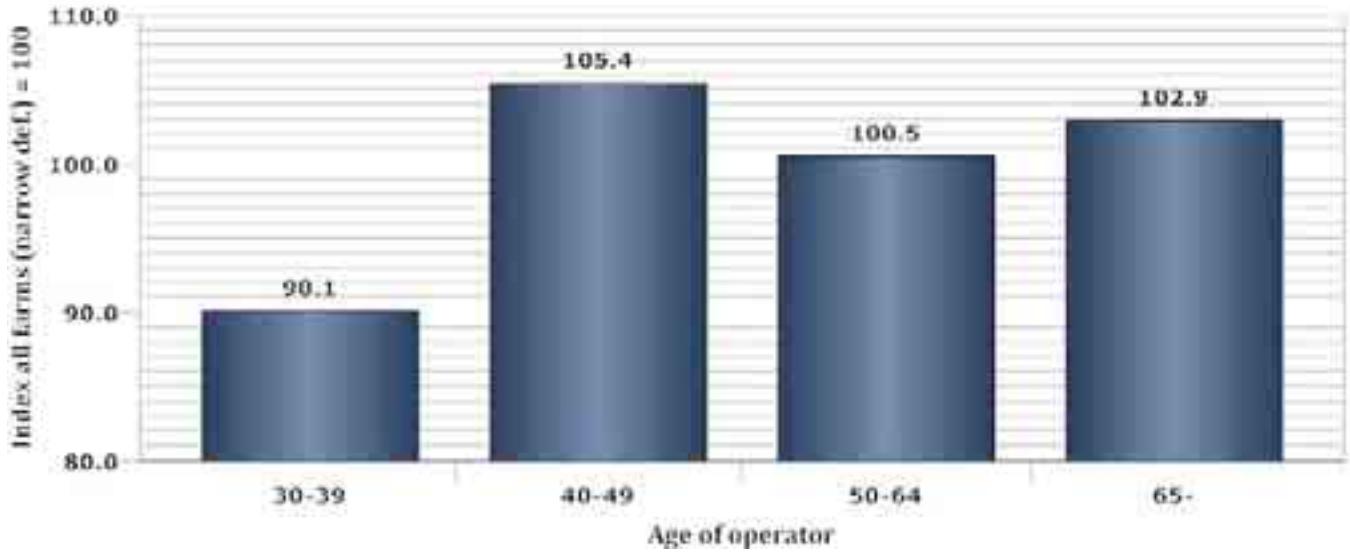
Source: *Ibid.*

FOCUS FIGURE XIV.15
Index of average farm household net disposable income (narrow definition) by size of arable land in hectare in 2000. All farm households (narrow definition) = 100



Source: *Ibid.*

FOCUS FIGURE XIV.16
Index of average farm household net disposable income (narrow definition) by the age of the operator in 2000. All farm households (narrow definition)=100



Source: *Ibid.*

FOCUS PIECES

Eurostat (2002). *Income of the agricultural households sector – 2001 report*. ISBN 92-894-4471-1, published in electronic form, that contains results plus methodological and background material.

Focus on Income and Wealth Statistics for the United States

1) The Agricultural Resource Management Survey (ARMS)

The Agricultural Resource Management Survey (ARMS) is essential to the research and analysis mission of the Economic Research Service (ERS), and is a key input to economic statistics produced by the United States Department of Agriculture and other agencies. It provides the information base for sector estimates of value added, income for farms by type of commodity specialization, costs of producing major crop and livestock commodities, indices of prices paid by farmers for production inputs, and a report on the status of family farms. The ARMS also supports the Department's estimates of household income and wealth, and is used in a variety of applied farm production, management, technology adoption, resource use, and household well-being research applications. While the ARMS became a stand-alone survey beginning with the 1996 calendar year survey, it retained and built upon features of survey activities that date to the 1970s. This paper provides a synopsis of events that contributed to the development of the ARMS, gives an overview of purposes served by the survey, discusses survey design and content, highlights research program activities, and closes by giving a perspective about the ARMS as an evolving survey instrument.

(i) Origin of the ARMS as a Principal USDA Survey

In 1974, the United States Congress wrote legislation that required the United States Department of Agriculture (USDA) to "conduct a study of the costs of producing wheat, feed grains, cotton, and milk and to produce annual estimates of costs that were representative of the sizes and types of farms engaged in production, and the range of technologies in use". The requirement to produce cost estimates was followed by funding to conduct commodity surveys.

Meanwhile, funding was also provided in the mid-1970s to survey farm business establishments about production expenses, capital expenditure, and other general economic information. This survey became the Farm Production Expenditure Survey, which the ERS and the National Agricultural Statistics Service (NASS) shared jointly in developing and funding. This collaborative effort was facilitated since both the research agency and statistical agency were in the same mission area of the Department.

The Farm Production Expenditure Survey contained detailed questions about production practices and input use in crop and livestock production, and about expenditures for the business as an establishment. Information for sales, inventories, assets, or liabilities of the business was incomplete or non-existent in surveys conducted during the late 1970s and into the early 1980s. Inadequate survey content prevented analysts from developing estimates of income for business establishments, producing firm-level balance sheets, or putting into context costs incurred in the production of crop or livestock commodities.

Extending Survey Activity for Farms and Households of Farm Operators

Three events provided motivation to change the survey content and sample design of the Costs of Production and Farm Production Expenditure Surveys. One involved ERS efforts to re-examine economic information produced for the United States farm sector, and a growing recognition of the inadequacy of the "one farm, one farmer, and one farm household concept". Second, was recognition of the need to collect data that more accurately reflected the relationship of households to their farm business. The third major event that crystallized need for improved business-household income and finance data was the farm financial crisis that spanned the United States in the 1980s. The ERS and the NASS were responsible for measuring the extent of financial difficulty in farming and rural communities, and financial institutions, in the United States but existing survey instruments were not suited to this task.

Economic accounts and estimation systems built in the early part of the twentieth century were not very effective in providing information about different groups of farms or households that made up the farm sector a half century later. The agricultural, economic and finance literature was evolving to present a case for thinking about farming in terms of households as well as business establishments (Schertz, 1982). Key questions raised by this work included: To what extent was resource ownership and use separated in farm production? What was the distribution of farms among different household models, ranging from those that owned all resources and retained earnings to those that provided entrepreneurial resources, but only some of the other resources used in production? What was the distribution of income and wealth among different household groups? To what extent did households that provided resources to farming also provide resources to other activities? A system of data that included information on both farms as business establishments and on households offered a solution to address these questions (Schertz, 1982). Microeconomic indicators were needed to test economic hypotheses and to extend the knowledge base for farms and farm households, especially with regard to analyses of income and wealth (Johnson, 1984; Johnson & Baum, 1986; Baum & Johnson, 1986; Gardner, 1975; Ahearn, 1986). These articles pointed to conceptual shortcomings in farm and farm household data and made recommendations for improvement in survey content.

Meanwhile, farm financial difficulties had become an agenda item for the United States farm sector at the beginning of the 1980s. The USDA and the public had only incomplete information and anecdotal evidence with which to assess the scope, intensity, and nature of the problem. ERS analysts had started to revise content of farm business surveys to support estimates of business establishment cash operating margins and to fortify revised farm sector accounts. However, these actions by themselves were insufficient to address debt levels, farm business solvency, and the debt service capability of institutions that operated farms, including farm households. Moreover, the data were not sufficient to address whether household sources of income and equity altered the perspective about farm business vulnerability.

The ERS and the NASS concluded that a new survey design was needed, while recognizing that the agencies faced time and funding constraints. The solution was to merge the independent Costs of Production and Farm Production Expenditure surveys into an integrated survey of farm businesses. The goal was to meet data needs for specific farm enterprises, farms as business establishments, and for farm operator

households, from the perspective of a rudimentary measure of "non-farm" income. These objectives were achieved by developing a new enterprise-farm-household based survey. The integrated survey established for 1984, called the Farm Costs and Returns Survey (FCRS), consisted of a sample drawn from a list frame of medium to large farms and a complimentary area frame for completeness that covered new entrants and smaller farms. The FCRS used multiple questionnaire versions in a modular design. Each questionnaire version contained common, global questions that permitted collection of data items for farms and households across the entire survey sample.

Improvements in survey design and content resulting from the 1984 merger enabled the USDA to generate estimates of net cash income for business establishments, a measure of net cash income for operator households, and measures of business solvency and debt repayment ability. Information for farms, including debt owed to specific lender groups, allowed ERS analysts to assess the extent of potential loan losses of farmers and lenders and to examine how potential financial problems varied among farms and households by size of business operation, location of farm, and by lender group (Hanson, 1987; Hanson *et al*., 1991; Jolly *et al*., 1985; Johnson *et al*., 1985; Johnson *et al*., 1987). The collaborative nature of work needed to develop the FCRS under tight time constraints and using available resources drew heavily on the ERS and the NASS being in the same mission area of the USDA.

Extending Data to Support Farm Financial Statements

Recognizing that cash based measures of financial indicators were incomplete, survey questionnaires were revised to enable more complete specification of the income statement and balance sheets prepared for farm businesses. New questions measured depreciation and changes in inventory value, providing the basis to move from cash based measures of income to an accrual basis. Other important data improvements also occurred during the mid-1980s. For example, the use of contract arrangements in commodity production was explicitly measured. This was important because it allowed assignment of income and expenses to the appropriate entity. As a result, both the income statement and balance sheet produced for a farm not only reflected economic and accounting standards and concepts, but that their components were partitioned among farms, landlords, and contractors.

Expanding the Scope of Household Income, Wealth, and Demographic Data

Surveys conducted for 1986 and 1987 were the first attempts to collect more substantial information for farm operator households. Information was collected for four components of off-farm income: non-farm related business income, wages and salaries, interest and dividends, and all other non-farm sources of income. Demographic and other information, such as primary occupation, operator age, and education level, which put farm and household income into a broader context that extended beyond the association with a business, were also collected. Off-farm income data collected during this period provided the first opportunity to develop a perspective about the ability of households to service debt out of total income. Moving to this level of analysis raised issues for further refinement, such as the existence of non-farm assets and liabilities and the level of household consumption expenditures. This set the stage for modifying the FCRS to allow a more explicit focus on the household.

The survey developed for the 1988 calendar year marked the first extensive collection of data for the operator's household. Innovations that focused on the household included information on household sharing of income with other entities enabling a determination to be made of what portion of the farm business net income was earned by the farm operator household. The survey also gathered information necessary to prepare farm operator household balance sheets. Information on household assets by component of asset, such as cash, chequeing account, money market account, corporate stock, surrender value of life insurance and other financial assets, trucks, cars, and other assets was gathered. Detailed information on household assets was accompanied by questions focused on household debt and more explicit accounting of off-farm income. Hours of off-farm work by the farm operator and spouse were also enumerated along with their on-farm work hours. The survey also collected data on consumption expenditures, and goals and attitudes about the farm operation.

While the 1988 survey could be characterized as the first concerted household data collection, the instrument developed for 1991 was designed to enable estimation of a household model while supporting the development and reporting of estimates of household income and wealth. This was accomplished by extending questions pertaining to household economics to include questions related to operator and spouse labor allocation and employment decisions. The specific types of information included: the number of household members, age and education, commuting distance, years worked at a particular job, how long the household had operated a farm, whether the operator or spouse were raised on a farm, years worked at any off-farm job, benefits from off-farm work, consumption expenditures, and household assets and liabilities. The 1991 survey also contained questions needed to support estimation of farm business and household income and wealth, to establish a relationship between the household and the farm it controlled, and to support assessments of the financial status of farm households drawing on both income and wealth attributes.

The collection of household-farm linked data was enhanced by adding modules of questions focused on the business as an establishment, the household as an institutional unit, and members of the household to an existing survey that was national in scope. While the content and sample design of the on-going survey were changed, existing funds were used for data collection.

Agricultural Resource Management Survey (ARMS) Emerges from On-going Survey Activity

In 1996, the ERS and the NASS undertook a second merger of independent survey activities. This merger combined the FCRS and Cropping Practices surveys conducted by the USDA. The Cropping Practices survey focused on collection of yield, production practices, and input use data at a field level. Advantages of this merger were to link household and farm economic data to field-level chemical use and production practice data and to expand information available for assessing cost distributions and technology and practice adoption.

Merger of independent surveys into the ARMS set the stage for further integration of the ARMS into NASS' on-going Census and national survey programs. Integration with the Census of Agriculture was accomplished in 1997 by including questions in the ARMS survey instrument that were needed to complete a Census questionnaire. The practical

result of the Census-ARMS integration was to strengthen the ARMS sample, edit, and summary programs and procedures by drawing from routines created for the Census. Even beyond this, the integration of the ARMS and the Census provides a direct link from the ARMS to the Census.

(ii) ARMS Design Characteristics

The ARMS is designed as a multiple phase, multiple version survey. The first phase of the survey is a screening sample to identify operations that are "eligible" or "in-scope" business operations for the ARMS (see Focus Figure XIV.17). The second and third phases of the ARMS collect information to underpin USDA estimation and research responsibilities. The ARMS supports estimation of household income and wealth, business income and performance measures, sector farm income and value-added, production costs for crop and livestock enterprises, and chemical use by farmers in the production of crop and livestock commodities. The survey is personally enumerated over several months (from July to April) using multiple survey forms (see Focus Figure XIV.17). Samples qualified in the Phase I screening activities for a cost and return survey are contacted in late fall to obtain field-level information about practices and inputs used in the production of the commodity of interest. Those that respond in Phase II are contacted again for a follow up interview as part of Phase III, to obtain information about their farms and households. This link enables analysts to not only establish estimates of costs of producing commodities, but to examine adoption and uses of technology, use of conservation and environmental practices, and participation in government programs.

The largest portion of the total sample is focused on farms and households, not commodity production. This portion of the survey is conducted during the winter to collect information from operators about their farm operation and the economic and financial status of their households, along with socio-economic and demographic information used in classification and analysis. Questions are asked about the prior calendar year. Given the sample design, Phase III interviews for commodity producers can be combined with general purpose phase III farm-household interviews to achieve greater statistical reliability associated with the larger sample.

ARMS samples are stratified by size of operation, type of industry classification, and commodity acres. For the farm-household phase III version of the survey, strata size groups for each state include farms over $1,000,000 in sales, farms with $500,000 to $1,000,000, farms with $250,000 to $500,000, farms with $100,000 to $250,000, and farms with $1,000 to $100,000 in farm value of sales. Farms are further stratified to reflect industry groups such as oilseeds, grains, beans, cotton, milk, or cattle and calves. The farm type classification follows the major industry groups classified in the North American Industry Classification System.

The phase II sample reflects the presence and level of targeted commodity production activities for the reference year. Since the USDA is charged with reporting production costs and returns and chemical use for selected commodities (principally those for which farm programs have traditionally been developed), a portion of the sample has to reflect acreage of major crops. Thus, the sample is stratified to ensure representation of a range of acreage classes. For example in 2004, the sample strata included producers of

cotton that had over 1,500 acres, from 1,000 to 1,499 acres, from 500 to 999 acres, from 200 to 499 acres, and from 1 to 200 acres.

(iii) Content of Current ARMS Survey Questionnaires

The ARMS uses a modular questionnaire design, much like the overall design of the survey itself. All but a few modules are oriented toward collecting information needed to implement the sector-household income links illustrated in Focus Figure XIV.18. Remaining modules collect information required to estimate business and household wealth, to measure household labor allocation and sources of off-farm income, to classify farms and households by structure and demographic attribute, and to support analyses of performance and well-being.

Production Characteristics of the Farm

The initial section of the questionnaire obtains information about rents paid and received that are used in construction of the farm income account and asks the respondent to identify the type of farm operation based on which commodity (or group) represents the largest portion of gross income. The remainder of the first section contains questions that establish the amount of acreage operated, land ownership, and the commodities produced by the farm (see Focus Figure XIV.19). While focused largely on physical attributes of the farm, information is collected to account for the physical quantities of crops produced, the amount owed a share-rent landlord, and the quantity used on farms as an input in further production activities.

Business Income Sources

Information needed to estimate a farm's gross revenue is gathered prior to collecting input expenditures (see Focus Figure XIV.20). This follows the organization of typical income statements. Use of contract arrangements is fairly common among larger farm businesses. It is important to establish the presence of, and collect information on, production contracts, since the farm typically does not own the commodity produced under such contracts. As a result, only a fee for service is counted as part of farm earnings. Marketing contracts are different since farms own the commodity. Payment for commodities delivered under a marketing contract may stretch over multiple years. Thus, the presence of contracts affects accounting for income. This is particularly the case at the farm and household level and is a major reason why we cannot assume that operator households earn all of the income generated by farm businesses.

The income account is completed by collecting cash sales and earnings of the farm from other sources. These other earnings generally arise from government payments or from income earned from use of the farm's resources in gainful activity other than production of crops or livestock. Insurance payments that arise from weather damage or some other source, which may vary over time and among farms, are also included in other farm related income.

Purchased Inputs

The ARMS accounts for the operating and capital expenditures of operators, their landlords, and any contracting entities that may be participating in the business. All major input categories are covered and are set up to enable development of both a

standard business income statement and an estimate of a farm's value added (see Focus Figure XIV.21). The ARMS accounts for employee compensation, real estate and non real estate interest, and capital consumption. These items are needed to move from an estimate of gross value added to net value added and from net value added to net income. Employee compensation is of special interest to the measurement of household income. While wages paid to the operator or household members are expenses to the farm, they are sources of income to the household. Questioning is set up to support this difference between the farm and the household.

Measurement of Household Income from Farming

Household income from farming draws on output, revenue, and expense data collected to provide estimates of value-added, net farm income, and net cash income for the farm (see Focus Figure XIV.22). Cash income for the business is derived by eliminating measures of non-cash income and expenses from estimates of net farm income. This is achieved by collecting information on change in the market value of inventory for crops, livestock, production inputs, and accounts receivable. In addition to depreciation, data are also collected for non-cash expenses and income items such as unpaid benefits to labor, home consumption of farm produced goods, and imputed rents for operator occupied housing owned by the farm operation. These rents, like other non-cash items, are excluded from net farm income to arrive at a cash-based estimate of income from farming.

In the United States, about 300,000 households, in addition to farm operator households, share in the net income of farm businesses. The ARMS explicitly accounts for income accruing to the operator's household by collecting data on the share of farm income received by the operator. To go from this correctly portioned farm business net cash income to an estimate of household income from farming, other sources of farm-related earnings such as wages paid to household members by the farm are added. This last measurement step illustrates that, as self-employed farm operators, households may decide to pay themselves a wage, increase farm expenses, and reduce farm income, but when the household is viewed as the measurement unit, farm wages constitute earned income.

Measurement of Household Income from Farm and Off-farm Sources

Estimates of household income consist of a household's earnings from its farming activities and from its off-farm sources. Based on experience, ERS collects off-farm income data in a series of questions focused on how the household may choose to allocate its resources (labor, entrepreneurial capabilities, financial assets, and physical capital) outside the farm business (see Focus Figure XIV.23). The household may be entrepreneurial and operate another business or a second farm. Or, household members may work off-farm for a wage or salary. For all income except wages and salaries, data are usually collected as a total for the household from each source. For wages and salaries, questions ask about wages earned by the operator and the spouse which, when combined with information on the allocation of labor hours, helps support estimation of household models. In addition to earned income from wages, salaries or self-employment and property income such as interest, dividends or rents, the ARMS asks for transfer income along with any other cash sources of income earned by the household.

Measurement of Business and Household Net Worth

Data are collected to develop a current market value basis balance sheet at a point in time, which for the ARMS is the last day of the calendar year. The ARMS' treatment of the balance sheet has made collection of data to improve measurement at all levels of aggregation from sector to farm and household more explicit. For example, the ARMS asks for each component of land and building assets (operator's dwelling, other dwellings, other farm buildings and structure, orchards, trees and vines and land) and sums these to reach a total land and building value (see Focus Figure XIV.24). This approach provides information that supports the income account as well as the balance sheet. Remaining questions for farm assets focus on establishing value levels for crops stored, livestock (including separate estimates for breeding and non-breeding livestock), production inputs (including separate estimates for inputs on hand and inputs used for crops destined to be fed to livestock), trucks, cars, machinery, tools, equipment, stock in farm cooperatives (which may be required to contain business loans, purchase inputs, or sale outputs), money owed the operation for sale or production of agricultural commodities or products, and other assets owned by the operation. For crops, livestock, production inputs and money owed the farm for sales of production, beginning and end of year values are collected. Year-over year change in the value of inventory for these items is used in developing farm-level estimates of net income and value-added. In contrast with the approach used in the sector accounts, physical quantities of crops and livestock on hand at points in time are not collected so that they could be valued with an average price. A more general approach is used to lessen respondent burden.

Information about farm debt is collected to support calculation of net worth, with net worth being equal to total value of assets minus total debt. Specific information for up to the five largest loans is obtained along with the total for any debt owed on additional loans. For each loan, information on the balance at year-end, interest rate, year it was obtained, portion for farm purposes, purpose of the loan (such as refinancing) and whether or not the loan was guaranteed by some government entity is requested. These data are used to produce an estimate of the farm's debt service commitment.

In addition to debt repayment capacity measures, the ARMS business balance sheets are used with farm-level income statements to produce indicators of profitability, solvency, liquidity, and financial efficiency for the farm.

Moving beyond the farm business to the household, the ARMS explicitly measures sources of household non-farm assets and debts on a more frequent basis (see Focus Figure XIV.25). Annual estimates of household assets and liabilities are obtained to combine with detailed farm business asset and debt measures. Detailed components of non-farm assets and debt are collected periodically in the ARMS. These data are used to gauge household participation in a variety of financial markets and to examine savings and investment behaviour in the context of a portfolio that reflects households' goals and objectives, and to compute extended measures of well-being that incorporate both income and wealth measures into the analysis.

Classification and Analysis

The ARMS is developed to recognize a long-standing interest in characterizing farms and households using a variety of size, organization, vocation, work status, and income dimensions. This work recognizes farm and household diversity. Recently, emphasis on households and individuals that operate farms has expanded. This expansion has resulted from dual career, multiple job-holding experiences becoming more common among farm households and from farms being organized or re-organized so that, in some cases, the operator's household and its members neither provide all assets nor earn all farm income.

