



Government of the Republic of Zambia

Ministry of Tourism, Environment and Natural Resources

# **ZAMBIA NATIONAL ACTION PROGRAMME**

## **FOR COMBATING**

### **DESERTIFICATION & MITIGATING SERIOUS EFFECTS OF DROUGHT IN THE CONTEXT OF THE**

### **UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION**



*(NAP Document as of 28 February 2002)*

## **FOREWORD**

Desertification is a world phenomenon, which describes the gradual loss of productivity in soils and vegetation in drylands and sub-humid areas due to processes such as soil erosion and declining soil fertility exacerbated by both human activities and climatic variations.

Zambia, like most developing countries has been experiencing severe drought for the past years. This has greatly affected the country's capacity for food production and ultimately has affected its food security. Therefore, the drought accompanied with soil erosion and declining soil fertility has undermined the people's living conditions, especially those that are solely dependent on agricultural production.

It is with this background that Zambia welcomed and signed the Convention to Combat Desertification in those countries experiencing serious drought and/or desertification, particularly in Africa (CCD). Zambia signed the Convention on 15<sup>th</sup> October 1994 and ratified it on 19<sup>th</sup> September 1996.

As a party to the Convention, Zambia was requested to prepare a National Action Programme that provides a framework to incorporate long-term strategies to combat desertification and mitigate the effects of drought with national policies for sustainable development. This is in line with the UNCCD objectives under Articles 2, 9 and 10 where the formulation and implementation of National Action Programmes forms the core to the implementation of the Treaty.

The preparation of this document was made possible through funding made available by United Nations Support Office (UNSO) through the United Nations Development Programme (UNDP) to whom we are greatly indebted.

On behalf of the Government of the Republic of Zambia and indeed on my own behalf, I would like to express sincere gratitude to the consultant and all the participants who were involved in various workshops and those who worked tirelessly to make this Report possible.

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## LIST OF ACRONYMS

ACP	-	Agricultural Commercialisation Programme
ADMAGE	-	Administrative Management Design
ASIP	-	Agricultural Sector Investment Programme
CBD	-	Convention on Biological Diversity
CBNRM	-	Community Based Natural Resources Management Programme
CBO	-	Community Based Organisation
CCD	-	Convention to Combat Desertification
CHAPOSA	-	Charcoal Potential in Southern Africa
CEMP	-	Community Environmental Management Programme
CRBS	-	Community Resource Boards
CSS	-	Country Support Strategies
CSO	-	Central Statistical Office
COP	-	Conference of Parties
DANNIDA	-	Danish Development Agency
DCF	-	Donor Community Facilitator
DHS	-	Demographic Health Survey
DDCC	-	District Development Co-ordination Committee
DMMU	-	Disaster Management and Mitigation Unit
DOM	-	Department of Meteorology
EEPA	-	Environmental Education and Public Awareness Programme
ECA	-	Economic Commission for Africa
ECZ	-	Environmental Council of Zambia
EIA	-	Environmental Impact Assessment
EPPCA	-	Environmental Protection and Pollution Control Act
ESP	-	Environment Support Programme
EU	-	European Union
FAO	-	Food and Agricultural Organisation
FINNIDA	-	Finnish Development Agency
FRA	-	Food Reserve Agency
GDP	-	Gross Domestic Product
GM	-	Global Mechanism
GMAS	-	Game Management Areas
GRZ	-	The Government of the Republic of Zambia
GTZ	-	German Technical Aid to Zambia
HIV/AIDs	-	Human Immuno Deficiency Virus/Acquired Immune Deficiency Syndrome
ICBD	-	Integrated Conservation of Dry Land Biodiversity Project
IFAD	-	International Fund for Agricultural Development
ILO	-	International Labour Organisation
IMF	-	International Monetary Fund
ITCZ	-	Inter-Tropical Convergence Zone
IUCN	-	International Conservation Union
JFMS	-	Joint Forestry Management Systems
JICA	-	Japan International Co-operation Agency

LADP	-	Local Area Development Programme
LFA	-	Logical Framework Approach
LIRDP	-	Luangwa Integrated Resource Development Project
LM&CF	-	Land Management and Conservation Farming Project
MACO	-	Ministry of Agriculture and Co-operatives
MAFF	-	Ministry of Agriculture, Food and Fisheries
MCDSS	-	Ministry of Community Development and Social Services
MCT	-	Ministry of Communications and Transport
MENR	-	Ministry of Environment and Natural Resources
MEWD	-	Ministry of Energy and Water Development
MIB	-	Ministry of Information and Broadcasting
MLGH	-	Ministry of Local Government and Housing
MoL	-	Ministry of Lands
MoFED	-	Ministry of Finance and Economic Development
MoFNP	-	Ministry of Finance and National Planning
MPP	-	Micro-projects programme
MTENR	-	Ministry of Tourism, Environment and Natural Resources
NCCD	-	National Co-ordination Committee on Desertification and Drought
NAP	-	National Action Programme
NBSAP	-	National Biodiversity Strategy and Action Programme
NCS	-	National Conservation Strategy
NCDP	-	National Commission for Development Planning
NDF	-	National Desertification Fund
NEAP	-	National Environmental Action Programme
NERP	-	New Economic Recovery Programme
NEWS	-	National Early Warning
NFP	-	National Focal Point System
NGO	-	Non –Government Organisation
NIP	-	National Indicative Programme
NISIR	-	National Institute for Scientific and Industrial Research
NMDC	-	National Ministerial Desertification Committee
NORAD	-	Norwegian Ministry for Development Co-operation
NSC	-	National Steering Committee
PACD	-	United Nations Conference on Desertification
PAM	-	Prevention against Malnutrition
PDCC	-	Provincial Development Co-ordination Committee
PEF	-	Pilot Environmental Fund
PFAP	-	Provincial Forestry Action Programme
PMU	-	Programme Management Unit
PRSP	-	Poverty Reduction Strategy Paper
SADC	-	Southern Africa Development Community
SAP	-	Structural Adjustment Programme
SCAFE	-	Soil Conservation and Agroforestry Project
SIDA	-	Swedish International Development Agency
SLAMU	-	South Luangwa Area Management Unit
SRP	-	Social Recovery Project

SSN	-	Social Safety Net
SSRP	-	Social Sector Rehabilitation Programme
UNCED	-	United Nations Convention on Environment and Development
UNCCD	-	United Nation Convention to Combat Desertification and
UNDP	-	United Nations Development Programme
UNEP	-	United Nations Environment Programme
UNESCO	-	United Nations Educational and Scientific Organisation
UNFCCC	-	United Nations Framework Convention on Climate Change
UNSO	-	United Nations Support Office
UNZA	-	University of Zambia
VAGS	-	Village Action Groups
VAM	-	Vulnerability Assessments and Management
WCRF	-	Wildlife Conservation Revolving Fund
WCS	-	World Conservation Strategy
WMO	-	World Meteorological Organisation
WFP	-	World Food Programme
YWCA	-	Young Women Christian Association
ZAMSIF	-	Zambia Social Investment Fund
ZARD	-	Zambia Association for Research and Development
ZAW	-	Zambia Alliance for Women
ZAWA	-	Zambia Wildlife Authority
ZFAP	-	Zambia Forestry Action Programme
ZNBSAP	-	Zambia National Biodiversity Strategy and Action Plan



## **Executive Summary**

### **1.1 The United Nations Convention to Combat Desertification**

One of the main and long standing environmental problems that has been recognised by the international community to affect social economic development the world over, is the intertwined issue of desertification and drought. Desertification has profound impacts, manifested in the general decline in land productivity, leading to a reduction of the land's biological potential and economic ability to sustain life. This has led to widespread poverty and human misery. This problem is compounded by the effects of climatic variations, in particular the occurrence of severe droughts. The problem is more serious in African developing countries due to lack of financial resources, technological know-how and capacity to combat the problem. Zambia has not been spared from the scourge of land degradation especially during the past ten (10) years.

The UNCCD was initiated in 1994 and it came into force in 1996 after the 1992 Rio Earth Summit. Zambia signed and ratified the Convention in 1994 and 1996 respectively.

The UNCCD aims at combating desertification and mitigating the effects of drought by promoting effective action through innovative local programmes and supportive international partnerships. This is done through developing and carrying out national action programmes. These action programmes must adopt a democratic, bottom-up approach and should emphasise popular participation and create of an 'enabling environment' designed to allow local participation to help them to prevent and reverse desertification.

#### **The National Action Programme and the Process**

As a pre-requisite to the whole process, a Country Party in preparing the country National Action Programme (NAP) should document root causes and extent of the desertification problem, elaborate programmes and projects, the inputs, and actions required for the way forward.