Placing these changes into context along with traditional information needs requires data for firms, households, and individuals engaged in farming. The ARMS has been designed to collect data at each level of measurement — farm, household, and individual. For the farm, the focus is on identifying the number of operators engaged in the business, structure of the farm's management team, the legal status of the business, number of households sharing in business income, and the number and types of claimants on farm income. These farm business data help measure how total income produced by the farm is shared among a variety of stakeholders and provides a perspective about the diverse nature of farms in the United States.

Operator, spouse, and household data are intermingled. From an individual perspective data that traditionally have been collected for operators such as age, education, gender, race, occupation, and off-farm work hours have been extended to the primary operator's spouse and for most items, excluding off-farm work, to a second or third operator if present on the farm. Each of these individuals is asked to provide a response to questions about who performs selected managerial or production tasks for the farm. Farm-based questions are expanded by asking respondents about their farm or off-farm occupation and their allocation of work time to off-farm jobs. In addition, the ARMS collects information about years of experience with farm and off-farm jobs, reasons for off-farm work, timing of farm and off-farm work decisions, and type of work performed. These data help put on-farm and off-farm work decisions into perspective. To further characterize differences among households that operate farms, a variety of goal, attitude, managerial choice, and policy response questions are asked. For example, in recent years, questions have been asked about retirement and succession plans, timing of input purchases, and response to changes in input prices. Information about how farmers generally allocate fixed direct payments received from government programs between farm and household uses has also been requested.

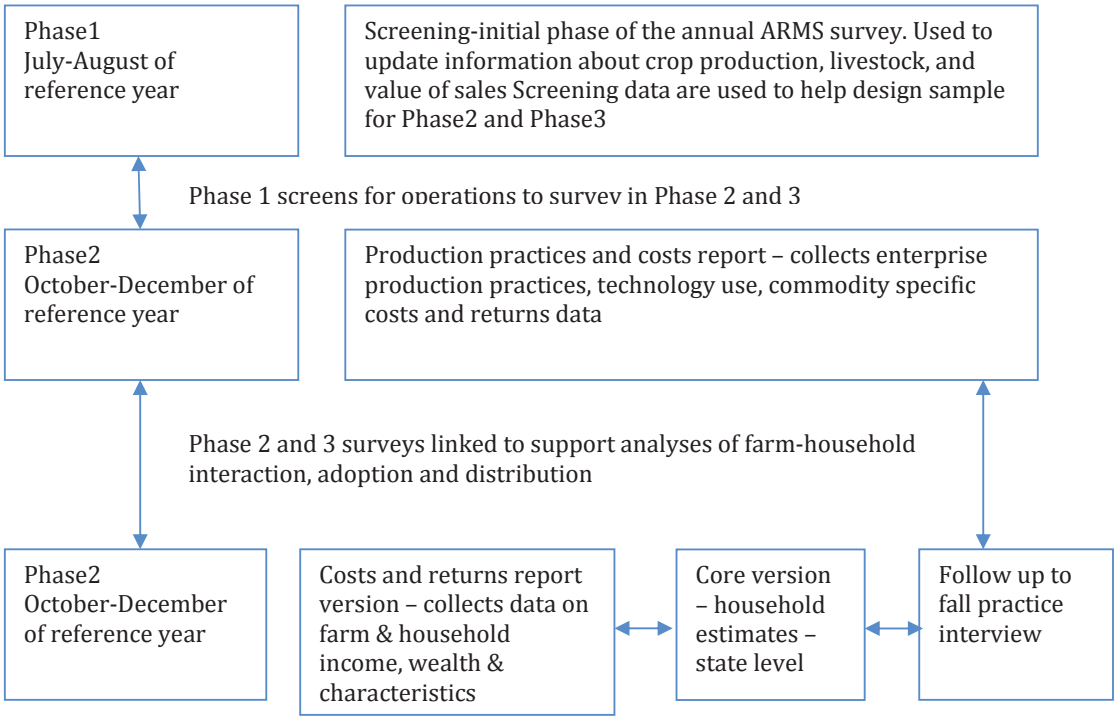
Household questions are designed to provide information about the structure and economic situation of the household. Income, asset, and debt data are extended with a series of questions about the household's estimate of basic needs, living expenditures, prior year levels of income and expenditures, and the size and composition of the household as measured by the number and age of household members.

(iv) ARMS: An Evolving Survey

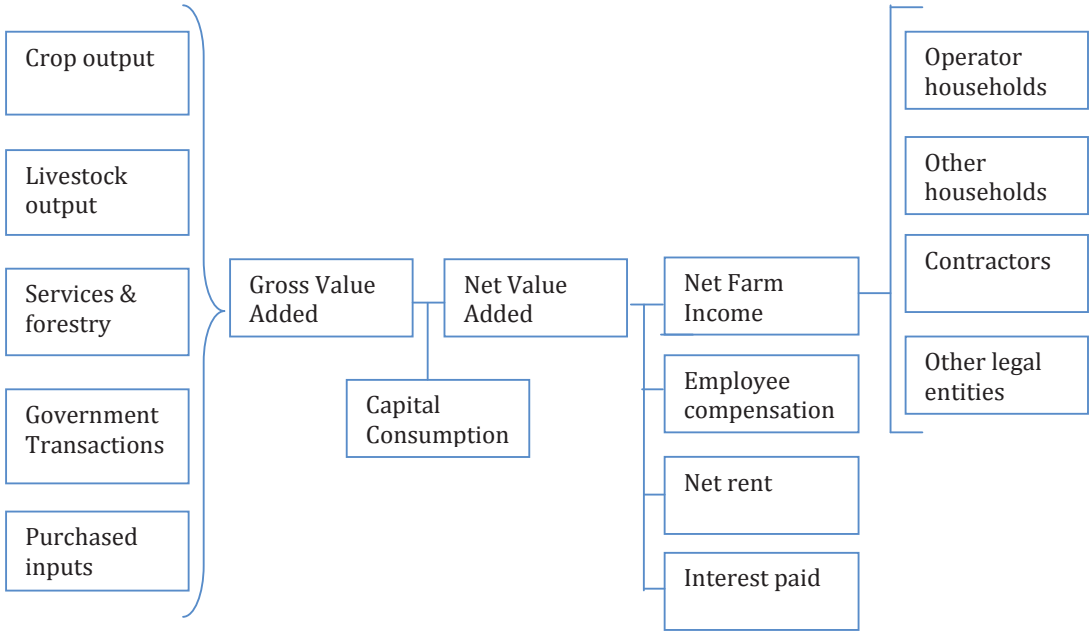
The ARMS is an evolving survey instrument. The ERS and the NASS have made many substantive changes to help ensure that survey results more accurately align with official estimates from all parts of the United States farm economy. Likewise, close

attention has been paid to survey content from two major vantage points. First, care is taken to make sure that the ARMS provides data to implement economic and accounting concepts ingrained in estimates of income and wealth. Second, the ARMS is used to assist research focused on issues of importance to the USDA and the farm sector. Issues change over time. Likewise, the organization of farms and the households that control them change and adjust to a variety of policy, economic, and personal stimuli. These adjustments in the various target populations (individuals, households, and farm businesses) indicate that the ARMS will continue to adapt. New methods and ways of collecting data, both to be more effective in reaching farmers and in reducing their burden, will be tested. The ERS and the NASS will continue to examine content requirements to meet new data needs while ensuring that up to date concepts are used in the measurement of household, business, and sector income and wealth. Taken together these steps will refresh the ARMS and increase the likelihood that it will remain a valuable instrument that adequately represents United States farms and farm households.

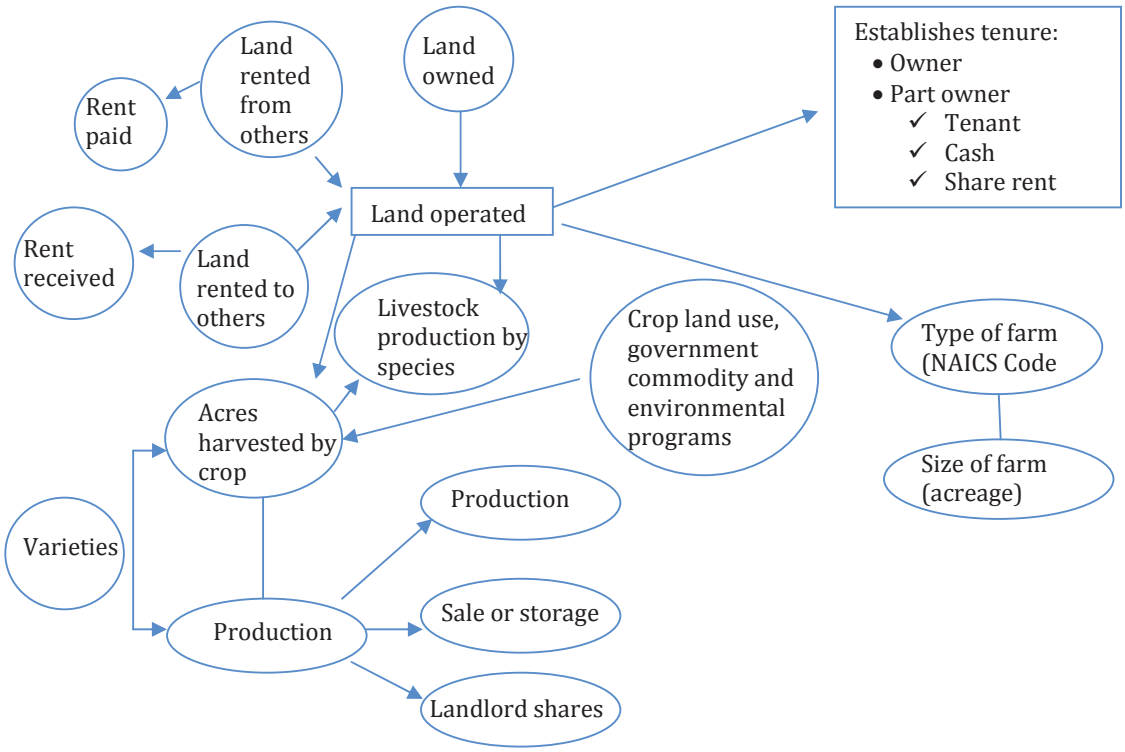
FOCUS FIGURE XIV.17
ARMS has a modular design to reflect complex farm-household production, financial structure and organization



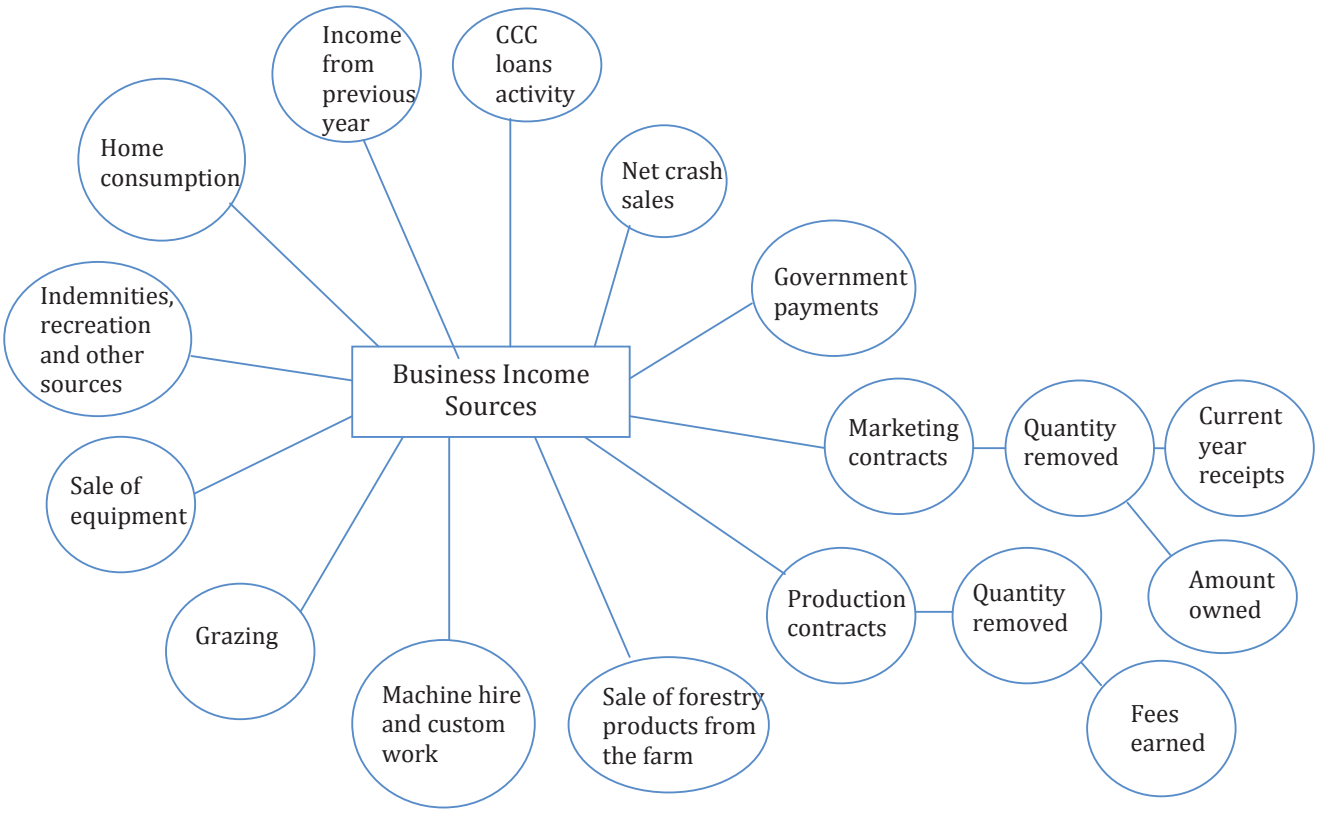
FOCUS FIGURE XIV.18
Aggregate farm sector-household link in income estimation



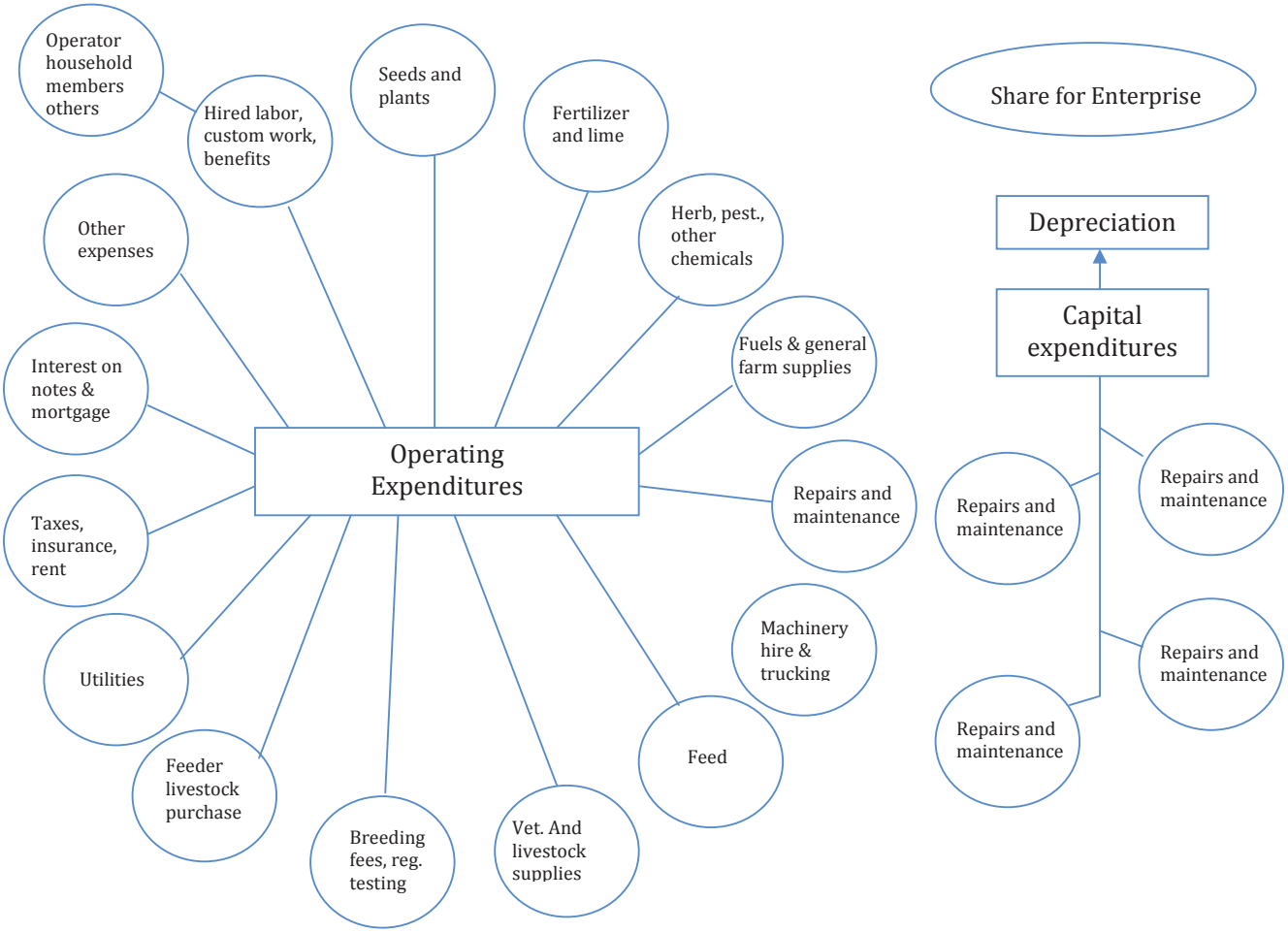
FOCUS FIGURE XIV.19
Land use, tenure, crop and livestock production



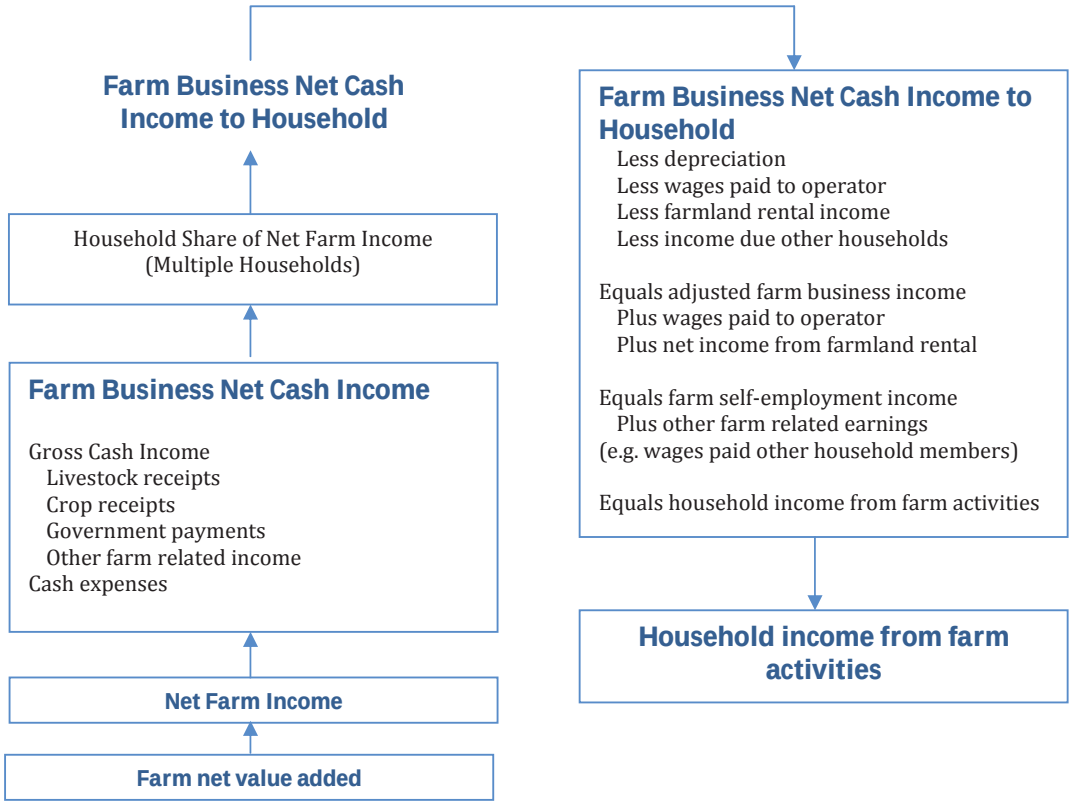
FOCUS FIGURE XIV.20
ARMS: farm business income sources



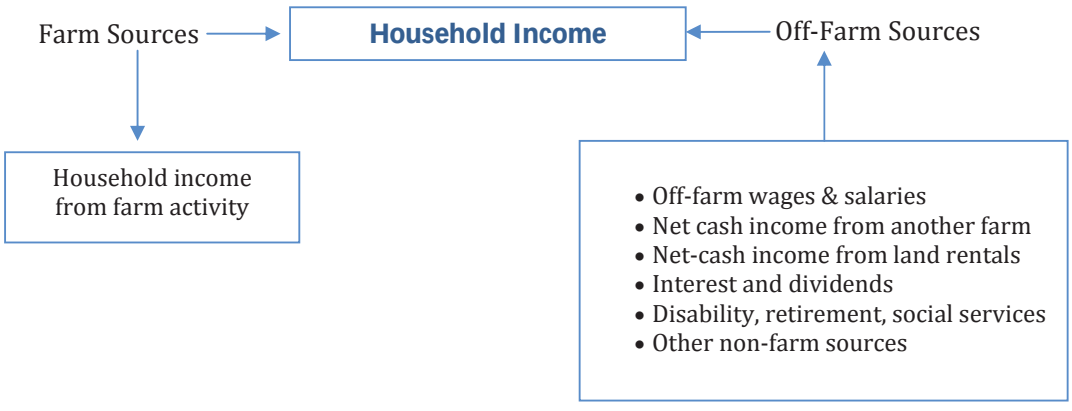
FOCUS FIGURE XIV.21
ARMS: farm business expenses