The Zambian Government with the financial assistance from UNDP-UNSO and complying with the requirements of the Convention began to undertake the development of the NAP in 1996 with the creation of a National Steering Committee to spearhead the process. The bottom-up and consensus-building approach was adopted. To this effect, consultative meetings and workshops were carried out in the five provinces of Region I and II that are severely affected by desertification and drought, namely Central, Eastern, Lusaka, Southern and Western. The process involved undertaking of stakeholder inventories and technical studies to document the extent of the problem. These efforts culminated into the National Forum where elements of the NAP for Zambia were discussed and agreed upon. The synthesis of the NAP process in Zambia has resulted in the preparation of the NAP framework document.

The Zambian NAP will concentrate on five provinces of Regions I and II that experience severe problems of land degradation and drought. However, as a preventive measure, programmes aimed at preventing the land degradation problem from spreading should be proposed in areas not yet severely affected by land degradation and drought.

## **1.2 Zambia**

### **1.2.1 Country Setting**

#### **Location and Physical Environment**

Zambia is a land locked country, located near the sub-tropics south of the Equator, and is surrounded by eight neighbouring countries, namely, Angola, Botswana, Democratic Republic of Congo, Malawi, Mozambique, Namibia, Tanzania and Zimbabwe.

The country has a relatively large land surface, with a total area of 752,972 km<sup>2</sup> and lies on the Central Africa high Plateau with an average altitude of 1 200m above sea level. The Rift valley formations in the eastern and southern parts of the country have produced escarpment systems and valley troughs. The most famous of the Escarpment systems is the Muchinga Escarpment.

Zambia's physical environment owes its attributes to her sub-tropical setting, whose features are characteristic of both tropical and semi-arid conditions. The country is divided into three agro-ecological zones of Regions I, II and III. Region I presents semi-arid conditions and Region III experiences tropical conditions while Region II has moderation of the two.

Most of the soils of Zambia particularly those in the northern parts of the country are highly weathered, leached and acidic. This is because of high rainfall in those parts of the country. In the western part of Zambia, the soils are very strongly to strongly acid, coarse to fine sandy soils with more than 90% quartz developed over Kalahari sands. The eastern and south central plateau has moderately leached clayey to loamy soils with medium to strong acidity. These areas are considered to be the best agricultural soils in the Country.

Climate is influenced by three main factors: the Inter-Tropical Convergence Zone which influences the rainfall pattern, occurrence of El Nino which is associated mostly with dry spells and Altitude, which in the case of Zambia lies on a relatively high elevation and bestows the country with moderately cool temperatures resulting into a sub-tropical climate which would probably have been harsh. The country experiences three climatic distinct seasons namely; the warm rainy (November – April), the cool dry (May – July) and the hot dry (August – October).

Zambia is well endowed with water resources, both ground and surface water. The major perennial rivers are the Zambezi, Kafue, Luangwa, Kabompo, Luapula, and Chambeshi. Other sources of surface water include lakes, swamps and flood areas. The rainfall

Zambia receives replenishes these water bodies. Surface water constitutes 20% of the Country's area.

### **1.2.2 Biological Resources**

Zambia has a variety of ecosystems, which give rise to a rich biodiversity in terms of wildlife, plant, bird and fish species. The Country's vegetation is classified into four major categories, namely, closed forests, open forests, termitaria and grasslands. Zambian forests cover 60% of the Country. Zambia has a flora diversity of over 3,000 species with 40% comprising shrubs and wood plants. Of these, 211 species are endemic to Zambia.

The fauna diversity is estimated at 3,631 and it is distributed as follows: - 2032 invertebrates, 409 fish, 67 amphibians, 150 reptiles, 733 birds, 224 mammals and 16 domesticated animals. In addition, there are about 598 species of microorganisms that have been identified to exist in Zambia. Microorganisms are very important in the maintenance of ecosystems through nutrient cycling.

### **1.2.3 Social Economic Environment**

Zambia's economic environment is characterised by heavy dependence on copper mining for the country's export earnings, government revenue, source of employment and Gross Domestic Product (GDP). Despite the potentials of other natural resources, the mining sector, will continue to play a role of driving force in the economic development of the country.

Unfortunately, the world copper prices have fallen drastically over the years. During the first and second republics, Zambia implemented socialist policies. This situation led to the registration of a cash stripped economy. As a result of this, the country has resorted to heavy borrowing, precipitating a high debt crisis.

Zambia is now one of the highly indebted countries in the world. The poor performance of the economy has had negative impacts on the development of nearly all sectors, and the living standards of the people have considerably declined. Zambia today, is recorded as one of the countries with the lowest GDP per capita of less than US\$ 350.

Poverty is widespread and intense in Zambia. More than 70% of the households live below the poverty datum line. The poverty situation in Zambia intensifies resource overuse and its degradation.

Zambia's human population is estimated to be 10.2 million and is growing at 3.1 % per annum. The current population is expected to double in the next 23 years. The factors that had contributed to high population growth between 1960 and 1980 prior to the prevalence of the HIV/AIDS pandemic were high fertility and reduced mortality rates. The HIV/AIDS pandemic is threatening the survival of many Zambians. The density of Zambia's population is estimated at 6 to 10 persons per km<sup>2</sup>. However, the population

density is higher in many localised areas due to immigration and urbanisation. Zambia is one of the most urbanised countries in Sub-Saharan Africa.

The poor social economic framework coupled with high population growth rates have had negative impacts on the status and management of Zambia's natural resources.

### **1.3 Environmental Problems**

The main environmental problems that affect Zambia today include land degradation, air pollution especially in mining areas, water pollution and inadequate sanitation, wildlife depletion and deforestation. These problems when combined lead to biodiversity loss.

### **2.0. The Desertification Problem in Zambia**

The problem of land degradation in Zambia has been caused by Natural, Environmental, Social, Economic and Land Tenure, as well as, Institutional, Policy and Legal issues have caused.

#### **2.1.1 Natural, Environmental Factors**

##### **Fragile Environment**

The location setting of Zambia within the sub-tropics bestows the country with an environment that is somewhat harsh, fragile and susceptible to land degradation. This is in terms of slopes particularly, in escarpments or hilly areas, soils, climate and water availability.

##### **Soils and landscapes**

About 80% of the country has low erosion hazard but there are many localised areas where the problem of land degradation has been or could be severe.

##### **Climatic Conditions**

The variability of the rain pattern in Zambia is according to a province. The Average annual potential evapo-transpiration ranges from 1 394 to 1 892 while the country average is 1574. This means that some parts of the country are in precipitation deficit. This situation has implications on water availability, and calls for sustainable management of water resources.

##### **Drought**

The effect of variable climatic factors of El Nino, poor precipitation, high temperatures and excess evapo-transpiration has in a number of years culminated into drought periods.

## **Water Availability**

It is noted that Zambia is highly endowed with water resources both ground and surface water. However, some of the areas in the country experience severe water shortage. This is due to the climatic variations in the nature of hydrogeology, poor ground water recharge due to siltation and sedimentation and over pumping through use of bore holes. In some areas particularly in the valley areas, the underlying rock is saline such that the water quality from ground supply sources is no longer useful for both domestic and irrigation purposes. Problems of availability of good quality water supply are critical particularly in the dry months in some areas. These phenomena also affect the hydrological processes and water regimes.

## **Ecosystem Resilience**

Zambia has a huge diversity of biological resources and ecosystems. Ecosystem complexity is a function of climatic elements including rainfall, temperature, evapo-transpiration, hours of sunshine and total solar radiation.

### **2.1.2 Social Economic Factors**

Poverty, land tenure, property rights, encroachment, new settlements and non-usage of indigenous knowledge and technologies have been identified as some of the social economic factors that cause land degradation in Zambia.

Agriculture is the mainstay for the majority of households in Zambia. Small-scale (mostly poor) farmers represent 79% of the farming community, while large-scale farmers are estimated at 1% of the total farming population. The emergent/medium scale farmers constitute 20% of the farming population.

Unsustainable practices of agriculture lead to land degradation in Zambia. Examples of such practices include shifting cultivation, monoculture cultivation, use of heavy machinery for cultivation, use of inorganic fertilisers, over-grazing, cultivation of wetland areas and cultivation on unstable landscapes.

Wood fuel and charcoal consumption does contribute to deforestation and eventually land degradation. Charcoal production also produces green house gases during carbonisation in the earth kilns.

Indiscriminate late bush fires have been observed to reduce wood annual increment by 50% in miombo woodland. In woodland areas, trees less than 3m high are generally susceptible to destruction when burnt and late fires destroy 84% of the herbage biomass.

### **2.1.3 Institutional and Legal Issues**

The Government has since the 1980s instituted a number of important institutional, policy and legal reforms, which could advance effective environmental management. However,

some of these are still underway like the decentralisation policy, which should ensure better involvement of the local populations and the civil society in all development activities.