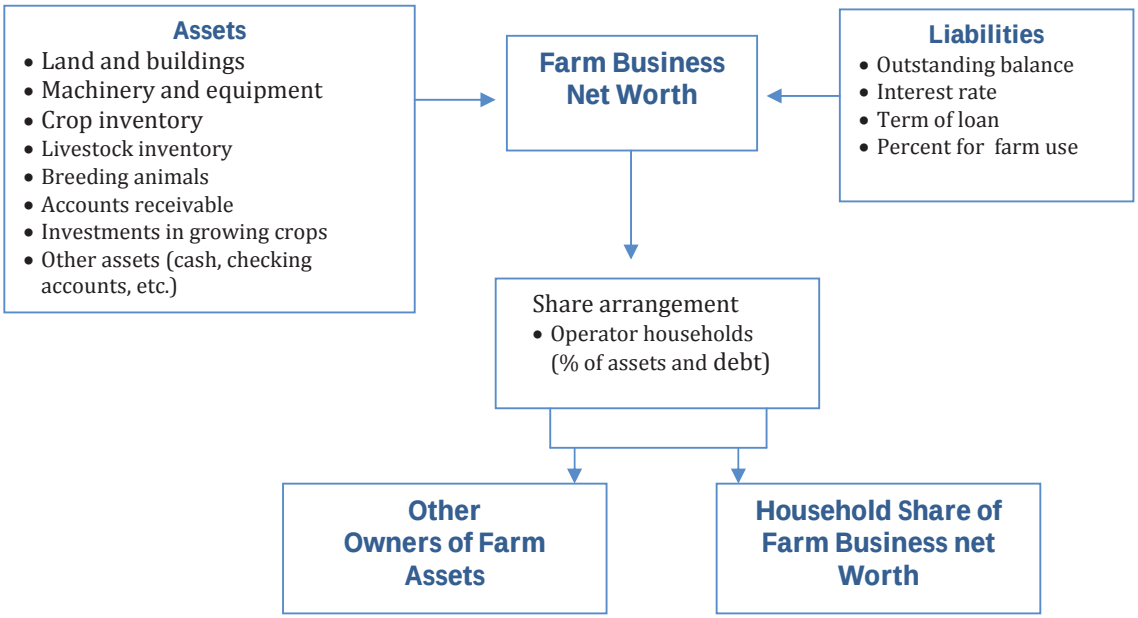
FOCUS FIGURE XIV.22
Measurement of household income from farm activity



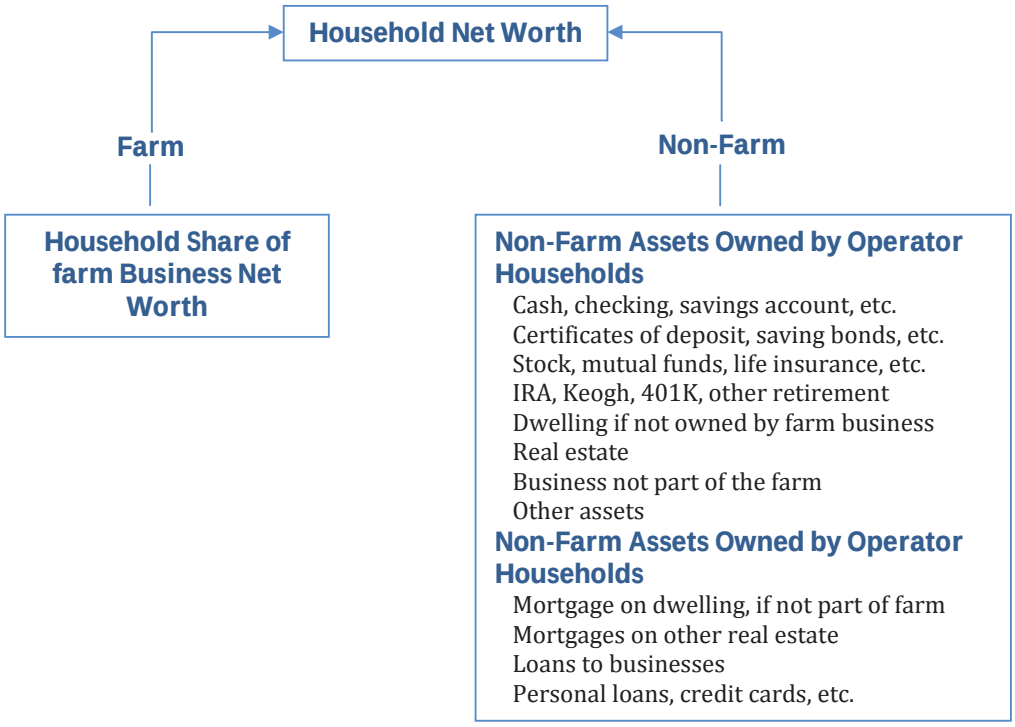
FOCUS FIGURE XIV.23
Measurement of household income from farm and off-farm sources



FOCUS FIGURE XIV.24
Net worth of farm business operated by households



FOCUS FIGURE XIV.25
Household assets, debt and net worth



2) Agriculture household income and wealth statistics

(i) Introduction

Income from the farm business is now shared among many parties, and farm household income from off-farm work, investment, and other sources has increased dramatically. Returns from farm production activities center on the farm business. However, assessment of farm household well-being must focus on the household as the unit of analysis, or risk drawing incomplete or incorrect conclusions about farmers' income and households' economic well-being. In addition, sector-wide income estimates can obscure structural changes that have occurred in farming and in household labor and investment decisions, and thereby provide incomplete information about the distribution of income among farm households. For these reasons, the farm household is used as the unit of analysis for considering both income and wealth relative to non-farm households, and for considering the distribution of income and wealth, including the ability of income to meet household consumption needs.

The data and analysis below are extracted from *Income, Wealth, and the Economic Well-Being of Farm Households* prepared by the Economic Research Service of US Department of Agriculture. The data for 1999 reported in this publication have been supplemented on a selected basis with data for 2003.

(ii) Income and well-Being of farm households

Off-farm work by farm operators and their spouses has increased steadily since the mid 1960s. In 1969, total net income earned by farm households from farming and off-farm earned income was roughly comparable at $15 billion, with off-farm wages and salaries providing $9 billion of the total. By 1999, total off-farm income in the agriculture sector had increased to $120 billion, compared to $44.3 billion in net income earned from farming (see Focus Figure XIV.26). In 2003, off-farm earnings totalled $122.6 billion and net farm income was $59.2 billion, which continues to underscore the importance of off-farm earnings to the total incomes of farm households.

(iii) Income and expenditures by household size

Focus Figure XIV.27 gives details about income and expenditures by three size classes of households in 1999 and 2003. Total expenditures were highest in farm households with five or more people in 2003. This group spent an average of $43,000, compared with $34,000 for households of one or two members. This is expected since households with two or fewer persons have lower average household income, whether farm or non-farm. It is interesting to note that while income rose only marginally between 1999 and 2003 (and, indeed, fell slightly in households with five or more people), expenditures increased substantially for each size class of households. This implied that the non-consumed part of income (income less expenditure as a percentage of income) fell. For households with five or more members the share was almost halved, reaching 36%. For households with three or more members it fell from 56% to 41% and for households with one or two members from 63% to 47%.

As a figure for comparison, in 1999 the average expenditures of all American households amounted to about $37,000.

(iv) Farm households working more off the farm and accumulating wealth

The average money income of farm households in the United States first exceeded that of all United States households starting in 1972. Incomes of farm households periodically exceeded the incomes of all United States households from that time until the mid 1990s. Income of farm households has consistently been higher since the mid 1990s (see Focus Figure XIV.28). Average farm household income in 2003 was about $68,500, compared with $59,100 for the average non-farm household. Median income for farm households has also been roughly on par with the median income of all United States households in recent years.

What accounts for the closing of the income gap for farm households? Since 1964, earnings from off-farm sources have grown from about $10 billion to $123 billion (in nominal terms). Meanwhile, sector-wide net cash farm income has only increased by a factor of five (see Focus Figure XIV.29). Thus, the increase in farm household earnings has been driven by the increase in off-farm earnings. In fact, net cash farm income has fallen as a percentage of total income from farm and non-farm sources, from 58% in 1964 to 36% in 2003.

Wages and salaries make up a significant proportion of off-farm earnings, even though they declined from 65% in 1964 to about 56% in 2003.

(v) Largest farms have most income, wealth and debt

Over 90% of United States farms are classified as small farms. However, large and very large family farms, which made up only 8% of all farms in 1999, accounted for 57% of production. Households operating very large farms had the highest average household income, $201,000, about four times the average for all United States households. These farms received only 18% of their income from off-farm sources. In 2003, the income for this group of households had risen to $227,000 (see Focus Figures XIV.30 and XIV.31).

Households operating residential/lifestyle farms or large family farms also had average income above the United States average, but the sources of income differed between the two groups. Residential/lifestyle households received virtually all of their income from off-farm sources, while large farms received just 40% from off the farm. Households operating higher sales small farms had an average income very near the United States average, and half came from off-farm sources.

Limited-resource, retirement, and lower sales farm households had average household incomes below the United States average and relied heavily on off-farm income. In fact, income from farming was negative (see Focus Figures XIV.30 and XIV.31). The 2003 income of households with retirement farms also had a negative contribution from farming. In 1999, the Conservation Reserve Program (CRP) was the primary source of farm income for 21% of retirement farms.

Farm size and wealth are positively related. In 1999, the value of farm assets increases from about $77,000 for limited resource farms to about $1,431,000 for very large farms. Limited-resource, retirement, and residential/lifestyle farms have farm assets below the level of the average farm household (about $389,000). Farm debt follows a similar pattern, increasing from about $6,600 for limited-resource farms to about $368,000 for very large farms. Households operating very large farms had the highest wealth, both farm and non-farm. Interestingly, the wealth of

residential/lifestyle farm households is equally divided into farm and non-farm sources, reflecting the importance of non-farm assets to these households.

(vi) Location influences household income and wealth

Since off-farm income is a major source of income to farm households, location of the farm relative to off-farm employment opportunities is vital. Many studies have investigated the potential effects of the availability and accessibility of off-farm jobs. Farmers near urban areas are likely to have access to more active labour markets, and would be expected to supply more labor hours off the farm, all else being equal.

Two-thirds of all United States farms are located in non-metro counties. About three-fourths of small farms (farming-occupation) and large family farms are in non-metro counties. In addition, about two-fifths of higher sales (small) farms and large family farms are in rural counties not adjacent to a metro area, compared with one-third of all farms.

On average, about one-fifth of the total income of farm households located in rural areas (both adjacent and nonadjacent) came from farming in 2003, indicating a high level of dependence (85%) on off-farm work even here (see Focus Figure XIV.32). The total household incomes of these farms are on par with all United States households. It is also interesting to note that between 1999 and 2003 the increase of $10,000 in total average income was attributed solely to off-farm sources of income.

Farm households in metro areas (central city, fringe, medium metro, and small metro) have the highest level of income ($74,000) among farms by location, and 89% of this income is derived through off-farm sources (mostly wages and salaries). In these households, both the farm operator and the spouse tend to work off-farm.

Farm households located in urban (adjacent and nonadjacent) areas tend to be similar - they have some income from farming but off-farm income again is the major contributor to total household income (see Focus Figure XIV.32). These results reaffirm that location and composition of income in a farm household are related. Still, farm households in remote rural areas depend heavily on off-farm employment.

Wealth for farm households in different locations follows the same pattern as income. Farm households in or near a metro area had the highest level of wealth (a net worth of $650,120 in 1999), one-third from non-farm sources. These farm households also had the highest farm assets and lowest farm debt. This suggests they may be full-owners renting land and machinery to part-owners and tenants. At the other extreme, farm households in rural areas have one-fourth of their net worth in off-farm assets. Rural farm households had the highest farm debt and considerable farm assets ($378,665) in 1999.

(vii) Comparing farm and non-farm income and wealth

In general, farm and non-farm household income are similar at several points within the overall distribution. Average incomes are similar for non-farm and farm households, though farm household income is more dispersed - larger shares of farm households have negative income and have incomes above $200,000. On the other hand, average wealth for farm households is substantially greater than for non-farm households, and is less dispersed.

(viii) Farm households save more, spend less than non-farm households

Expenditure levels represent an alternative indicator of economic well-being. While household income and wealth measured in any particular year are affected by contemporary economic conditions, the level of household expenditures is affected by the household's beliefs about total income and wealth over a lifetime. Household spending can exceed income by borrowing or liquidating financial capital. One would expect this to occur most at very low levels of income.

For both farm and non-farm households, spending tended to increase with income level, over much of the income distribution. However, the data show that farm household expenditures tend to be lower than non-farm household expenditures, even when controlling for differences in income, age, location, and size of population. Data for 2003 show that the exception was at low levels of income (below $15,000), where farm households tended to consume more than non-farm households (see Focus Table XIV.30). It is likely that many farms in this category had experienced temporary dips in their incomes to particularly low levels due to weather or other factors, and used their assets to support consumptions at their “normal,” higher level.

Expenditures for farm and non-farm households increase with age through the age group 45-54, and then decline, tracking the earnings profile among farm households. Income exceeds expenditures by the most for the 45-54 age group.

Farm and non-farm households had comparable expenditure profiles across the different household sizes. In general, households with more members had greater expenditures, although a plateau was reached at about four members for non-farm households and was still rising at five members for farm households.

The trend for farm household expenditures to be lower than non-farm household expenditures is sustained by simple summary analysis. For example, farm households may more readily categorize their expenses as business versus personal household expenses. As such, non-farm households may be required to assume more transportation and work-related expenses directly relative to farm households, whose expenses are often commingled with the business. Farm households may also be able to spend less by providing a portion of their own consumption from their farm. Although food is the most obvious savings, in some parts of the country a farm's oil and gas expenses are waived in return for resource extraction agreements with utilities. Or perhaps farm households choose to save, rather than consume, a greater portion of their income as a form of self-insurance against greater income variability, to service their debt, or for inter-generational transfers to help their son or daughter get a start in farming. The greater savings may be invested into the farm or some other business, or saved in more liquid accounts.

(ix) Main findings and policy implications

The data above draw a picture of farmers' well-being in the context of income, wealth, and consumption at the household level. They also compare the economic status and well-being of farm operator households within the farm sector and relative to all United States households. The main findings of this analysis are:

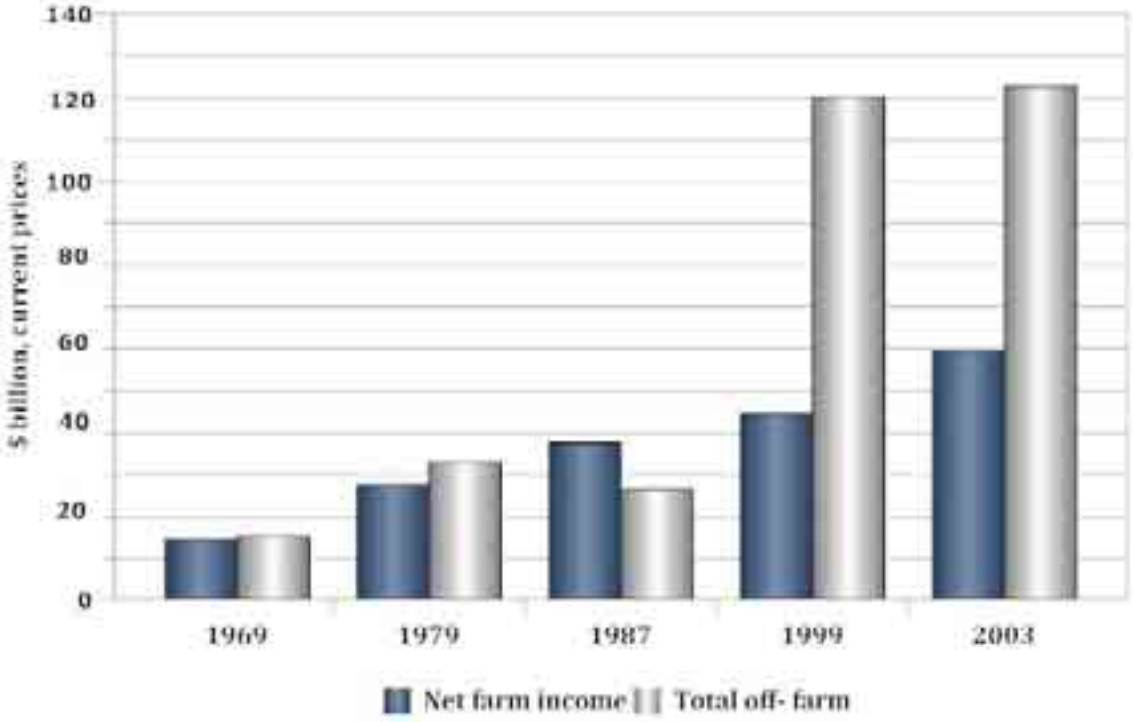
- Farm households are no different from other households in being pluriactive, pursuing multiple careers and diversifying earnings.
- The farm business as a source of income has become increasingly less important to farm households, especially among farms with sales of less than $250,000 per year, which make up over 90% of all farms.
- For most non-farm proprietorship households, the business is the main source of income; in contrast, for most farm proprietorship households, the farm detracts from total household income.
- While farm income exhibits considerable variability, farm **household** income is more stable.
- The average wealth of farm households has increased, and farm households have broadened their investment portfolio to include more non-farm components.
- While the life cycle is a dominant influence on differences in the level and source of household income and wealth, other contributing factors include farm type and size, operator education, farm tenure, and household size.
- Average incomes are similar for farm and non-farm households, but farm household income is more dispersed.
- Farm household wealth is considerably greater on average than non-farm household wealth, and is less dispersed.
- The conventional wisdom that farm households are financially disadvantaged compared with other United States households does not hold.

Results of the joint income and wealth analyses, comparing farm households to the median of all United States households, revealed that in 1999:

- 2.6% had higher incomes and lesser wealth
- 6.0% had both lower income and wealth
- 42.6% had lower income but higher wealth
- 48.7% had both higher income and wealth

On average, farm households have higher incomes, greater wealth, and lower consumption expenditures than all United States households. Incomes of farm households are, on average, sufficient to support a standard of living (defined as meeting consumption and basic household needs) that either is comparable to or exceeds that for all United States households. No longer do farm households inhabit one all-defining group that is considered either disadvantaged or without problems.

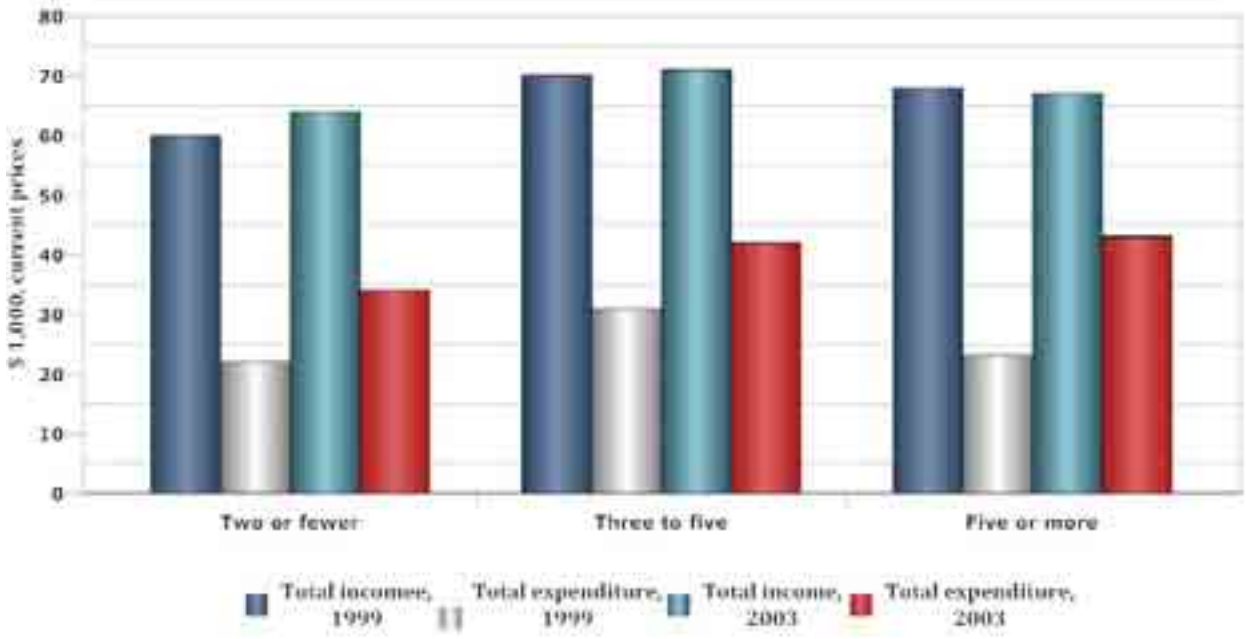
FOCUS FIGURE XIV.26
Sources of income in the agriculture sector



YEAR	NET FARM INCOME	TOTAL OFF-FARM INCOME	NET FARM INCOME AS A PERCENTAGE OF TOTAL INCOME
	$ billion, current prices		
1969	14.3	15.1	48.6
1979	27.4	32.8	45.5
1987	37.4	26.2	58.8
1999	44.3	120.1	26.9
2003	59.2	122.6	32.6

Source: Economic Research Service of US Dept. of Agriculture

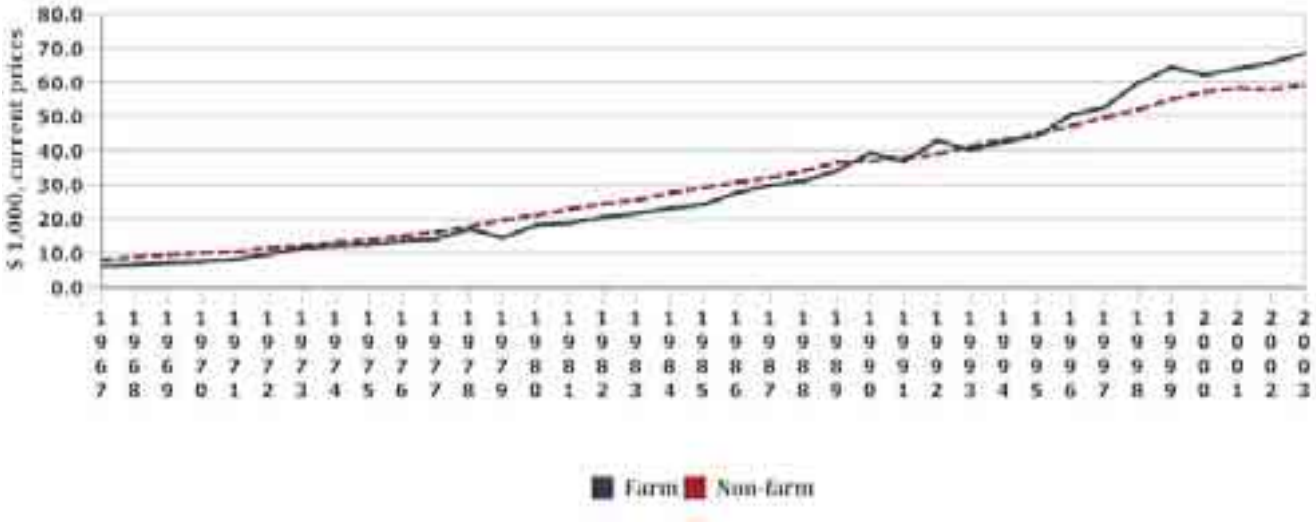
FOCUS FIGURE XIV.27
Total income and expenditure per operator household, by household size, 1999 and 2003



Household size	Total income, 1999 $ 1,000	Total expenditures 1999 $ 1,000	Total income, 2003 $ 1,000	Total expenditures, 1999 $ 1,000	Net diff. 1999 $ 1,000	% income 1999	Net diff. 2003 $ 1,000	% income 2003
Two or fewer	60	22	64	34	38	**63.3**	30	**46.9**
Three to five	70	31	71	42	39	**55.7**	29	**40.8**
Five or more	68	23	67	43	45	**66.2**	24	**35.8**

Source: Economic Research Service of US Dept. of Agriculture

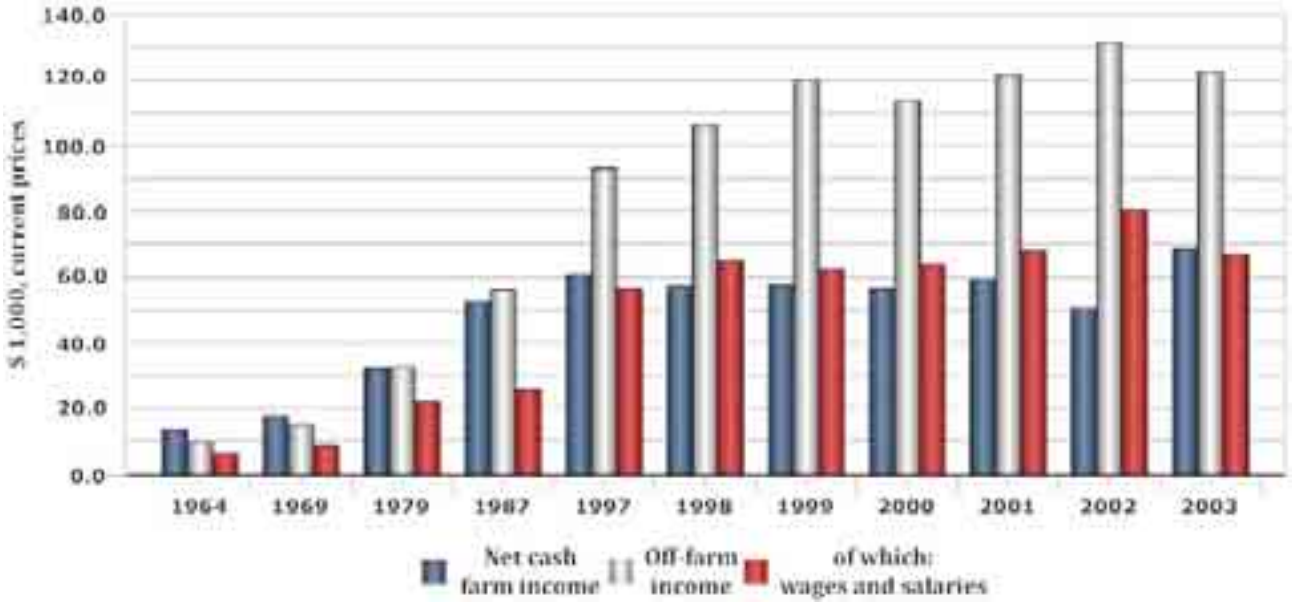
FOCUS FIGURE XIV.28
Average income of farm and non-farm households, 1967-2003, in $1,000 current prices



$ 1,000 current prices										
	1967	**1968**	**1969**	**1970**	**1971**	**1972**	**1973**	**1974**	**1975**	**1976**
Farm	6.191	6.526	7.244	7.519	8.206	9.629	11.442	12.041	12.048	13.539
Non-Farm	7.989	8.76	9.544	10.001	10.383	11.286	12.157	13.094	13.779	14.922
	1977	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**
Farm	14.111	17.016	19.499	18.123	18.842	20.382	21.534	23.013	24.119	27.56
Non-Farm	16.1	17.73	19.554	21.063	22.787	24.309	25.401	27.464	29.006	30.759
	1987	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**
Farm	29.822	31.155	34.156	39.269	39.839	42.911	40.223	42.469	44.392	50.361
Non-Farm	32.144	34.017	36.52	37.103	37.922	38.84	41.428	43.133	44.938	47.123
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**			
Farm	52.562	59.734	64.347	62.223	63.983	65.761	58.506			
Non-Farm	49.693	51.855	54.842	57.135	58.208	57.852	59.067			

Source: Economic Research Service of US Dept. of Agriculture

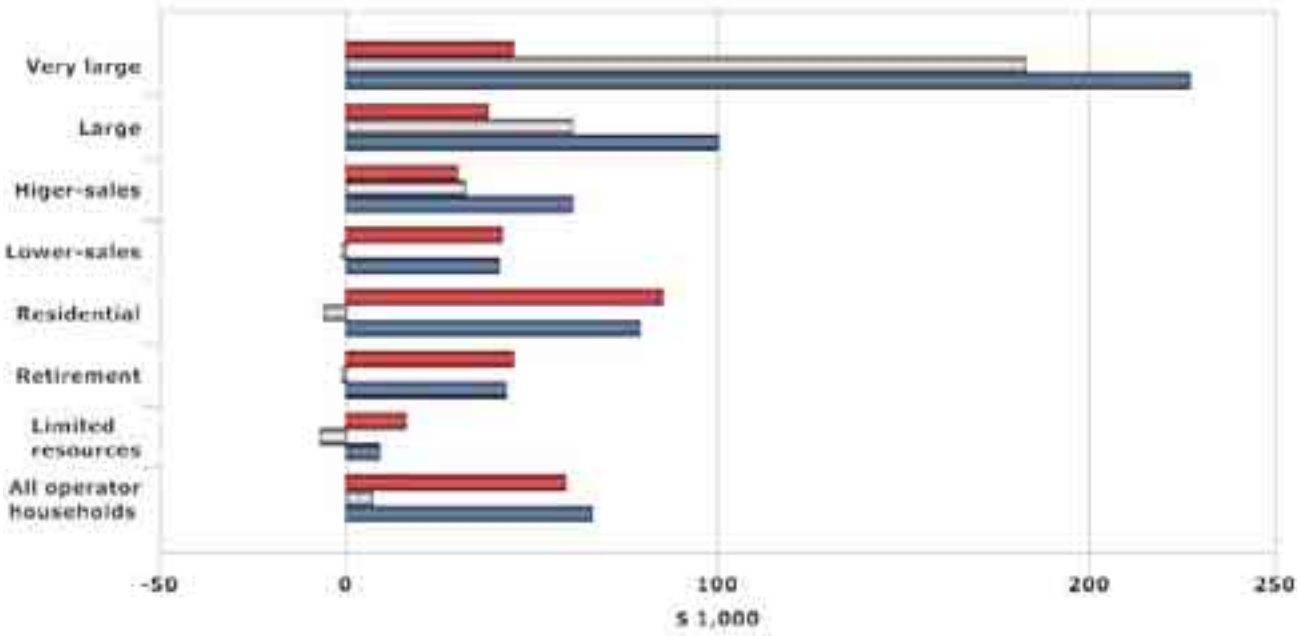
FOCUS FIGURE XIV.29
Farm sector net cash income and income of farm households from off-farm sources, 1964-2003, in $ billion, current prices



$ BILLION, CURRENT PRICES	1 NET CASH FARM INCOME	2 OFF-FARM INCOME	3 OF WHICH : WAGES AND SALARIES	4 1 IN % OF (1+2)	5 3 IN % OF 2
1964	13.6	10.0	6.5	57.6	65.0
1969	17.8	15.1	8.8	54.1	58.3
1979	32.6	32.8	22.3	49.8	68.0
1987	52.6	56.3	26.2	48.3	46.5
1997	60.9	93.3	56.7	39.5	60.8
1998	57.3	106.4	65.2	35.0	61.3
1999	57.8	120.1	62.5	32.5	52.0
2000	56.7	113.9	63.9	33.2	56.1
2001	59.6	121.7	68.0	32.8	55.9
2002	50.7	131.6	80.0	27.8	61.4
2003	68.6	122.6	67.0	35.9	54.6

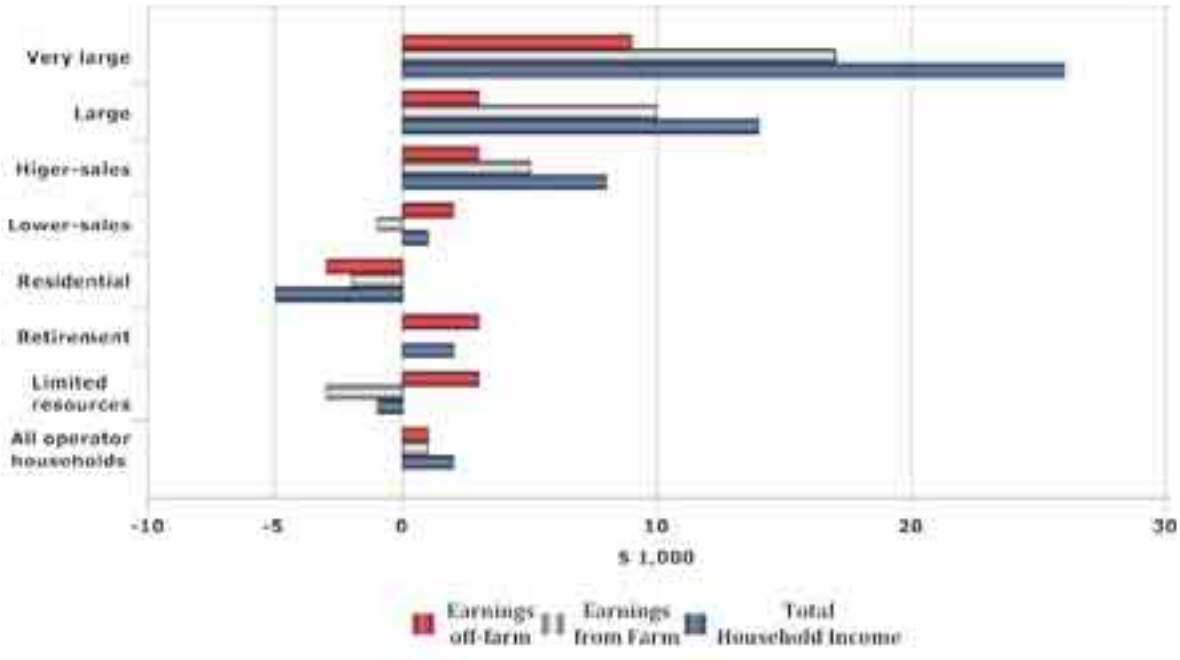
Source: Economic Research Service of US Dept. of Agriculture

FOCUS FIGURE XIV.30
Total farm-related and off-farm income per household, by farm typology group, 2003, in $ 1,000



Source: Economic Research Service of US Dept. of Agriculture

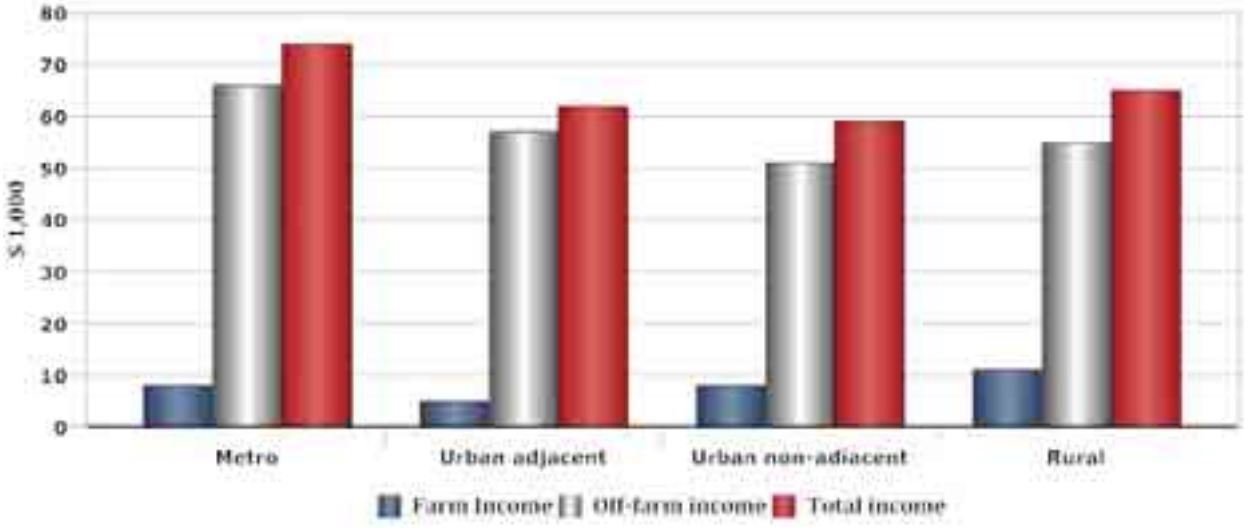
FOCUS FIGURE XIV.31
Total farm-related and off-farm income per household, by farm typology group, difference between 2003 and 1999, in $ 1,000

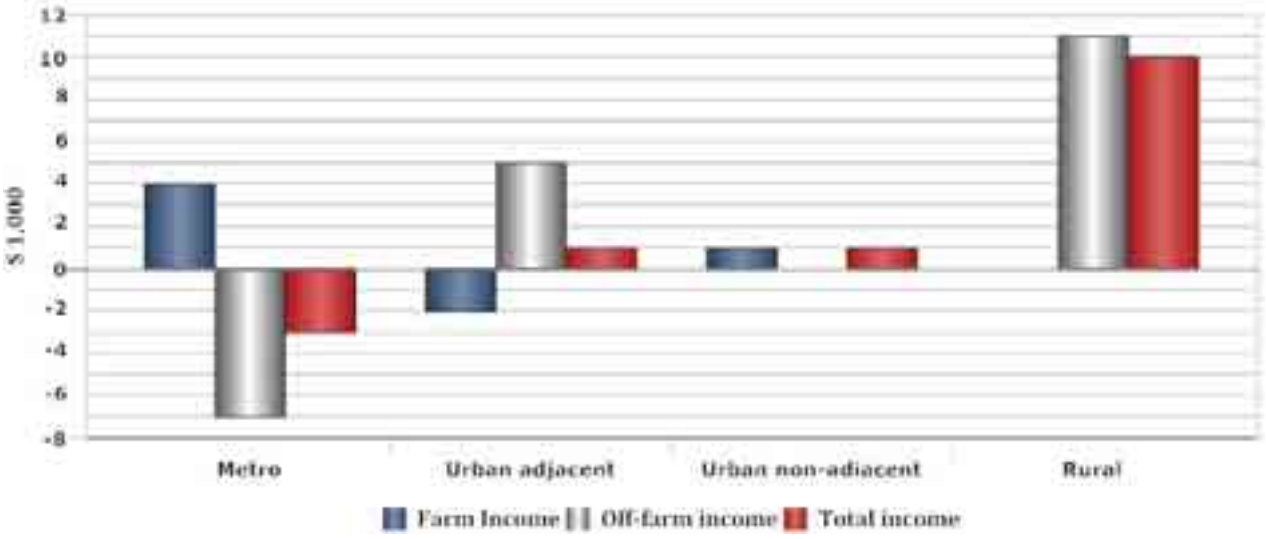


Source: Economic Research Service of US Dept. of Agriculture

$ 1,000	2003			DIFFERENCE 2003-1999		
	TOTAL HOUSEHOLD INCOME	EARNINGS FROM FARM	EARNINGS OFF-FARM	TOTAL HOUSEHOLD INCOME	EARNINGS FROM FARM	EARNINGS OFF-FARM
All operator households	66	7	59	2	1	1
Limited resources	9	-7	16	-1	-3	3
Retirement	43	-1	45	2	0	3
Residential	79	-6	85	-5	-2	-3
Lower-sales	41	-1	42	1	-1	2
Higher-sales	61	32	30	8	5	3
Large	100	61	38	14	10	3
Very Large	227	183	45	26	17	9

FOCUS FIGURE XIV.32
Total, farm-related and off-farm income per household, by farm location, 2003 and increase 1999-2003, in $ 1,000





$ 1,000	2003			DIFFERENCE 2003-1999		
	FARM INCOME	OFF-FARM INCOME	TOTAL INCOME	FARM INCOME	OFF-FARM INCOME	TOTAL INCOME
Metro	8	66	74	4	-7	-3
Urban adjacent	5	57	62	-2	5	3
Urban non adjacent	8	51	59	1	0	1
Rural	11	55	65	0	11	10

Source: Economic Research Service of US Dept. of Agriculture

FOCUS TABLE XIV.30
Income and expenditures for farm and non-farm households by income class, 1999 and 2003, $

	Less than $5,000	$5,000 to $9,999	$10,000 to $14,999	$15,000 to $19,999	$20,000 to $ 29,999	$30,000 to $ 39,999	$40,000 to $49,999	$50,000 to $69,999	More than $70,000
1999									
Farm household expenditures	20,611	13,345	13,294	15,215	19,093	20,781	21,930	24,464	35,178
Farm household income	-30,316	7,578	12,518	17,408	24,810	35,105	44,823	59,122	158,036
Income less expenditures	*-50,927*	*-5,767*	-776	*2,193*	*5,717*	*14,324*	*22,893*	*34,658*	*122,858*
Non-farm household expenditures	17,983	14,921	*19,710*	24,367	28,916	35,048	40,826	49,606	76,742
Non-farm household income	1,633	7,631	12,338	17,311	24,467	34,353	44,321	58,479	113,441
Income minus expenditures	-16,350	-7,290	-7,372	-7,056	-4,449	-695	3,495	8,867	36,699
2003									
Farm household expenditures	25,534	20,781	22,467	22,610	25,991	31,223	31,844	34,428	54,827
Farm household income	-30,142	7,703	12,578	17,398	25,048	35,177	44,514	59,111	155,319
Income less expenditures	*-55,676*	*-13,078*	*-9,889*	*-5,212*	*-943*	*3,954*	*12,670*	*21,683*	*100,492*
Non-farm household expenditures	17,453	15,245	19,344	22,923	28,196	33,794	39,531	48,281	74,912
Non-farm household income	1,200	7,799	12,455	17,410	24,655	34,485	44,294	58,900	117,960
Difference 2003-1999									
Farm households expenditures	9,923	7,436	9,173	7,395	6,898	10,442	9,914	12,964	19,649
Farm household income	174	125	60	-10	238	72	-309	-11	-2,717

Source: Economic Research Service of US Dept. of Agriculture

FOCUS TABLE XIV.31
Income and expenditures for farm and non-farm households by age class, 1999 and 2003, $

1999	Under 35	35 to 44	45 to 54	55 to 64	65 and over
Farm household expenditures	21,965	25,864	28,112	24,744	18,895
Farm household income	74,831	64,826	86,194	63,784	39,625
Income less expenditures	*52,866*	*38,962*	*58,082*	*39,040*	*20,730*
Non-farm household expenditures	31,866	42,792	46,511	39,394	26,521
Non-farm household income	35,286	53,579	59,822	49,436	26,581
Income less expenditures	*3,420*	*10,787*	*13,311*	*10,042*	*60*
2003					
Farm household expenditures	32,685	38,604	40,754	42,093	27,723
Farm household income	49,939	76,617	76,482	80,522	48,986
Income less expenditures	*17,254*	*38,013*	*35,728*	*38,429*	*21,263*
Non-farm household expenditures	35,063	47,037	50,254	49,996	29,167
Non-farm household income	41,384	61,091	68,028	58,672	30,437
Difference 2003-1999					
Farm households expenditures	10,720	12,740	12,642	17,349	8,828
Farm household income	-24,892	11,791	-9,712	16,738	9,361
Income less expenditures	*-35,612*	*-949*	*-22,354*	*-611*	*533*

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Focus on Income and Wealth Statistics for the European Union

(i) The section focuses on sector-level estimates based in national accounts that were published by Eurostat from the early 1990s to 2001

In the late 1980s Eurostat set up a methodology for estimating the income of agricultural households, based in national accounts as the primary source rather than on microeconomic data from surveys or registers. Initially known as Total Income of Agricultural Households (TIAH), theses statistics were renamed Income from Agriculture Household Sector (IAHS) statistics. Though they were suspended in 2002 for a mix of reasons that included lack of progress among some Member States, questions about the consistency of results between countries, and the recognition that a microeconomic approach held greater promise both for consistency and the ability to service policy needs, it is worth noting some of the main results.

These statistics for the agricultural households (sub) sector were established with the objectives of

- monitoring the year-on-year changes in the total income of agricultural households at the aggregate level in Member States;
- monitoring the changing composition of income, especially the proportions of income from the agricultural holding and from other gainful activities, from property and from welfare transfers;
- comparing the trends in the total income of agricultural households per unit (household, household member, consumer unit) with that of other socio-professional groups;
- comparing the absolute income of farmers with that of other socio-professional groups, on a per unit basis.

The main concepts in the IAHS methodology (Eurostat 1995) are described in the box below.

The main aggregate income concept used in the IAHS project was **Net disposable income,** adapted from national accounts methodology (see also Chapter IX). This concept included not only income from farming and from other gainful activities, but also from pensions and other forms of transfer. The value of farm-produced goods consumed by agricultural households and the rental value of the farmhouse were treated as positive components of income. Elements deducted included current taxes and social contributions. .

Income and households: concepts and definitions

Income: the main concept was household **net disposable income**, that included all income from independent activity (self-employment), dependent activity (employment), property, social and other transfers, and was after the deduction of items such as current taxes, social contributions and other payments. It was expressed in aggregate, per household, per household member and per consumer unit.

Household: the household included all members living together (this varied in detail between Member States), and included, in agricultural households, both those who worked on the agricultural holding and those who did not.

An agricultural household ("narrow" definition) was one where the main income of the household reference person (typically the head of household) was from independent activity in agriculture (farming). A range of other socio-professional groups could be established on the same basis for the purpose of comparison. A second, supplementary, "broad" definition of an agricultural household included all households where any member had some income from independent activity in agriculture.