There exist various Acts, which address issues of environmental management including land. Some of these Acts have efforts that are scattered, sectoral or out of date, and often not known by the general public.

Zambia does not have specific policy on desertification and drought. It is important to develop such a policy in order to address the problem of land degradation. In addition, Zambia has not incorporated the UNCCD in her law despite ratifying the Convention in 1996.

## **2.2 Manifestations and Effects of the Land Degradation Problem**

The effects of land degradation are multiple. These include loss of environmental benefits, such as, shelter, shade, visual amenities; and productivity of the land to support natural veld, livestock and crop production. At global level, the land degradation problem has negative implications on the hydrological cycle in particular on flood occurrence, drying-up of streams, poor ground water recharge systems due to high run-off rates and siltation and sedimentation of rivers. Deforestation reduces the carbon dioxide sink and this can lead to the destabilisation of the climate.

The low productivity of the land caused by land degradation causes low crop yields, poor animal productivity and animal diseases. Noting that the human population in Zambia is dependent on agriculture, these factors undermine social economic development, and continue to deepen the poverty crisis.

## **3.0 Relationship between NAP and other Programmes: An Analysis**

Zambia has for sometime developed multi-sectoral and sectoral programmes relating to the NAP. These show some adequacy between the orientations, strategies of various policies, nature of constraints to be removed and the potentialities exploited. These areas form avenues for NAP interventions and collaboration.

### **4.0 Programme Areas**

#### **4.1 Programme Vision**

To restore land productivity by using sustainable means of conserving it in order to reduce poverty and foster sustainable development.

#### **4.2 Programme Purpose**

The purpose of NAP is to identify the factors contributing to desertification and put in place practical measures necessary to combat desertification and mitigate the effects of drought.

### **4.3 Programme Objectives**

The NAP aims at contributing to sustainable environmental management through the reduction/control of land degradation, thereby contributing to Poverty Reduction, Food self-sufficiency and Food Security and ultimately contributing to Economic Growth. Its immediate objectives are:

- Reduce the destruction of land resources in affected areas
- Promote sustainable use of land resources
- Increase public awareness and information dissemination on matters of land degradation
- Provide a suitable policy and legislative framework for the implementation of NAP
- Establish and support effective administrative and co-ordination of the NAP
- Introduce and improve on assessments, planning and monitoring systems for the effective management of NAP, and
- Establish partnerships with multi-lateral and bilateral institutions in the management of arid areas.

### **4.4 Identified Programme Areas of Intervention**

To achieve the stated objectives, the following programme areas have been proposed according to their priority:

- Early Warning and Preparedness
- Forestry, Ecosystems and Species Conservation
- Water Catchment and Energy Conservation
- Collaboration and Networking
- Capacity Building of Programme Co-ordination Unit and Other Focal Persons
- Extension, Public Awareness, and Information Dissemination
- Land Degradation Assessments, Monitoring and Reporting
- Easy to use environmentally friendly technologies including Indigenous Knowledge
- Livelihood Improvement
- Food Self Sufficiency and Food Security
- Human Settlement Management, and
- Legal and Policy Reviews

### **4.5 Logical Framework and Action Plan**

An action plan based on the logical framework approach has been prepared. The approach shows in matrix form, the vision, objectives, outputs, interventions, activities, performance indicators, means of verification, assumptions, key players and timeframe. Detailed interventions and Action Plans for each programme is provided in Appendix IV.

A time frame of 5 years is proposed and activities costed, requiring US\$ 26.6 million in total for the whole programme period to implement the NAP. Government, donors,

NGOs, communities and other groups identified with the NAP, will support the proposed budget.

## **5.0 Implementation and Co-ordination Arrangements**

### **Institutional Arrangements**

An institutional mechanism for implementation and co-ordination of the NAP is proposed, involving the establishment of the National Co-ordination Committee on Desertification, the National Technical Committee on Desertification and Drought, Programme Management Unit (PMU) and co-ordinating committees at provincial, district and grassroots levels. The committees to be formed should be on principles of accountability and transparency. Other institutional measures suggested are ways and means of ensuring the full participation of all identified stakeholders of the NAP, co-ordination of NGOs and CBOs participation at national, provincial, district and grassroots levels through establishment of focal points and community institutions to co-ordinate and manage the programmes. International co-operation will be co-ordinated by the Donor Community Facilitator.