In the IAHS methodology, a household was defined as in national Family Budget Surveys. Although there are small differences between Member States these definitions typically include all members who live under the same roof and share meals. Consideration was also given to an alternative household concept - the single budget household - that excluded persons who are financially independent, such as grown-up children of the farmer and spouse who still live at home but who work full-time off the farm. However, it did not prove possible to make income estimates on this basis because of data problems in many Member States. In order that households of different sizes and compositions could be brought together for income analysis purposes, incomes were expressed per household member and per consumer unit, the latter using coefficients (in the form of an equivalence scale) to express children and additional adults in terms of consumer units. Small variations in the scales used were found between Member States (which may reflect real differences in socio-economic conditions between countries), but in practice most Member States adopted a standard set of coefficients; typically the head of the household counted as 1 unit, additional adults 0.7 units, and children as 0.5 units. It is important to note that households of farmers, defined in this way, may have included persons who contributed no labour input to the agricultural holding.

The most significant part of the IAHS methodology, and one which can have a substantial effect on the results, was the system used for **classifying households as agricultural or belonging to some other socio-professional group**. Reflecting both theoretical and practical considerations, for the purpose of classification in IAHS statistics, households were allocated to socio-professional groups on the basis of the main source of income of the reference person (typically the head of household or the largest contributor to the household budget). Thus an agricultural household was one in which the main source of income of the reference person was from independent activity in agriculture[1]. In the context of the IAHS statistics this definition of an agricultural household was labelled "**narrow**" since it excluded those households where farming was not the main income of the reference person (or the person's main occupation). It should be noted that households headed by hired workers in the agricultural industry were not included within the agricultural household group when defined in this way.

(ii) An overview of results

The IAHS statistics were never at the same level of development throughout the European Union (EU15). Full harmonization in the methodology was not achieved and there were gaps in the data. In terms of length of series, at one extreme was Germany, where annual figures for the period 1972-1993 were held in Eurostat's IAHS database, broken down within the framework of national accounts into socio-professional groups, of which agricultural households formed one. At the other extreme were countries for which only a single year was represented in the database, such as Luxembourg (1989), or a larger number where comparable figures for non-agricultural households were not broken down into their constituent socio-professional groups. Results should therefore be regarded as indicative and, in the case of some countries, experimental.

[1]Where possible, the group of agricultural households should not include forestry or fishing households.

(iii) Main findings

Despite the lack of harmonization in IAHS statistics, gaps in the years covered and the general criticisms of their sector-level approach that led to the series being suspended, some broad findings can be drawn that are policy-relevant. A summary is given below; some are based on results from all Member States while others depend on the greater quantity of information available in a minority of countries but which, nevertheless, are likely to be found throughout the EU.

1. The number of agricultural households (those where the main income of the reference person came from farming) was substantially smaller than the number of households where there was **some** income from farming, and generally smaller than the number of agricultural holdings.
2. Where data existed over time, absolute numbers of agricultural households had been falling, in some instances very rapidly. The fact that results did not relate to a constant set of households must be borne in mind when interpreting changes in incomes per household over time.
3. Agricultural households (defined as above) in all EU-15 countries were recipients of substantial amounts of income from outside agriculture. Though typically about a half to two thirds of the total came from farming, there were large differences between Member States and some differences between years.
4. The total income of agricultural households was more stable than their income from farming alone. Non-agricultural income (taken together) was less variable from year to year than was farming income. Disposable income seemed to be less stable than total income, but the relationship between the two depended on a variety of factors, including the way that taxation is levied.
5. Agricultural households had average disposable incomes per household that were typically similar to, or higher than, the all-household average, although the relative position was eroded or reversed when income per household member or per consumer unit was examined.
6. On average, households with an agricultural holding but where farming was **not** the main income source of the reference person appeared to derive little income from farming; their average disposable income could be greater or smaller than incomes of agricultural households, depending on the country in question.

The rest of this section concentrates on four of the possible areas of analysis - the implications of applying the IAHS definition of what constitutes an agricultural household on the numbers of households covered, the composition of the total income of these agricultural households, the relative stability over time of the income from farming and total income, and comparisons of average disposable income between agricultural households and the entire households sector.

(iv) Numbers of agricultural households

In most countries, the number of households that satisfied the IAHS definition of an agricultural household was much smaller than the number of holdings shown in the Community survey on the structure of agricultural holdings. In 1987, the number of agricultural households for the European Union as a whole (EU-12) appeared to be less

than half the number of holdings. In some countries (notably Italy, Spain, Portugal and Denmark) the number of agricultural households was particularly low in relation to the number of holdings, implying that on two-thirds or more of holdings there were no households whose reference person (head) had farming as the main income source (or occupation). However, on some (typically large) holdings there could be more than one agricultural household. This and other technical factors helped explain why in the United Kingdom the numbers of holdings and agricultural households were almost the same, despite the known existence of many smaller holdings where no household could satisfy the definition of being an agricultural one.

Due to the non-correspondence between agricultural holdings and households, a preferable approach is to compare the numbers of households that satisfy the target "narrow" definition with those of households where at least one member of the household has some income from farming (that is, the target "broad" definition). This also throws some light onto the households that are outside the former definition but inside the latter, which might be called "marginal" agricultural households. Only seven countries provided such information (Denmark, Germany, Greece, Ireland, Netherlands, Finland and Sweden), and mostly for only one year, so caution must be exercised in interpreting the findings[2]. In each country, whilst the use of the "narrow" definition reduced the number of agricultural households compared with the numbers which qualified under the "broad" definition, the extent varied substantially; the number of "narrow" households as a percentage of "broad" households ranged (in ascending order) from 33% in Denmark (1996), 41% in Ireland (1987), 53% in Finland (1992), 57% in Sweden (1992), 58% in Germany (1983), 60% in the Netherlands (1988), and 65% in Greece (1994). Further consideration of the "marginal" agricultural households is given later in this section.

In countries where IAHS results were available for a run of years on a comparable basis, it is clear that the number of agricultural households had been in decline. In Germany (as constituted before October 1990) the fall was from 349,000 households in 1984 to 261,000 in 1993 (-25%, or an annual average decline of 3.2%) against an overall rise (+13%) in the total number of private households. In France, farm household numbers fell even faster, with a fall of 27% (or 3.9% annually) in the number of agricultural households in the seven-year period 1984-90. This was against a background of a 7% increase in the total number of households. In the following five years, the disparities were even greater; the number of agricultural households fell by another 25% (or 5.5% annually) whilst the number of households as a whole increased 7%. In Portugal, the fall in agricultural household numbers between 1980 and 1989 was 37% (or an average decline of 4.9% per year). Interpretations of income movements over time must recognise that the agricultural households group is not of a constant composition but is changing and contracting.

(v) Composition of income of agricultural households, and deductions

IAHS statistics showed that, in all countries, agricultural households ("narrow" definition) were recipients of substantial amounts of income from outside agriculture. Typically only about a half to two-thirds of the households' total income came from

[2]Some other countries (Spain and Austria) do have definitions for the household that are broader than the "narrow" definition but are not the target "broad" definition.

farming, though there were substantial differences between Member States (see Focus Figure XIV.33) and for individual countries over time. In the periods shown (three-year averages ending in the latest available year or, where this was not possible, single years), countries in which substantially less than half of the total household income came from farming were Germany, Finland and, most notably, Sweden (where only a quarter of total income came from farming in the three years centred on 1996). At the other end of the spectrum, with more than three-quarters (78%) coming from farming but still with a substantial minority of their income coming from other sources, was the Netherlands. There was substantial variation between years for some countries, reflecting, in particular, changes in the income from farming. For example, in Germany the share of the total coming from farming declined from 43% in 1991 through 39% in 1992 to 30% in 1993, a change clearly linked to the drop in earnings from farming. On the other hand, a fall in Finland from 41% in 1993 to 33% in 1994 was largely explained by an almost three-fold increase in income from other independent activity (largely forestry); in subsequent years this fell back somewhat and income from farming increased (the share coming from farming stabilizing around 34%). Such sharp short-term changes, however, do not significantly affect the validity of the general conclusion.

The second most important source of income of agricultural households was usually wages or social receipts; in the United Kingdom it was property income. Income from other forms of independent (self-employed) activity, such as operating other (non-agricultural) businesses, was generally unimportant, except in Finland where farm-forestry appeared to provide the explanation. However, there may have been some under-representation of other forms of independent activity because data sources (such as taxation statistics) may not reflect the extent to which they were carried out within the framework of what was primarily a farm business.

Countries also differed in the amounts of household income taken in taxation and other deductions, so that the same average total income figure can imply different levels of disposable income in different Member States. At one extreme were Denmark, Germany and Sweden where a quarter or more (on average) of an agricultural household's income was taken as taxes and social contributions in the latest period for which results are available. At the other extreme were Portugal and Greece, where less than 5% was taken.

Of course, these differences reflected national policies on taxation for which there may have been a counter-provision of goods and services provided in the form of social benefits. Only some of these were captured in the measurement of Net Disposable Income. For example, the provision of individual non-market goods or services (such as education and health services) was not covered (though they are in the concept of Net Adjusted Disposable Income). Consequently, the net effect on consumption was impossible to assess without more detailed information.

Another general finding was that, in many countries, the proportion of total income taken by current taxes and social contributions was lower (often much lower) among agricultural households than among households in general. Denmark, Germany and Sweden were the exceptions, where agricultural households had shares taken which were above or very close to the national averages. However, no conclusions could be drawn as to the relative burdens of taxation without much more information on the

levels and distributions of income, and details of the tax regimes applied to income from self-employment in general and agriculture in particular vis-à-vis income from employment and other sources.

(vi) Stability of income of agricultural households

There is evidence from several Member States that the total household income for agricultural households was more stable than their income from farming alone. Non-agricultural income (taken all together) was less variable from year to year than was farming income (though this was not a necessary condition for total income to be more stable). Disposable income seemed to be less stable than total income; a variety of factors seemed to be operating here, including the way that taxation was levied. The implication is that the year-to-year movements in indicators of the income from agricultural activity should not be taken to imply movements of the same proportion in the total income of agricultural households. These are likely to be smaller.

Focus Figure XIV.34 shows the change in income (from farming and total income) between the beginning and end of similar periods. For all countries other than Finland and Sweden, the percentage change in total income was smaller than the percentage change in income from farming alone and the change was always in the same direction. In Finland and Sweden, the falls in farming income were more than offset by rises in other sources, so total income rose. This pattern is consistent with the above observation, and again illustrates the point that changes in farming income are not necessarily a good guide to changes in overall household income.

(vii) Comparisons of the income of agricultural households with the all-households average

IAHS results, taking three-year averages where possible (see Focus Figure XIV.35), indicated that, for most Member States, the average net disposable income of agricultural households was close to or higher than the all-households average (comparisons were not possible for all countries). The main exception was Portugal, where it was much less (less than half). Somewhat lower levels were also found in Greece (86%) and Italy (90%)[3]. The relative position was eroded when income per household member or per consumer unit was examined. Nevertheless, on all three measures (per household, per household member and per consumer unit) agricultural households had incomes at or above the national averages in France, Ireland, Luxembourg and (most notably) the Netherlands[4]. However, agricultural households on average usually had incomes lower than households headed by other self-employed reference persons in the same Member State.

Again, some large short-term fluctuations can be observed. The relatively low income position of agricultural households in Germany (not including the area of the former GDR) in 1993 reflected a sharp decline in incomes from farming compared to 1992 (when the disposable income per household had been 99% of the all-households average); 1992 was itself the end of a four-year period in which agricultural households

[3]Data for Greece is not included in the table.

[4]Income per household member for Luxembourg is not available.

had disposable incomes substantially above the national all-households average. Finland, in contrast, saw a rise in the relative position of agricultural households (from 131% of the all-households average in 1992 to 170% in 1994), the result of a growth in income not from agriculture but, in this case, from other forms of self-employment. In subsequent years this has fallen back somewhat (to between 141% and 152%). Only in Greece, Italy and, in particular, Portugal were farmer households consistently and substantially below the all-households average.

These results do not suggest that agricultural households were a particularly disadvantaged group in terms of their average disposable incomes, a major finding in the light of the objectives of agricultural policy in the European Union. In investigating whether there was a low-income problem, other factors needed to be considered, including the distribution of incomes around the group mean. And it should be recalled that, despite the stabilising influence of income from sources other than farming, the relative position of agricultural households can be subject to quite large short-term variations.

(viii) Comparison with other socio-economic groups

Focus Table XIV.32 shows that although agricultural households, in some countries, had net disposable income that exceeded that of the average household in general, they quite substantially trailed the "other self-employed" group in all countries (except the Netherlands). Moreover, with the exception of Finland and the Netherlands, agricultural households had a lower average disposable income than the "employee" household group in all countries.

The extraordinary level of disposable income among farm households in the Netherlands should be noted. It was more than three times that of the average households and 2.6 times that of all other self-employed households. This was likely to reflect the fact that agricultural and horticultural businesses in the Netherlands were typically large and represented very substantial capital sums. Hence, the income received will be a hybrid of rewards to the farmer's entrepreneurial and physical labour and to the capital and land that he/she owns. Therefore it is not surprising that, where net worths were high, the total income generated by the business was also high. It is not unreasonable to measure such income as it will be at the disposal of the farm household to spend on consumption, to save or invest in the business or in other ways.

Another result to be noted is that of Finland where agricultural households had 50% higher average disposable income than the all-average household and almost at the same level as other self-employed households. Compared with neighbouring countries like Denmark and Sweden, the result in Finland was striking. There may have been fundamental differences that helped explain the differences between Finland and Denmark and Sweden, including the rather unusual (by international standards) practice in Denmark of transferring farms between generations by means of sales using credit facilities set up with this in mind. The exceptionally high interest charges faced by younger farmers has for long been a feature in Denmark, and this may feed though to lower disposable incomes.

However, there are also likely to be small but by accumulation significant differences in definitions. For example, the definition of a household used in Sweden related only to the core of a couple and dependent children, whereas in Finland it covered all persons resident at the same dwelling, which resulted in a higher income per household. In countries where single-person households may be significant in determining the national average household income, these differences in the definition of household when applied to the agricultural sector may have resulted in the sorts of situation described. Clearly there is a need to exercise caution when using any statistics and not to go beyond their capacity to inform. This is particularly the case in drawing international comparisons where harmonisation is less than complete.

(ix) Income situation of "marginal" households

Reference has already been made to households where some member of the household has an income from independent activity in agriculture (that is, from farming) but where farming is not the main income source of the household reference person. As mentioned previously, in the Eurostat methodology this group was formed by subtracting those agricultural households defined as “narrow” from those agricultural households defined in the “broad” way. Among the Member States where information was available these “marginal” agricultural households accounted for more than a half of all the households with some farming income in Denmark and Ireland (72% in 1999 and 59% in 1987, respectively), and between about 40% and 50% in Germany, Greece, the Netherlands, Finland and Sweden. Despite their numerical importance, they accounted for only a relatively small proportion of the aggregate income derived from farming by agricultural households as a whole (see Focus Figure XIV.36). For most countries only between a fifth and a tenth of the entire sector’s income from independent activity was generated by “marginal” households. The figure was very small in Germany (8% in 1983) but rather higher under the unique circumstances found in Denmark (26% in 1999). Perhaps of even greater importance were the income characteristics of these “marginal” households and the impacts that they had on average income levels when a “broad” definition of an agricultural household was adopted (see Focus Table XIV.33).

In Denmark, Ireland, the Netherlands and Finland the average incomes per household of the “marginal” households were smaller than those of the agricultural households defined in the IAHS “narrow” way. In the first two countries they appeared to be a relatively low-income group, with incomes below the all-households average; in the Netherlands and Finland they were above it. However, in Germany and Greece the “marginal” households appeared to be a relatively high-income group. They had an average disposable income per household that was not only larger than that of agricultural households defined in the “narrow” way but was also substantially above the all-households average. In Sweden there was little difference between the various agricultural groups on a per household basis but they were all below the national all-households average.

When incomes were expressed per household member and per consumer unit, the income position of the “marginal” households deteriorated relative to the all-households average in Denmark, Greece, the Netherlands, Finland and (household members only) in Ireland (data on this basis were not available for Germany and Sweden). In Finland the

somewhat smaller sizes of the "marginal" households improved their incomes per household member and per consumer unit compared with the "narrow" group.

Such diversity among only seven countries pointed to the need for sets of income results to be available for both "narrow" and "broad" (and "marginal") agricultural household groups in each Member State. Differing social, economic and agricultural structures were likely to mean that countries needed to be considered individually and quick generalisations avoided.

However, a characteristic shared by all the countries from which evidence was available was that only a small proportion of the total income of "marginal" households came from farming. In Germany only 5% of "marginal" households income came from farming. Comparable figures were the Netherlands 8% (not updated since the special study of 1988), Finland 11%, Ireland 14%, Greece 17% and Denmark 12% (1999). It follows that changes in the income from independent agricultural activity were of relatively little significance to the total income of these households; their overall position is more likely to have been affected by changes in the economy in general (as these impact wages, often the major source of income) and policy on social benefits (another major source of income). Policies supporting farming incomes (for example, through instruments which raised the market prices of agricultural commodities) were therefore not likely to significantly improve the income situation of these households.

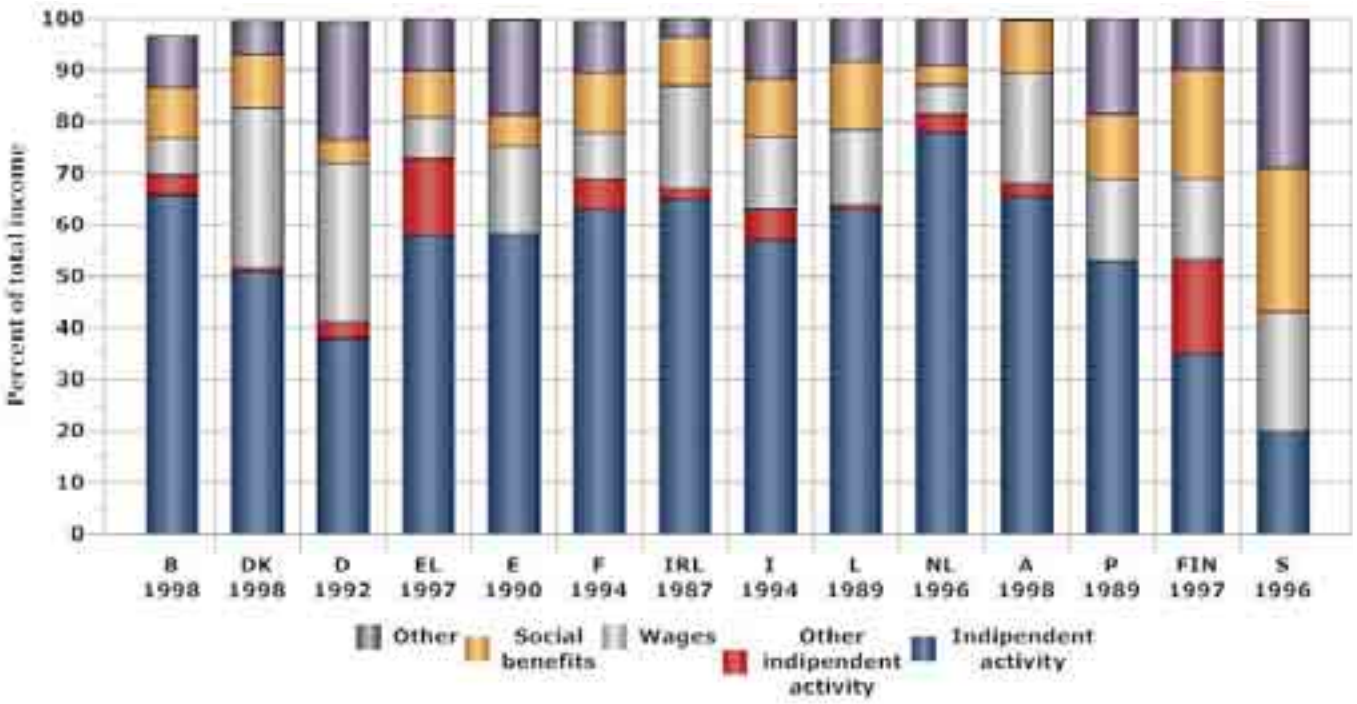
(x) Farm households "broad" definition compared to all households

In Focus Figure XIV.37 the average disposable income per farm household, according to the "broad" definition (that is, all those with some non-zero income from farming), and per household member, was compared with the income of the average household and household member. Unfortunately, the year for comparison was not only somewhat outdated but differed among the countries.

In all countries, except Sweden, the net disposable income per farm household was either on the same level (Denmark, 1999) or higher than the average for all households. In Sweden the farm household had an income of about 90% of that of the average household. Again, it can be seen that agricultural households in the Netherlands and Finland were much better off than the average household.

The picture changed when looking at disposable income per household member. Only in the Netherlands did the average farm household member have a disposable income that was higher than the average member of all households. However, in Greece and Ireland, members of agricultural households had more or less the same income level as members of all households.

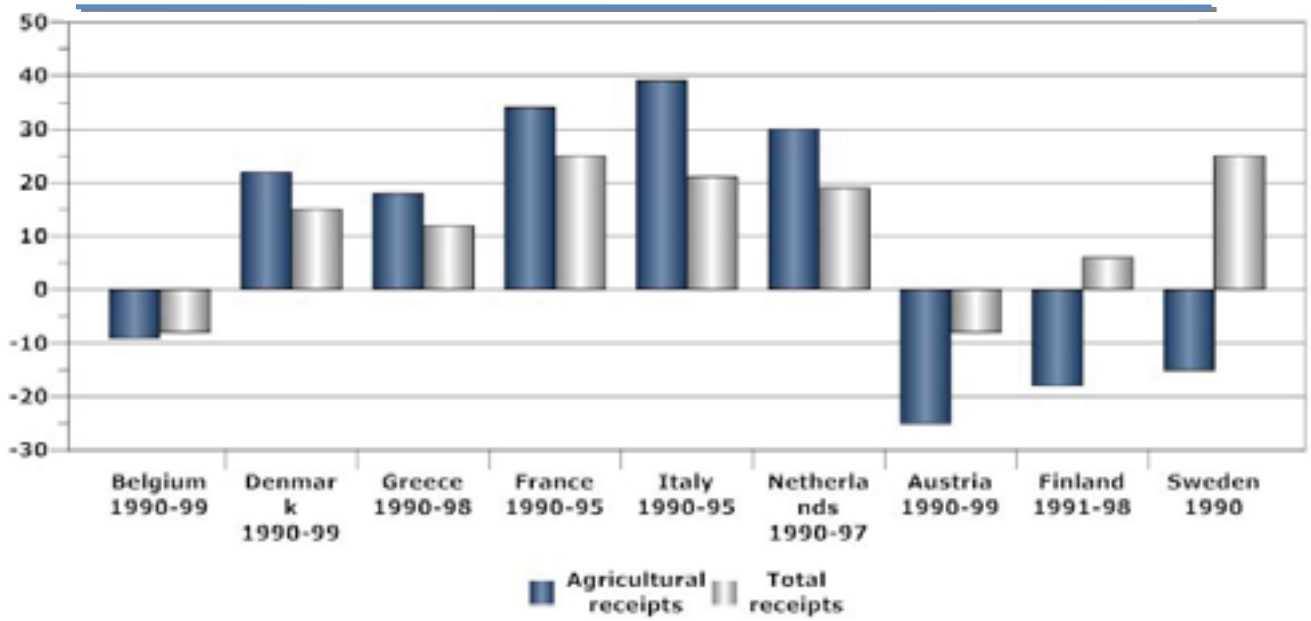
FOCUS FIGURE XIV.33
Composition of the total income of agricultural households by source, for selected Members State, per cent



(i)In Spain, Portugal and Sweden there is no subdivision of income from independent activity in agriculture and elsewhere.
(ii) Results for the Netherlands are based on the household as the unit of classification (rather than the reference person).
(iii) in France problems of comparability arise because of the way in which social contributions are treated.
(iv)In the UK the current data source does not cover households with holdings arranged as corporate business, and there are other statistical problems that should preclude direct comparisons with other Member States.
(v) "Others" includes income from property, imputed value of domestic dwelling, and other miscellaneous current transfers

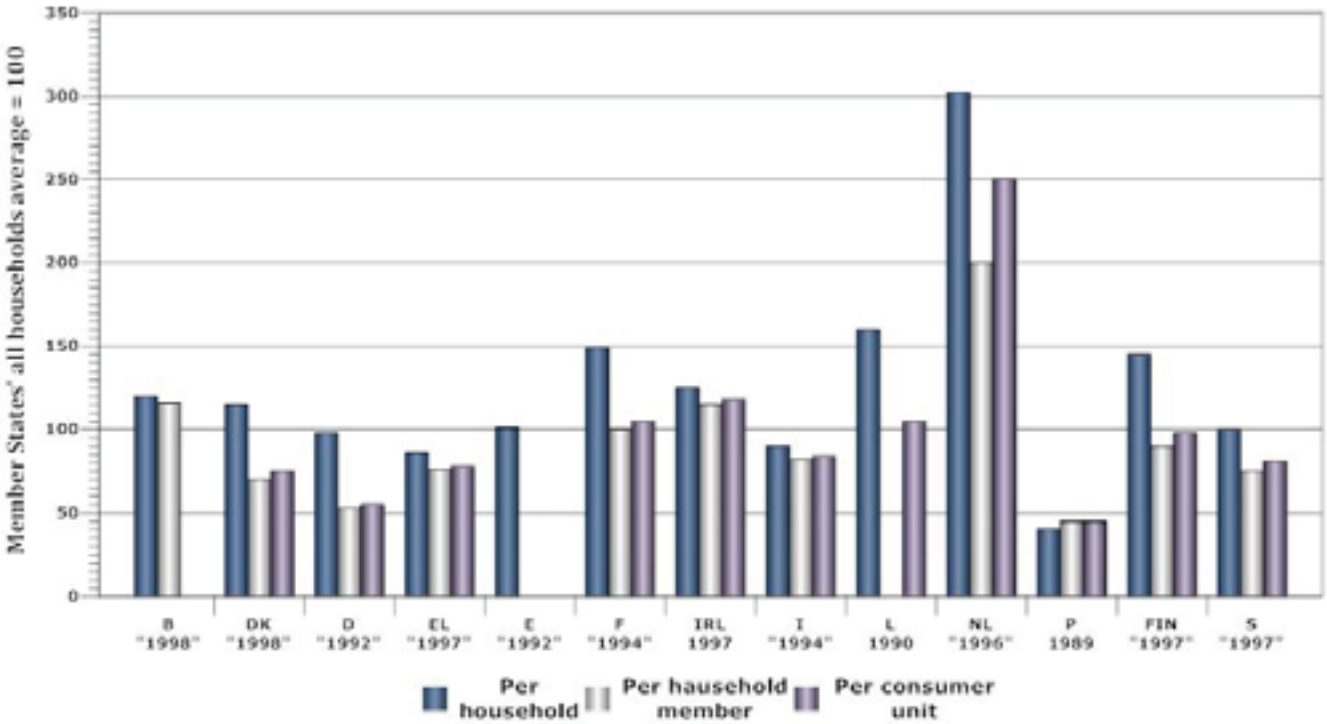
Source: *Income of the agriculture household sector, 2001 Report*. Eurostat

FOCUS FIGURE XIV.34
The development of agricultural household incomes in selected Member States (in real terms and %)



Source: *Income of the agriculture household sector, 2001 report*. Eurostat

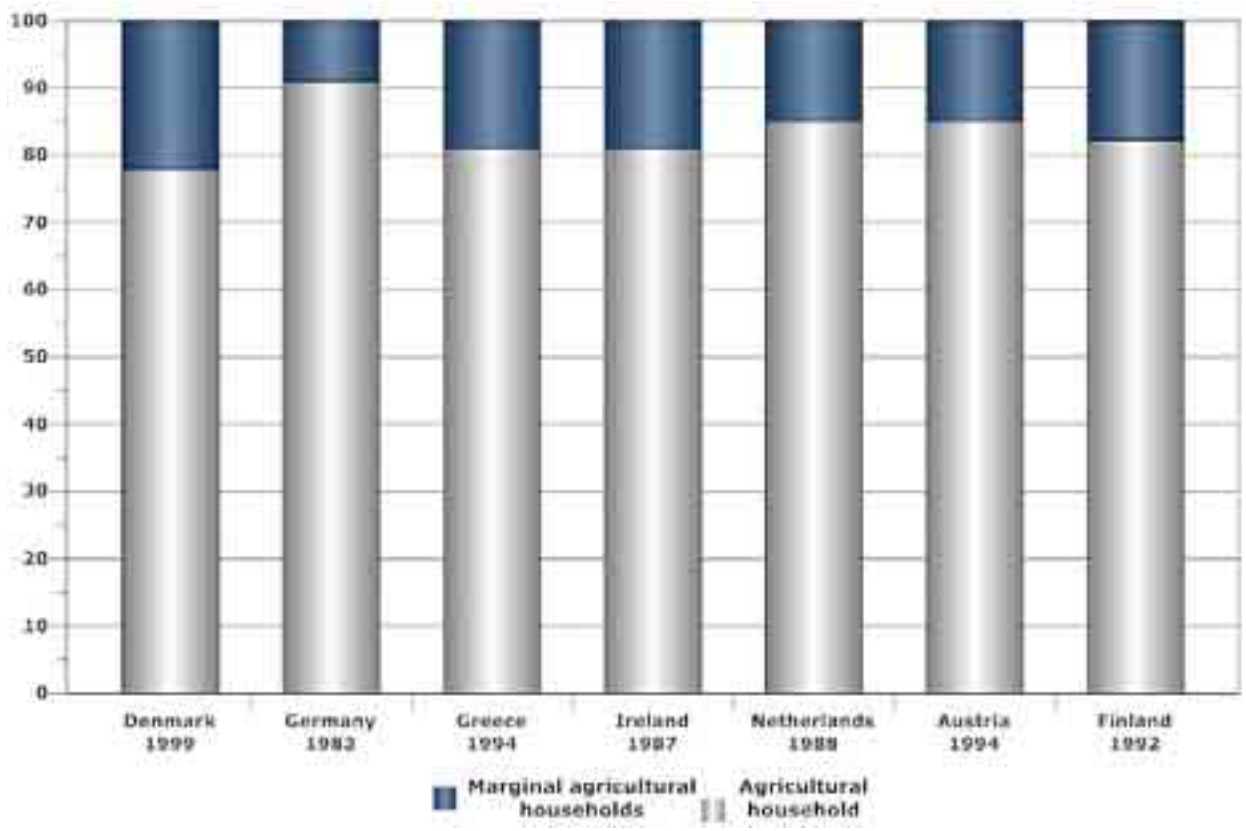
FOCUS FIGURE XIV.35
Average disposable income of agricultural households relative to the all-household average. Selected Members States



Note: For Luxemburg, in the absence of a comparison being generated within the IAHS statistics, interim figures taken from a survey of living standards have been substituted

Source: *Income of the agriculture household sector, 2001 report*. Eurostat

FOCUS FIGURE XIV.36
Income generated from agriculture by agricultural households (narrowly defined) and the "marginal" agricultural households, as a share of the total income generated from agriculture



Source: *Income of the agriculture household sector, 2001 report*. Eurostat

FOCUS TABLE XIV.32
Average disposable income of per agricultural household (narrow definition) and per household member relative to all households (=100)

	Employers and own-account workers			All employees	All others	All except farmers	All households
	Farmers "narrow"	All others	All self-empl.				
	a1	a2	a3	b	c	d=e-a1	e=a+b+c
BELGIUM (1999 p)							
Net disposable income/household	**111.9**					99.9	100.0
Net disposable income/household member	**102.3**					100.0	100.0
DENMARK (1999)							
Net disposable income/household	**104.9**	132.8	128.9	121.5	66.3	100.0	100.0
Net disposable income/household member	**75.8**	104.4	100.1	105.1	88.7	100.2	100.0
GERMANY(1993)							
Net disposable income/household	**78.7**	235.9	214.7	111.1	70.2	100.2	100.0
Net disposable income/household member	**61.7**	250.6	217.7	123.4	89.7	100.8	100.0
GREECE(1998)							
Net disposable income/household	**84.5**	156.2	133.2	90.7	83.1	101.6	100.0
Net disposable income/household member	**73.3**	177.1	152.3	109.3	109.8	103.1	100.0
SPAIN (1990)							
Net disposable income/household	**97.0**	118.6	113.2	124.3	68.8	100.1	100.0
Net disposable income/household member	**84.5**	102.0	97.7	108.8	86.7	100.6	100.0
SPAIN (1990)							
Net adjusted disposable income/household	**103.4**	109.2	107.7	122.2	68.5	99.9	100.0
Net adjusted disposable income/household member	**90.1**	93.8	92.9	107 .1	86.3	100.4	100.0
IRELAND (1987)							
Net disposable income/household	**127.3**					97.4	100.0
Net disposable income/household member	**113.3**					98.6	100.0
ITALY (1995)							
Net disposable income/household	**96.7**					100.1	100.0
Net disposable income/household member	**82.9**					100.4	100.0

	Employers and own-account workers			All employees	All others	All except farmers	All households
	Farmers "narrow"	All others	All self-empl.				
	a1	a2	a3	b	c	d=e-a1	e=a+b+c
NETHERLANDS (1997)							
Net disposable income/household	**328.8**	128.6	151.5	112.8	70.6	98.1	100.0
Net disposable income/household member	**220.6**	103.5	119.2	99.1	95.7	98.5	100.0
PORTUGAL (189)							
Net disposable income/household	**39.6**	147.5	117.3	151.2	28.4	103.0	100.0
Net disposable income/household member	**43.8**	159.7	127.7	171.7	24.0	102.5	100.0
FINLAND (1999)							
Net disposable income/household	**152.4**	163.4	160.4	119.9	63.2	98.9	100.0
Net disposable income/household member	**96.5**	125.1	116.0	103.0	88.0	100.1	100.0
SWEDEN (1997)							
Net disposable income/household	**97.1**	116.1	111.6	125.3	64.3	100.0	100.0
Net disposable income/household member	**76.6**	90.4	87.2	108.0	85.4	100.3	100.0

Source: *Income of the agriculture household sector, 2001 report*. Eurostat

FOCUS TABLE XIV.33
Number of households and levels of average net disposable income for three groups of agricultural households in selected Member States

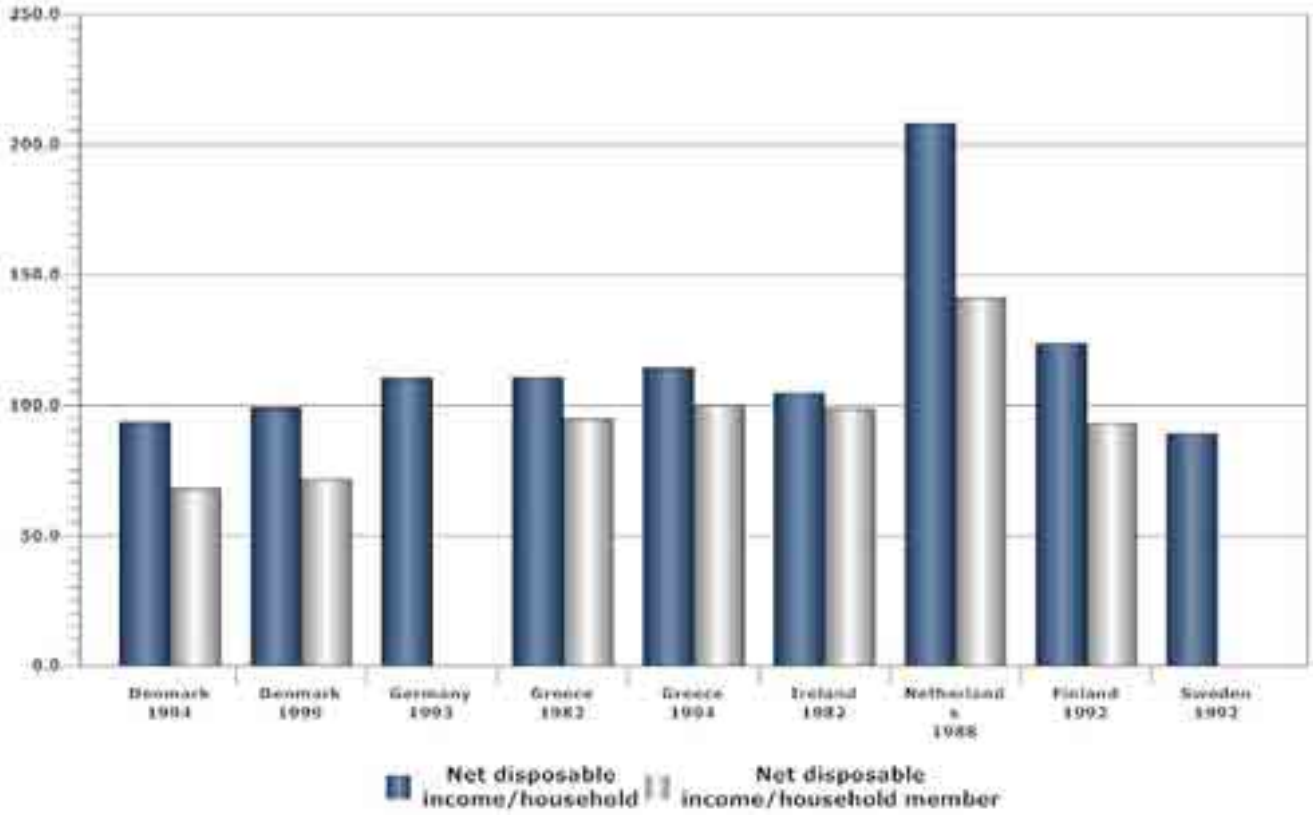
	Denmark (1999)	Germany (1983)	Greece (1994)	Ireland (1987)	Netherlands (1988)	Finland (1992)	Sweden (1992)
				Number of agricultural households (1,000)			
"Broad"	57	613	615	207	136	139	94
"Narrow"	18	353	398	85	87	73	54
"Marginal"	41	260	217	122	49	65	41
				Disposable income per household			
All households	100	100	100	100	100	100	100
Agricultural households							
"Broad"	99	**110**	**114**	**105**	**210**	**124**	81
"Narrow"	**105**	**101**	86	**127**	**287**	**131**	79
"Marginal"	96	**123**	**166**	**89**	**108**	**116**	85
				Disposable income per household member			
All households	100	100	100	100	100	100	100
Agricultural households							
"Broad"	71		**100**	98	**138**	93	
"Narrow"	76		78	**113**	**175**	88	
"Marginal"	70		**147**	87	75	**101**	
				Disposable income per consumer unit			
All households	100	100	100	100	100	100	100
Agricultural households							
"Broad"	77		**101**	**101**	**167**	97	
"Narrow"	83		76	**117**	**211**	94	
"Marginal"	76		**149**	89	**85**	102	

Notes:
A special study was conducted by the CBS, Netherlands, to calculate results according to the broad definition of an agricultural household. The results that were derived have not been updated since 1998 unlike results derived for the narrow definition. Therefore, so that there is consistency in the comparison between broad and narrow results, the narrow results that were available at the same time as the study results for the broad definition have been taken. This means, however, that the narrow results appearing for 1988 are not most up-to-date figures that Eurostat has received.

The definition of the three groups of agricultural households are:
"narrow" – main source of income of the reference person is independent activity in agriculture.
"broad" – where any member of the household has some income from independent activity in agriculture
"marginal" – households which satisfy the "broad" definition but not the "narrow" definition

Source: *Income of the agriculture household sector, 2001 report*. Eurostat

FOCUS FIGURE XIV.37
Average disposable income of per agriculture household (wide definition) and per household member relative to all households (=100)



	DENMARK 1994	DENMARK 1999	GERMANY 1993	GREECE 1982	GREECE 1994	IRELAND 1982	NETHERLANDS 1988	FINLAND 1992	SWEDEN 1992
Net disposable income/household	93.7	98.8	110.3	110.4	114.3	104.9	208.2	123.7	89.1
Net disposable income/household member	69.7	71.4		94.8	99.8	98.4	141.2	93.2	

Source: *Income of the agriculture household sector, 2001 report*. Eurostat

FOCUS PIECES

Eurostat (1995). *Manual on the Total Income of Agricultural Households – Rev 1.* Theme 5 Serues E. Eurostat, Luxembourg.

Eurostat (2002). *Income of the Agricultural Household Sector – 2001 report.* 2002 edition. Theme 5. Eurostat, Luxembourg. (This electronic publication contains, in addition to results, various research reports and an inventory of methodology at Member State level).

Focus on Income and Wealth Statistics for Developing Countries

In recent years, there has been a special effort on the part of countries as well as international agencies such as the World Bank, FAO and the United Nations to encourage and support countries to design and implement household income and expenditure or living standards measurement surveys. In large part, this effort has been driven by the need to monitor changes in income and wealth and related statistics such as poverty levels, both to monitor the impact of national policies and to track progress towards the first Millennium Development Goal – the eradication of extreme poverty and hunger. Under an international arrangement set up by the United Nations, the World Bank has responsibility for compiling data on MDG target 1A – to halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day, based on purchasing power parities. As part of this effort the World Bank has developed a data base of national surveys that meet minimum standards and which can be used to estimate poverty levels. The Bank also uses this data to compile data on MDG target 1A, using data from the International Comparison Program to translate the agreed international poverty line into national currencies using purchasing power parities. Since the 2005 round of the International Comparison Program, the international poverty line has been the equivalent of $1.25 per person per day.

Focus Table XIV.34 shows the availability of data for countries for MDG 1 as estimated by the United Nations Statistics Division. In order to estimate trends in poverty levels and report on progress towards MDG 1, at least two data points are required. The regional breakdown in the table is that used by the United Nations.

FOCUS TABLE XIV.34

The availability of data in countries for the indicators used to monitor progress towards Millennium Development Goal 1

	Number of Countries	Countries with at least 1 data point	Countries with at least 2 data points	Countries with at least 2 data points, excluding modeled data by agency
Population below $1 (PPP) per day, percentage (07 Jul 2011)				
Developed Regions	57	22	21	21
Developing Regions	161	96	73	73
Northern Africa	6	4	3	3
Sub-Saharan Africa	50	42	29	29
Latin America and The Caribbean	46	25	21	21
Eastern Asia	6	2	2	2
Southern Asia	9	8	7	7
South-Eastern Asia	11	8	8	8
Western Asia	13	5	3	3
Oceania	20	2	0	0
Population below national poverty line, total, percentage (07 Jul 2011)				
Developed Regions	57	18	17	17
Developing Regions	161	89	77	77
Northern Africa	6	4	3	3
Sub-Saharan Africa	50	41	34	34
Latin America and The Caribbean	46	20	18	18
Eastern Asia	6	2	2	2
Southern Asia	9	7	7	7
South-Eastern Asia	11	8	8	8
Western Asia	13	5	4	4
Oceania	20	2	1	1
Population below national poverty line, urban, percentage (07 Jul 2011)				
Developed Regions	57	11	10	10
Developing Regions	161	83	63	63
Northern Africa	6	3	2	2
Sub-Saharan Africa	50	39	25	25
Latin America and The Caribbean	46	19	17	17
Eastern Asia	6	2	2	2

	Number of Countries	Countries with at least 1 data point	Countries with at least 2 data points	Countries with at least 2 data points, excluding modeled data by agency
Southern Asia	9	7	7	7
South-Eastern Asia	11	7	7	7
Western Asia	13	4	2	2
Oceania	20	2	1	1
Population below national poverty line, rural, percentage (07 Jul 2011)				
Developed Regions	57	12	11	11
Developing Regions	161	82	68	68
Northern Africa	6	3	2	2
Sub-Saharan Africa	50	39	31	31
Latin America and The Caribbean	46	18	16	16
Eastern Asia	6	2	2	2
Southern Asia	9	7	7	7
South-Eastern Asia	11	7	7	7
Western Asia	13	4	2	2
Oceania	20	2	1	1
Purchasing power parities (PPP) conversion factor, local currency unit to international dollar (07 Jul 2011)				
Developed Regions	57	48	48	48
Developing Regions	161	128	117	117
Northern Africa	6	5	5	5
Sub-Saharan Africa	50	46	40	40
Latin America and The Caribbean	46	32	32	32
Eastern Asia	6	5	5	5
Southern Asia	9	9	9	9
South-Eastern Asia	11	11	11	11
Western Asia	13	12	9	9
Oceania	20	8	6	6

Source: United Nations Statistics Division: URL:
http://mdgs.un.org/unsd/mdg/DataAvailability.aspx

Focus Table XIV.35 shows the latest available estimates for developing countries of poverty rates based on national poverty lines and on the international poverty line used for MDG monitoring. Comparisons between countries are only possible using the international poverty line. The regions in Focus Table XIV.35 are those used by the World Bank and do not correspond to the regions used by the United Nations.

In most countries, where the data refers to the same year, rural poverty rates, estimated using a rural poverty line and higher than those found in urban areas, where an urban poverty line has been applied.

FOCUS TABLE XIV.35

Estimates of poverty rates in developing countries based on national poverty lines and the international poverty line of US$1.25 per person per day calculated in purchasing power parities

	Using national poverty lines						Using the International poverty line of US$1.25	
	Rural		Urban		National			
	Value	Year	Value	Year	Value	Year	Value	Year
East Asia & Pacific								
Cambodia	34.5	2007	11.8	2007	30.1	2007	28.3	2007
Lao PDR	31.7	2008	17.4	2008	27.6	2008	33.9	2008
Papua New Guinea	41.3	1996	16.1	1996	37.5	1996	35.8	1996
Vietnam	18.7	2008	3.3	2008	14.5	2008	13.1	2008
China	2.5	2005	2.0	1998	2.8	2004	15.9	2005
Indonesia	17.4	2009	10.7	2009	14.2	2009	18.7	2009
Micronesia, Fed. Sts.							31.2	2000
Philippines	50.7	1997	21.5	1997	26.5	2009	22.6	2006
Thailand	10.4	2009	3.0	2009	8.1	2009	10.8	2009
Mongolia	46.6	2008	26.9	2008	35.2	2008	22.4	2005
Timor-Leste					49.9	2007	37.4	2007
Fiji	43.3	2009	18.6	2009	31.0	2009		
Malaysia	8.2	2009	1.7	2009	3.8	2009	0.0	2009
Europe & Central Asia								
Kyrgyz Republic	50.8	2005	29.8	2005	43.1	2005	1.9	2007
Tajikistan	49.2	2009	41.8	2009	47.2	2009	21.5	2004
Armenia	25.5	2009	26.9	2009	26.5	2009	1.3	2008
Georgia	29.7	2007	18.3	2007	23.6	2007	14.7	2008
Uzbekistan							46.3	2003
Turkmenistan							24.8	1998
Ukraine	11.3	2005	6.3	2005	7.9	2005	0.1	2005
Kosovo	49.2	2006	37.4	2006	45.0	2006		
Moldova					29.0	2005	1.9	2008
Azerbaijan	18.5	2008	14.8	2008	15.8	2008	1.0	2008
Bosnia and Herzegovina	17.8	2007	8.2	2007	14.0	2007	0.0	2007
Albania	14.6	2008	10.1	2008	12.4	2008	0.6	2008
Belarus					5.4	2009	0.0	2008
Bulgaria					12.8	2001	1.0	2007
Kazakhstan	21.7	2002	10.2	2002	15.4	2002	0.2	2007
Macedonia, FYR	21.3	2006	17.7	2006	19.0	2006	0.3	2008
Montenegro	8.9	2008	2.4	2008	4.9	2008	0.0	2008
Romania	22.3	2006	6.8	2006	13.8	2006	0.5	2008
Russian Federation	21.2	2006	7.4	2006	11.1	2006	0.0	2008

	Using national poverty lines						Using the International poverty line of US$1.25	
	Rural		Urban		National			
	Value	Year	Value	Year	Value	Year	Value	Year
Serbia	9.8	2007	4.3	2007	6.6	2007	0.1	2008
Turkey	38.7	2009	8.9	2009	18.1	2009	2.7	2005
Lithuania							0.0	2008
Latin America & Caribbean								
Haiti	88.0	2001	45.0	2001	77.0	2001	54.9	2001
Bolivia	77.3	2007	50.9	2007	60.1	2007	14.0	2007
Belize	44.2	2002	23.7	2002	33.5	2002	12.1	1999
Ecuador	57.5	2009	25.0	2009	36.0	2009	5.1	2009
El Salvador	46.5	2009	33.3	2009	37.8	2009	5.1	2008
Guatemala	70.5	2006	30.0	2006	51.0	2006	16.9	2002
Paraguay	49.8	2009	24.7	2009	35.1	2009	5.1	2008
Guyana							7.7	1998
Honduras	64.4	2009	52.8	2009	58.8	2009	23.3	2007
Nicaragua	67.9	2005	29.1	2005	46.2	2005	15.8	2005
St. Lucia							20.9	1995
Argentina			13.2	2009			0.9	2009
Brazil					21.4	2009	3.8	2009
Chile	12.9	2009	15.5	2009	15.1	2009	0.8	2009
Colombia	64.3	2009	39.6	2009	45.5	2009	16.0	2006
Costa Rica	23.0	2009	20.7	2009	21.7	2009	0.7	2009
Dominican Republic	57.1	2006	45.3	2006	50.5	2008	4.3	2007
Jamaica	25.1	2002	10.6	2002	9.9	2007	0.2	2004
Mexico	60.8	2008	39.8	2008	47.4	2008	3.4	2008
Panama	59.8	2008	17.7	2008	32.7	2008	9.5	2006
Peru	60.3	2009	21.1	2009	34.8	2009	5.9	2009
Suriname							15.5	1999
Uruguay	22.2	2008	20.3	2008	20.5	2008	0.0	2009
Venezuela, RB					29.0	2009	3.5	2006
Cuba								
Middle East & North Africa								
Egypt, Arab Rep.	30.0	2008	10.6	2008	22.0	2008	2.0	2005
Iraq	39.3	2007	16.1	2007	22.9	2007	4.0	2007
Jordan	19.0	2006	12.0	2006	13.3	2008	0.4	2006
Morocco	14.5	2007	4.8	2007	9.0	2007	2.5	2007
Syrian Arab Republic							1.7	2004
Tunisia					3.8	2005	2.6	2000
Djibouti							18.8	2002
Yemen, Rep.	40.1	2005	20.7	2005	34.8	2005	17.5	2005
West Bank and Gaza					21.9	2009		
Algeria	30.3	1995	14.7	1995	22.6	1995	6.8	1995
Iran, Islamic Rep.							1.5	2005
South Asia								
Afghanistan	37.5	2008	29.0	2008	36.0	2008		
Bangladesh	43.8	2005	28.4	2005	40.0	2005	49.6	2005
Nepal	34.6	2004	9.6	2004	30.9	2004	55.1	2004

	Using national poverty lines						Using the International poverty line of US$1.25	
	Rural		Urban		National			
	Value	Year	Value	Year	Value	Year	Value	Year
India	28.3	2005	25.7	2005	27.5	2005	41.6	2005
Pakistan	27.0	2006	13.1	2006	22.3	2006	22.6	2005
Bhutan	30.9	2007	1.7	2007	23.2	2007	26.2	2003
Maldives							1.5	2004
Sri Lanka	15.7	2007	6.7	2007	15.2	2007	7.0	2007
Sub-Saharan Africa								
Zimbabwe	44.0	1995	32.0	1995	72.0	2003		
Benin	46.0	2003	29.0	2003	39.0	2003	47.3	2003
Burkina Faso	52.4	2003	19.2	2003	46.4	2003	56.5	2003
Burundi	68.9	2006	34.0	2006	66.9	2006	81.3	2006
Central African Republic	69.4	2008	49.6	2008	62.0	2008	62.8	2008
Chad	58.6	2003	24.6	2003	55.0	2003	61.9	2003
Comoros	48.7	2004	34.5	2004	44.8	2004	46.1	2004
Congo, Dem. Rep.	75.7	2005	61.5	2005	71.3	2005	59.2	2006
Eritrea			62.0	1993	69.0	1993		
Ethiopia	39.3	2004	35.1	2004	38.9	2004	39.0	2005
Gambia, The	67.8	2003	39.6	2003	58.0	2003	34.3	2003
Ghana	39.2	2006	10.8	2006	28.5	2006	30.0	2006
Guinea	63.0	2007	30.5	2007	53.0	2007	43.3	2007
Guinea-Bissau	69.1	2002	51.6	2002	64.7	2002	48.8	2002
Kenya	49.1	2005	33.7	2005	45.9	2005	19.7	2005
Liberia	67.7	2007	55.1	2007	63.8	2007	83.7	2007
Madagascar	73.5	2005	52.0	2005	68.7	2005	67.8	2005
Malawi	55.9	2004	25.4	2004	52.4	2004	73.9	2004
Mali	57.6	2006	25.5	2006	47.4	2006	51.4	2006
Mauritania	61.2	2000	25.4	2000	46.3	2000	21.2	2000
Mozambique	56.9	2008	49.6	2008	54.7	2008	60.0	2008
Niger	63.9	2007	36.7	2007	59.5	2007	43.1	2007
Rwanda	64.2	2006	23.2	2006	58.5	2006	76.8	2005
Sierra Leone	78.5	2003	47.0	2003	66.4	2003	53.4	2003
Tanzania	37.4	2007			33.4	2007	67.9	2007
Togo	74.3	2006	36.8	2006	61.7	2006	38.7	2006
Uganda	27.2	2009	9.1	2009	24.5	2009	28.7	2009
Zambia	76.8	2006	26.7	2006	59.3	2006	64.3	2004
Cape Verde	44.3	2007	13.2	2007	26.6	2007	21.0	2002
Swaziland	75.0	2001	49.0	2001	69.2	2001	62.9	2001
Angola			62.3	2000			54.3	2000
Cameroon	55.0	2007	12.2	2007	39.9	2007	9.6	2007
Congo, Rep.	57.7	2005			50.1	2005	54.1	2005
Cote d'Ivoire	54.2	2008	29.4	2008	42.7	2008	23.8	2008
Lesotho	60.5	2003	41.5	2003	56.6	2003	43.4	2003
Nigeria	63.8	2004	43.1	2004	54.7	2004	64.4	2004
Sao Tome and Principe	64.9	2001	45.0	2001	53.8	2001	28.6	2001
Senegal	61.9	2005	35.1	2005	50.8	2005	33.5	2005
Botswana	44.8	2003	19.4	2003	30.6	2003	31.2	1994
Gabon	44.6	2005	29.8	2005	32.7	2005	4.8	2005

	Using national poverty lines						Using the International poverty line of US$1.25	
	Rural		Urban		National			
	Value	Year	Value	Year	Value	Year	Value	Year
Namibia	49.0	2003	17.0	2003	38.0	2003	49.1	1993
Seychelles							0.3	2007
South Africa					23.0	2005	17.4	2006

Source: World Bank. URL: http://go.worldbank.org/BBGMC9CTE0

CHAPTER XV

FINDINGS AND GOOD PRACTICES IN STATISTICS ON RURAL DEVELOPMENT AND AGRICULTURAL HOUSEHOLD INCOME – A CONTRIBUTION TO THE IMPLEMENTATION PLAN OF THE GLOBAL STRATEGY

XV.1 INTRODUCTION

This chapter brings together the central issues in the methodologies of rural statistics and the measurement of agricultural household income and wealth. It points to **good practice** in each of these areas. This is relevant to both OECD and developing countries and is seen as making a particular contribution to the implementation of the *Global Strategy to Improve Agricultural and Rural Statistics* (World Bank *et al.*, 2011) which is the result of cooperation between many national and international organisations (though prepared under the auspices of the UN Statistical Commission). This Global Strategy aims to provide the framework for national and international statistical systems to produce the basic data and information to guide policy decision-making in the 21st century.

As was described at the outset (see Chapter I) the purpose of compiling this Handbook was not to produce a detailed and prescriptive manual on how statistics for rural development and on agricultural household incomes should be produced. Rather, it was to inform both suppliers and users in these relatively new areas of statistics of the issues that have to be confronted, the alternative approaches, potential data sources etc. by drawing on the experiences gained in international organisations and national statistical

offices. Nevertheless, one general lesson to be learned is that a **lack of harmonisation** hinders in a very substantial way the ability to synthesise findings and draw comparisons between countries, information that is valuable in understanding the economic and other changes taking place. Therefore, particularly in the section on agricultural household income measurement, it is possible to suggest certain definitions and approaches that responsible officials might adopt. Of course, in groups of countries like the European Union (EU) harmonisation can be carried a step further within the framework of community institutions.

Statistical indicators are tools that assist in the formulation of policies and the monitoring of changes/development/progress of those policies. Various overlapping sets of desirable characteristics of indicators are encountered in this Handbook. Bringing these together suggests that indicators should be:

- **Problem-oriented and relevant**, which will also include **timeliness;**
- **Reliable** in the sense that they are analytically sound and based on scientific evidence of their links with the problem in hand;
- Capable of establishing **levels, dispersions** and **trends** in the characteristics they attempt to measure;
- Capable of providing a **reference value** which can act as a benchmark against which change can be measured;
- Capable, within the bounds of suitability to different circumstances, of permitting **comparisons in space**, especially between countries. and bearing in mind the increasing interest in international comparisons;
- Capable of **reacting rapidly** to changing situations, including the interventions used to implement policies;
- Easily **understandable**, in the sense that they are **clearly defined** and capable of providing **conclusions easily communicated** to policy makers;
- Where formed by combining or comparing datasets, the elements should be based on the **same statistical units**.

However, the selection of indicators will always be a **compromise** because:

- Data collection is usually an expensive activity, especially where a new or additional survey has to be developed. Indicators are often restricted to exploiting existing datasets and sources or those to which commitments have already been made, adding value to the source. Where suitable data are absent (a characteristic that is not confined to developing countries, though its impact may be most severe there), there is an inevitable focus on the need to establish priorities and for coping strategies to deal with less-than-ideal conditions. Thus reliability is also a desirable characteristic of an indicator;
- The cost/benefit ratio of an indicator is significant in its development, particularly in economically poor countries. The benefits come in many forms, and at times political and administrative factors may outweigh the potential efficiency gains of better policy decisions;
- Priority is often given to indicators that are capable of assisting in the routine monitoring of policies. For example, policies addressing rural development for a

whole country have to describe problems/targets common to all rural areas of that country, that is, generality is a significantly desirable quality in an indicator. Indicators addressing specific problems for particular rural areas are less likely to be developed.

XV.2 STATISTICS FOR RURAL DEVELOPMENT

Statistics should be **policy-determined**, that is, they should be available to assist with the formulation of policies and assessing the performance of interventions. The aims of rural development policies are not always articulated clearly or in a timely way, and statisticians may have to anticipate the demand for indicators (see Chapter II).

Looking at the "typical" problems of rural areas in the past decades, rural development policies normally aim to make rural places **economically, socially, culturally and environmentally healthy**. For developing countries poverty is a major problem in rural areas, and its multi-dimensional nature frequently combines most, if not all, of these aspects of healthiness. In OECD countries, while socio-economic elements remain significant, environmental issues are assuming a growing importance in policies for rural areas. In broad terms, a successful rural development policy may be seen as one that allows rural areas to:

- Be able to at least maintain their population and within it a viable population age and gender structure;
- Diversify their economic base beyond the primary sector, maintaining or even increasing employment rates to absorb the loss of jobs in the primary sector;
- Be able to keep poverty rates and unemployment rates on a level not worse than those in urban areas. They should also aim at offering job opportunities for women and young people;
- Be as easily accessible as possible and provide a minimum set of services. This means they should be well connected with neighbouring areas, which is the basis of tourism/recreation related industries. The provision of easy access to education, health care etc. for the local population is also required to maintain the attractiveness of living in the local area;
- Keep property ownership as wide spread as possible. The rate of locally financed and initiated new small enterprise start-ups should be relatively high;
- Keep the physical and mental health of the rural population as good as it is elsewhere;
- Make their key players work together towards common goals with an agreed value basis. The goals and values are set using a bottom-up approach. The local government should be empowered with reasonable fiscal and decision-making autonomy;
- Be responsible for their own development and not have it done by others;
- Be sustainable in their development policies, in the sense that environmental issues have to be taken together with economic and social ones;

- Maintain and improve the quality of the natural environment, including ir biodiversity and landscapes, taking due notice of responsibilities to future generations;
- Develop the potential that agriculture has to deliver environmental benefits for residents of both rural and non-rural areas;
- Contribute to solutions to global environmental problems, including climate change.

The implementation of the *Global Strategy* has identified a number of methodological issues in rural development to which priority has to be given. These are:

- The collection of gender-disaggregated statistics;
- The clarification of rural definitions and boundaries;
- Measures of well-being beyond income (such as consumption and wealth);
- The identification of core indicators as part of a common implementation plan with the Global Strategy;
- Development of a micro-macro approach to statistical data collection, including methods to reconcile national accounts with survey estimates;
- Development of master sample frames to link household and agricultural surveys.

XV.2.1 KEY ISSUES IN RURAL STATISTICS

The term "rural statistics" is, strictly, a misnomer. What is usually meant is "statistics for rural areas", and an important reason for having them is to be able to contrast the conditions there with what is found in other areas. Thus, key issues for rural statistics are the **definition of rural** used to distinguish between rural and non-rural areas, the type of **geographical unit** to which it is to be applied, and the nature of the **indicators** that are employed to reflect aspects of concern in these areas.

There is more than one "correct" definition of a rural area and what is most appropriate will depend on the policy problem being considered (see Chapter III). National definitions are continuously under debate and are in fact adjusted from time to time, reflecting, for example, changes in socio-economic and administrative structures or in mobility and communications. Similarly the level at which classifications are applied (that is, the size of the territorial units and the level of geographical hierarchy) will depend on the analytical purpose or on the policy problems that have to be solved. Within Member countries, the OECD scheme distinguishes two hierarchical levels of geographic detail: local community level (small, though not necessarily the smallest possible, basic administrative or statistical units) and regional level. This Handbook recognises that a **hierarchical system** (not necessarily just two-level) is good practice (see Chapter VI).

The choice of what constitutes a rural area can have a marked effect on the results shown in statistics, such as the proportions of the population of a country who live there. As the demand for internationally comparable information rises, some kind of

standard both for the definition of rural and for a set of indicators is desirable. In an increasingly globalized world, policy makers, researchers and the general public are not only interested in statistics showing what is going on in their country but also statistics on how their country compares to others such as neighbouring countries or countries with similar environmental, climate, social or political conditions.

Comparisons between countries rely on a commonality in statistical methodology. Certain bases of classification and typologies of rural areas have gained predominance at international level. The OECD system is widely used at regional level. This Handbook recognises the value of countries having the capacity to generate rural statistics on this **standardised OECD basis**, though they should not ignore the advantages flowing from more detailed or complex bases of classification for national purposes.

Whichever level of geographical unit is selected, there are good reasons for covering the **entire territory** (that is, both rural and non-rural areas). Rural analysis relies on the ability to describe the differences and the interrelationships between the rural areas and the other parts of the country. Only if data are available for all parts can consistency of results be confirmed and flexibility of analytical capacity retained (for example, the use of alternative sizes of territorial unit for establishing rural areas). This Handbook recognises the value of classifications that cover all geographical areas and encourages their use as good practice.

In terms of what data should be collected, it is widely accepted in OECD countries that statistics for agriculture only relate to a small (and usually shrinking) sector of the economy and society, though this is not necessarily true for some developing countries. In most circumstances, rural statistics have to cover a broad range of economic, social and environmental issues (see Chapter IV). Various lists of indicators exist for OECD and EU countries and for the developing world (World Bank, FAO) (see Chapter V and Chapter VI). While there is some overlap between indicator sets, there are also differences that reflect the priorities of the institutions that drew them up. To take just one example, Eurostat has proposed that all Member States collect data on the following themes.

- Demography - Migration;
- Economy - Human capital;
- Economic structure and performance (primary sector);
- Accessibility to services - Infrastructure;
- Social well-being.

As part of the **Global Strategy to Improve Agricultural and Rural Statistics** the UN Statistical Commission has endorsed a list of indicators that brings forestry, fisheries and land and water use into the agricultural and rural framework (see Chapter IV). This Handbook recognises the value of a **set of "core" indicators** for international use.

Each theme and related indicators has its own methodological questions that must be addressed, too numerous to be detailed here. Some overlap with material in the second part of the Handbook, such as the definition of a household and the use of equivalence scales when assessing poverty. Nevertheless, there are common sources of weakness

that statisticians should take steps to minimise, such as **the dangers of using data from different sources that are not entirely compatible in order to construct indicators**. A general warning can be made about the use of a particular type of indicator - **composite indices**. Because of the multitude of indicators, it might be tempting to construct a rural composite of indices for international benchmarking. This Handbook strongly warns against such a practise, for statistical reasons set out in Chapter IV, Section IV.3.

It is possible to be more prescriptive about recommending that **methodological details are made available** to users. For practical reasons rural development statistics must often be based on a multitude of statistical sources, sometimes rather disparate in nature. This Handbook strongly endorses, as good practice, the publication, together with the statistics, of a detailed analysis of the **sources and methods** used, adequate **meta data** for the individual data cells, and a **readers' guide**, advising how the results should be interpreted and with what precision.

For **international benchmarking** the above methodological information should be recorded for each country. If incompatibilities exist, these must be clearly indicated, together with a guide to what extent data indicator levels can in fact be compared. If they cannot, only **changes in levels** of indicators should be recorded.

However sophisticated the methodology put forward for rural statistics, a crucial factor in their development is the **availability of data**. The Handbook considers the generic sources (see Chapter VII) and their relative advantages and drawbacks. Sources are more varied in OECD member countries (censuses and surveys of various kinds, administrative records etc.) than in developing countries, where household surveys are predominant. Any new system for data collection is likely to demand substantial resources, and surveys should be set within a proper statistical framework for efficient operation. There will be obvious interest in making use of what already exists by adding value, though the warnings of mixing disparate sources will have to be heeded.

Despite such dangers, when assembling statistics for rural areas it is often useful to gather (secondary) data from more than one source, when available, in order to cope with potential problems of reliability and validity. It is in the discrepancies that lessons can often be learned about the shortcomings of one data source or another and pointers to improvements found.

Some countries are able to link existing datasets in a reliable way, typically using personal identifier labels – Scandinavia leads the way in this respect. As a case study, experience in **Canada** (see Chapter IV) demonstrates good practice in which a flexible dataset can provide a wealth of information relevant for many aspects of rural policy. The statistics show the extent of changes over time in key indicators (on migration, employment, incomes, consumption spending, health, education etc.) and help identify those that are associated with successful development strategies.

XV.2.2 RURAL MEASUREMENT PROBLEMS

Statistics on rural development are problematic in several ways. They are largely based on national censuses and surveys, which, in most industrialized countries at least, were

not designed with rural areas particularly in mind. As a consequence, many statistics used routinely at the national level or in urban regions need to be treated with caution when applied to rural areas. And, statistics that might pertain largely to rural areas, for instance on land use, are often not part of national or regional data sets.

One central problem is that, because they are delineated on the basis of density and/or size of place, **rural areas do not remain constant over time and their boundaries are porous**. Rural areas that gain population become at some point urban areas and are then classified as such. This makes it difficult to track changes over time. Thus, looking at historical population trends using a current delineation of rural-urban is likely to underestimate overall rural population growth and overestimate urban growth. Without a careful presentation of the data, it is easy to conclude that areas have not grown because they are rural, forgetting that areas remain rural because they have not grown.

Rural boundaries not only change over time, but they also become increasingly porous as commuting increases, especially in OECD countries. By definition, rural areas lack large urban centres. Many residents, particularly in areas proximate to cities, may commute outside of the rural area to work. If regions are defined in part on the basis of a commuting threshold, the problem is minimized, but, even here, until that threshold is reached, there will be some discontinuity between jobs in the region and the jobs held by residents. This affects urban as well as rural statistics, but rural statistics are impacted more because commuters typically constitute a larger proportion of the rural work force.

A second issue is that statistics developed at the national level to reflect livelihood and well-being **may be less valid in rural settings than urban settings**. For instance, while censuses and surveys typically ascertain a single occupation, many rural people may hold more than one job. In some rural areas, for instance in many developed countries, a substantial proportion of people with income from farming may not consider farming as their principal occupation. The number of farmers identified in an agricultural census may far exceed the number of farmers found in a population census of the same area.

Another related example is unemployment, a key national and international indicator. This measure works well in urban areas, where the vast majority of people employed are wage and salary workers. In some rural settings, however, particularly agricultural settings, many people are self-employed. In this case, economic hardship is more apt to be marked by underemployment than by unemployment. Farm household members, for example, may have farm work, but also may need to work off the farm and may be able to do so without substantial loss in farm income. The inability of their farms to engage them full-time is not likely to be reflected in unemployment statistics. In developing countries in particular, employment and under-employment may carry gender connotations.

As a final example, rural employment is more likely to be seasonal than urban employment and estimates of labour market conditions can vary considerably depending on when a census or survey is taken.

These examples point to the importance of using household budget and related surveys to supplement census data in understanding rural development conditions.

A third issue, particularly in OECD countries, is a lack of measures that pertain particularly to the development of rural areas, such as **natural amenities**. Measures of urban assets tend to be a by-product of business and other surveys and administrative data. Thus, the presence of transportation hubs, research universities, and substantial high-end business services sectors have all been linked to urban growth in industrialized countries. By these standards, rural regions are clearly disadvantaged. However, rural areas can have their own advantages: pleasant landscapes and climate, lakes or ocean, mountains and streams, and unique picturesque or historical settings. These assets are important for tourism and second home development, but they can also serve to attract entrepreneurs and others who prefer to reside in natural rather than urban environments. A study of rural United States counties found population and employment growth to be more highly correlated with natural amenities than with the economic base (McGranahan, 1999).

The potential importance of these natural assets is included in the concept of farm "multifunctionality," where farms and farmland are recognized as having environmental, recreational, and scenic outputs in addition to agricultural productivity. However, the actual measures of rural amenities - what attracts people to rural areas - have not been developed. One reason is that the measures cannot be derived easily from existing statistical systems. More important is the current lack of any clear basis for ascribing amenity value. When it comes to attractive rural settings, "more" is not always "better." Landscape preference research has found, for instance, that people most like varied landscapes (and even then, only up to a point).

The absence of official measures of these rural amenities does not mean they are irrelevant for rural well-being. Families may be willing to "pay" considerably for these amenities, by accepting lower earnings and/or paying a higher proportion of income for housing. The result may be rural anomalies from a strictly economic perspective, such as population shifts from areas of apparently high real earnings to areas of lower real earnings.

The fourth issue is the relatively **small size of rural regions**. Tabulations of income, occupation, and other socioeconomic measures that are used nationally or in urban regions may be inappropriate for rural areas because of issues of data confidentiality. Statistical Disclosure Limitation (SDL) has become a major concern for statistical agencies as reasonable response rates depend on the belief that respondents have that their answers will be kept in confidence (methods of overcoming this problem were touched on in Chapter VII).

Small size also affects the reliability of statistics estimated on the basis of administrative records. National statistical agencies are increasingly called on to develop local area estimates for various measures where the costs of censuses or major surveys are prohibitive. For instance, in years outside of censuses, area populations may be estimated on the basis of births, deaths, school enrolments, telephone hook-ups, and other measures. Regional income or domestic product may be estimated from establishment data on employment and wages and other information. Typically, estimates are made first at the national and perhaps regional levels, where there are extensive data, and then allocated downward, based on local statistics. In rural areas,

these estimates must be treated cautiously. Estimates are inherently more unreliable where territorial units are small. Moreover, the assumptions and methods that are used in making these estimates may fit urban areas better than rural areas. It is, for instance, typically much more difficult to estimate self-employment income than wage and salary income.

The small size of rural regions can also affect the reliability of estimates from surveys and, since they frequently ask complete sets of questions only for a proportion of respondents, population and other censuses. One way to overcome this problem is by over-sampling in rural regions or at least those rural regions of particular interest, such as agricultural regions or declining regions. Of course, over-sampling in one type of area means under-sampling in another. More precise regional estimates come at the expense of precision in estimates for other national subpopulations such as ethnic groups. Bayesian techniques are available to estimate the sample size necessary to obtain estimates of a given precision.

The fifth issue relates to the **interpretation of rural statistics**. To the extent possible, well-being outcomes (earnings, employment, health etc.) need to be standardized for the composition of the population. This is most obvious in the case of mortality rates, which are highly related to age and sex, but it extends to other areas as well. Comparisons between rural and urban regions or localities almost inevitably find rural areas have lower incomes than urban areas. This does not necessarily mean that rural areas are somehow lagging, however, or that an explicitly regional policy is called for. As noted elsewhere, according to conventional methodology the cost of living is typically lower in rural areas than in urban. But, adjusting for cost of living may not be enough.

The residents of rural regions also tend to have relatively low levels of educational attainment and to be older than their urban counterparts. Since lower levels of educational attainment are generally associated with lower incomes at the individual level, lower rural incomes may reflect the educational characteristics of the rural population rather than any drawback to rural residence. By the same token, if income disparities increase or decrease nationally across educational attainment levels, this will be reflected in increasing or decreasing disparities between rural and urban areas. This tendency of divergence is also found between industrially advanced countries with a highly educated labour force and less developed countries characterised by a predominantly rural economy[1].

XV.3 Statistics on the incomes, wealth and well-being of agricultural households

In OECD countries the relevance of indicators of income and wealth for agricultural households comes in large part from the **aims of agricultural policy** (see Chapter VIII).

[1]According to the ILO, unemployment is quite evenly distributed between men and women with a secondary education in most economies, but at the tertiary level of education greater country-level diversity is apparent. In all the economies shown, females with higher education levels are more often unemployed than males of the same education group. On the other hand, with the exception of Peru, men with low education levels have higher unemployment rates than females in all economies (ILO, KILM 11). Source: http://www.ilo.org./public/english/employment/strat/kilm/kilm11.htm

Though they only represent one component of the population of rural areas, and in many countries a small and declining one, farm households and their livelihoods are the focus of substantial government interest. Concern is not usually well-focussed, but is often to do with the level of income and how this affects consumption possibilities and poverty. In developing countries the prime concern is poverty and a main policy goal is its alleviation.

In addition, within the public sector, policies on deprivation in its various forms, economic development, sustainability, trade liberalisation and environmental quality would find such statistics useful if their aims are to be properly serviced and the performance of policy interventions to be assessed. Other groups also needing the information include academics and commercial firms, such as those in the industries upstream and downstream from farming.

The main way in which incomes in agriculture in OECD countries are currently described by official statistics in most countries (and in the EU as a whole) is by measures of the return to the **factors used in the activity of agricultural production**, as shown in national accounts, special satellite accounts for this industry (such as the EU's Economic Accounts for Agriculture) or surveys of individual farm accounts. While this approach is appropriate for some circumstances, it is clearly not capable of providing information on the non-agricultural sources of income in which farm operators and their households frequently engage. For this a **household perspective** is needed. The combination of farming with other income-generating activities is a common phenomenon in both OECD and developing countries. Non-agricultural incomes from gainful activities together with the returns from property ownership and (where they occur) transfers from governments are necessary inputs to explaining the consumption and savings opportunities of farm households and to their on-farm decisions, such as the choice of enterprise mix, intensity of land use, investment level etc.

To continue to monitor the income situation of farm operators using only indicators based on agricultural activity carries the danger that such **figures will be misused** to draw implications for agricultural households. This would break a fundamental principle in the choice, design and use of indicators which lays emphasis the selection of those that match the problem in hand. What would be needed in OECD countries are indicators of household total and/or disposable income. The same principle might indicate that consumption is preferable to income as a measure of well-being in developing economies.

At present there is **no internationally-agreed system for generating statistics on income and wealth for agricultural households.** EU Member States formerly applied harmonised definitions devised by Eurostat in association with national statistical offices for its Income of the Agricultural Households Sector (IAHS) statistics (see Chapter XIV). These were suspended in 2002, leaving no institution performing a coordinating role, though some Member States continue to apply the definitions for national purposes[2]. The statistical information that exists in OECD countries is patchy,

[2]This role was not taken up by the OECD, though it had previously performed a similar function in relation to aggregage Economic Accounts for Agriculture (EAA). In the 1990s the OECD had for a time coordinated national sets of EAAs for its members, using the methodology applied by Eurostat to EU

contains large gaps and uses different methodologies, a factor that hampers comparisons between countries. Typically the surveys on which most evidence is based relates to a non-constant sample that is shrinking over time, with the snapshots at single points in time hiding a considerable amount of contrary short-term movements ("churning"). Nevertheless, some broad generalisations are possible from existing results among OECD countries (see Chapter XIV) that support the need for better information on the incomes of households that operate farms as entrepreneurs. It is clear that multiple income sources is a characteristic of farming households in OECD countries, a feature common also in developing countries. The finding that, in many OECD countries, farm households as a group are in a relatively favourable position in terms of their income and/or wealth compared with the rest of society carries implications for policies (including the EU's CAP) aimed at ensuring a fair standard of living for the agricultural community.

XV.3.1 METHODOLOGICAL ISSUES IN MEASURING AGRICULTURAL HOUSEHOLD INCOME AND WEALTH

The second section of this Handbook is largely concerned with discussion of methodological issues that have to be confronted when developing income statistics for agricultural households and in reviewing what countries actually do when attempting measurement. The choices made reflect the purposes for which the statistics are required; within a single country there may be a range of uses that, in an ideal world, would be met by using different concepts. For the sake of **international comparability** the same methodology needs to be applied across a range of countries, but these risks imposing definitions on circumstances for which they are not entirely appropriate. Methodology also has to take into account the practicality of being put into operation, which will be usually determined by **available data** sources. In reality the methodology usually turns out to be a compromise. This is why it is valuable to understand the background against which decisions on methodology took place and the process by which choices have been made.

The main methodological issues concern the following:

- Definition of a household (dwelling and single budget units);
- Method of measuring household size and use of equivalence scales;
- The method for classifying households into agricultural and a range of other socio-professional groups;
- The measure of income to be used;
- The measurement of wealth and economic status;
- The distribution of incomes, implications for the use of medians and averages, indicators of inequality, and the measurement of poverty.

Member States, and published the results. However this ceased when the OECD withdrew from work in agricultural statistics.

These are dealt with below. Though this Handbook stops short of making recommendations, it does indicate good practice in approaching each of these issues. It recognises the following:

DEFINITIONS OF HOUSEHOLD, AGRICULTURAL HOUSEHOLD AND RELATED MATTERS

(see Chapter IX, Chapter X, Chapter XI and Chapter XII)

- A flexible but transparent approach should be taken to the definition of a household. While income measurement on the basis of the complete **dwelling household** should be undertaken to facilitate comparisons, both internationally and with national data sources, data should also be available to allow the application of the concept of the **single budget household** which in some circumstances may be preferable (see Chapter IX). However, the concept of a household applicable in OECD members may require modification for use in developing countries.
- In addition to income per household (the average, and where practical, the median), the calculation of **income per household member and per Consumer Unit** (using national equivalence scales) should be undertaken. Details of Equivalence Scales should be made available as meta-data. The basis of these scales may vary between countries at different stages of economic development.
- Data should be available to develop estimates of income for households defined as agriculture in a number of ways, as no one definition will suit all purposes. This flexible approach should permit a coverage of all households that earn **any income from self-employed farming activity**. However, for many of these farming will be only a very minor activity. Particular policy interest focuses on a more **narrowly defined** sub-group, where **agriculture is the main income** of the household (smoothed to take into account the year-to-year variation anticipated by farmers, for which averaging over three years is advised). This "narrow" approach facilitates comparisons with other socio-professional groups selected in a consistent manner. Where it is not possible to classify using the household's main income source, the Handbook recognizes the use of a **reference person** system, where the person is normally the main income earner and households are classified as agricultural or as belonging to some other socio-professional group according to that person's main income (or occupation). For other purposes, selecting from the "broad" coverage by farm size (and other criteria) may be undertaken. Studies should be made to assess the significance of adopting alternative bases of classification and different coverages.
- Steps should be taken to avoid misrepresentations when drawing comparisons between the income situation of agricultural households and other socio-professional groups. At the very least, this should include income comparisons **per household member and per Consumer Unit**. Comparisons of medians and patterns of distributions may be superior to the use of averages.
- The income of households that operate **family farms as corporations** requires special attention, as income comes not as self-employment income but from employment and from property. They may be treated as quasi unincorporated. Results should be shown separately for the households, which would enable

exclusion or inclusion with other agricultural households according the user needs

- The income situation of the households of **hired agricultural workers** (that is, those that do not have entrepreneurial responsibility) should be assessed as a separate and supplementary exercise. An ability to analyse by the type of business on which they are employed should be incorporated (family farm, corporate farm etc.). In developing countries this category will include landless workers in agriculture.
- As a special case of the above, in countries that operate (or previously operated) socialised forms of production, the income situation of the households of **hired workers on all large-scale agricultural units** (whether arranged as cooperatives, other forms in which there is some entrepreneurial responsibility, or corporations) should be assessed as a separate and supplementary exercise, including a breakdown of the type of unit on which they are found and the forms of income they receive (wages, profit share etc.). These households may also be **subsistence producers**. How they should be treated is a matter for further discussion.
- There is value using **flexible typologies of agricultural households** that reflect the needs of users, and their development is encouraged. Consideration should be given to the international application of a classification similar to that used by the USDA-ERS.

Definitions of income and related matters

- Bearing in mind the methodologies of national accounts and the recommendations of the Canberra Group of Experts relating to general household income statistics (see Chapter X), the Handbook recognises the value of applying a **simplified definition of Disposable Income** when measuring the income of agricultural households, as shown in Table XV.1. When presenting results, information should be available for the **separate items** shown in this definition.
- In developing countries the measurement of **consumption** may be superior to that of income in the assessment of living standards and poverty.
- In view of the widely-recognised instability of income from agricultural production, conclusions about agricultural household incomes should not depend on the evidence of a single year. Some system of **averaging incomes over a short run of years** is desirable; there is empirical support for chosing three year averages.
- Basic statistical characteristics of the **distribution of incomes** of agricultural households should be calculated, including medians and quartiles, and measures of inequality and of poverty based on them (see Chapter XI). The use of Lorenz curves, low income rates etc. is encouraged, with comparisons drawn over time, geographically and between agricultural households (variously defined) and other socio-professional group, suitable attention being given to hazards in these comparisons. When setting **income poverty lines** no particular methodology is preferred, though metadata on the methods used should accompany results.
- Household **net worth** is the summation of farm net worth (assets minus debts) and non-farm net worth (assets minus debts) (see Chapter XII). Farm households

may have multiple sources of farm and non-farm assets and/or liabilities. To help ensure accuracy and completeness of estimates, net worth measures should take into account both farm and non-farm sources of wealth. Estimates of net worth should also recognize that farm wealth may not be entirely owned by farm households.

- Indicators that combine income and wealth in a single indicator should be explored (such as estimates of **Economic Status**). Comparisons between agricultural households and other socio-professional groups must be done with care over the issue of assets used in production.

TABLE XV.1
Recommended definition of net disposable income for application to agricultural households

NET INCOME FROM SELF-EMPLOYMENT (MONEY INCOME AND IN KIND)

Net income from self-employment (operation of unincorporated businesses, or incorporated businesses that can be treated as *quasi* unincorporated because of family operation and ownership) after deduction of intermediate consumption items, interest on business loans, rents on land and business property, and a depreciation allowance for capital consumption. This will include net profit or loss in money form and the value of other income in kind, such as the value of output used for barter and for own-consumption, net of cost of inputs used in their production.
Of which:

(a) self-employment in agriculture (money income and in kind)
(b) self-employment in other industries (money income and in kind)
(c) imputed rental value of owned dwelling

+ Cash wages and salaries, earned from dependent activity in enterprises (institutional units) that may be agricultural or non-agricultural in nature

(=Primary income)

+ Rent received
(a) net rents from the letting of property other than land
(b) net rents from the letting of land

+ Other property income
(a) net interest received (interest received less interest paid, though payments should not include interest already deducted in calculating profits)
(b) dividends received

+ Social transfers received
(a) Social insurance benefits from employers' schemes
(b) Social insurance benefits in cash from government schemes
(c) Universal social assistance benefits in cash from government
(d) Means-tested social assistance benefits in cash from government

+ Other current inflows
Regular inter-household cash transfers received such as transfers from relatives living and working abroad)

= TOTAL INCOME

- **Current taxes on income and wealth**

- **Non-discretionary social contributions (payments to social security schemes)**
(a) by members of agricultural households as self-employed person
(b) employee social contributions (only) relating to income from employment

= NET DISPOSABLE INCOME (note: this is not adjusted for the receipt of social benefits in kind)

The review of **current methodological practice** in measuring the income of agricultural households in OECD countries (see Chapter XIII) shows a range of definitions in use and mixed treatment of elements in income (such as imputed flows) and the use of equivalence scales. Of particular significance are the differing approaches used to the coverage of agricultural households in the statistics on the incomes of farm/agricultural households. These fall into two main groups.

First there are countries that take a **"broad" approach** and include among agricultural households all those that operate a farm (usually defined in terms of an agricultural producing unit whose size is above some threshold that separates it from a domestic garden or hobby production). Examples are found mainly where agricultural household statistics are based on censuses or surveys of farms (or agricultural holdings). The US with its ARMS survey is of this type.

Second are those countries that apply a more selective approach designed to include only those households that have agriculture as their main source of income or activity. This **"narrow" approach,** which is common in the EU, is consistent with an assumption that support by agricultural policy is primarily directed at households for whom farming is the main source of income source. Furthermore this approach facilitates comparisons to be made with other socio-professional groups, which may be important when judging whether the incomes provide standards of living that are "fair".

Only rarely are results presented using alternative definitions in the same country (Finland and Ireland provide examples – see Chapter XIV). When this happens within a single dataset, it is clear that the choice of definition often has a major influence not only on the number of households classed as agricultural but also on the results in terms of income level, composition and comparison with other socio-professional groups. This finding points to a need for caution when using unharmonised results and the desirability of agreeing on key elements of methodology for international studies.

XV.3.2 PROVISION OF DATA – THE DATA SYSTEM FOR AGRICULTURAL HOUSEHOLD INCOME MEASUREMENT

The provision of data is, in practice, the **most fundamental problem** facing the development of statistics on the income and wealth of agricultural households. As in the case of rural statistics, without data the discussion of methodological issues and identification of good practice loses much of its relevance.

Reviews of data sources in OECD countries (see Chapter XIII and national case studies in Chapter XIV) show that the three main generic sources of agricultural household income are **farm accounts surveys,** general **household budget** and **household panel surveys** (which increasingly also cover incomes), and **taxation records**. Each has well-known advantages and disadvantages (see Chapter XIII). In developing countries household surveys (Living Standards Measurement Study (**LSMS**) surveys) are the principal method of data collection.

Though there is some information on agricultural household incomes in all OECD countries, **wide variations are found in the availability and quality of data** (see Chapter XIV). A few countries have several good data sources on which to base statistics,

sometimes having the ability to link datasets to provide a powerful and flexible tool of analysis. Examples are the Scandinavian countries with their income registers. Elsewhere a single survey may provide a sufficiently robust base (for example, the ARMS survey of farms in the US). However, **many countries do not have a single satisfactory microeconomic data source**, a group that contains several EU Member States. Situations occur in which simultaneously the national farm accounts survey does not include questions on other sources of income that are necessary to establish household income, where the taxation of farmers does not yield information on actual incomes, and where the household budget and panel surveys either generate too few agricultural household cases for the results to be reliable or where the quality of income data is unacceptably poor. While attempts have been made to minimise this problem by basing sector-level estimates within the framework of national accounts, ultimately these proved to be unsuccessful (Eurostat, 2002). In the more recent discussions on the need for statistics on agricultural household incomes emphasis has once more switched to microeconomic data as a primary source, as it is acknowledged that in many respects only microeconomic data can provide answers to many of the important policy questions.

Developing the data systems of OECD countries so that they are capable of servicing statistics on agricultural household incomes are **matters for national governments and their statistical authorities**. Making use of existing regular farm surveys for which there a continuing commitment by extending coverage to household income and wealth has obvious attractions. Adding value to tax data by modifying the ways that they are processed and accessed in order to provide economic information may be relatively low-cost. Boosting sample sizes of agricultural cases in general household surveys and improving quality of income data, perhaps by establishing links with farm accounts surveys, may be another possibility. Sometimes only a completely new survey is adequate. Each of these advances implies costs, not only in terms of resources used by the data system but politically and in the potential impact on the rest of the statistical system (such as by affecting response rates among cooperators in existing voluntary surveys). Countries will need to appraise their particular opportunities and costs and the routes chosen by which to provide data will probably differ.

By establishing the main elements in the methodology of statistics on agricultural household incomes, it is hoped that this Handbook will assist in identifying **the direction in which data systems should be moving**, if not the exact path by which they should get there.

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