### **Funding Sources and Mechanisms**

Funding to implement programmes outlined in the NAP shall be mobilised through the Global Mechanism (GM), National Desertification Fund (NDF), The Cotonou Agreement and the Local Area Development Programmes (LADPs).

### **Conclusion**

It should be mentioned that the NAP prepared is an outcome of a consultative process and is a consensus of all the stakeholders that have been involved in the process. The NAP is also not a finite step, but a flexible process requiring interactive inputs and revision from time to time depending on circumstances. This output is not an elaborate project document, but a framework basis for preparation of detailed projects/programmes on land degradation for implementation. The NAP is therefore a contribution to the sustainable management and development of Zambia's land resources and in particular to combating a major global problem, land degradation.



## **CHAPTER ONE: BACKGROUND**

### **1.1 The United Nations Convention to Combat Desertification**

The United Nations Convention to Combat Desertification (UNCCD) was conceived out of concern by the international community which recognised that desertification was a major economic, social and environmental problem to many countries in all regions of the world. This resulted in convening of the United Nations Conference on Desertification (PACD) in 1977, which adopted a plan of action for desertification control. Despite PACD and other efforts made by the United Nations Environment Programme (UNEP) which concluded in 1991, the problem of land degradation in arid, semi-arid and dry sub-humid areas intensified. However, there were local examples of success (UNCCD, 1994).

Today, there are about 250 million people from over 100 countries that are directly affected by desertification with another one billion at risk. The projected increase in the world's population to 10 billion by the year 2050 will further stretch the carrying capacity of the earth. In addition, the increasing pressure from humans, animals, and climatic events, in particular recurrent droughts have exacerbated land-degradation processes.

As a result, the question of how to tackle desertification was still a major concern for the 1992 United Nations Conference on Environment and Development (UNCED) which was held in Rio de Janeiro in Brazil. This conference recognised that environmental concerns were inextricably linked to development and that the survival of present and future generations will depend on the promotion of sustainable development.

In respect to desertification, the conference supported a new integrated approach to combating the problem through emphasising action to promote sustainable development at community level. The conference called upon the United Nations General Assembly to establish an inter governmental committee to prepare by June, 1994 a Convention to Combat Desertification in those countries experiencing serious drought and /or desertification, particularly in Africa.

The Convention aims at combating desertification and mitigating the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa, through effective action at all levels, supported by international co-operation and partnership arrangements, in the framework of an integrated approach which is consistent with Agenda 21, with a view to contributing to the achievement of sustainable development in affected areas.

Achieving this objective will involve preparation and adoption of long-term integrated strategies that focus simultaneously, in affected areas, on improved productivity of land, and the rehabilitation, conservation of land and water resources, leading to improved living conditions, especially at community level.

### 1.1.1 Definitions of Terms

According to the Convention to Combat Desertification the following terms are defined as follows:

1. '**Desertification**' means land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities.
2. '**Combating Desertification**' includes activities which are part of the integrated development of land in arid, semi-arid and dry sub-humid areas for sustainable development which are aimed at:-
  - i) prevention and /or reduction of land degradation
  - ii) rehabilitation of partly degraded land, and
  - iii) reclamation of desertification land
3. '**Drought**' means the naturally occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect the land resource production systems.
4. '**Mitigating the Effects of Drought**' means activities related to the prediction of drought and intended to reduce the vulnerability of society and natural systems to drought as it relates to combating desertification.
5. '**Land**' means the terrestrial biophysical system that comprises soil, vegetation, other biota and the ecological and hydrological processes that operate within the system.
6. '**Land Degradation**' means reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed crop land, irrigated cropland, or range, pasture, forest and woodlands resulting from land-uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as:
  - i) Soil erosion caused by wind and/or water,
  - ii) Deterioration of the physical, chemical and biological or economic properties of soil, and
  - iii) Long term loss of natural vegetation.
7. '**Arid, Semi-Arid and Dry Sub-humid Areas**' means areas, other than polar and sub-polar regions, in which the ratio of annual precipitation to potential evapotranspiration falls within the range from 0.05 to 0.65
8. '**Affected Areas**' means arid, semi-arid and/or dry sub-humid areas affected or threatened by desertification
9. '**Affected Countries**' means countries whose lands include, in whole or in part, affected areas.

### **1.1.2 Ratification of the UNCCD**

The UNCCD was initiated in 1994 and it came into force in 1996. Zambia signed and ratified the Convention in 1994 and 1996 respectively.

Zambia is also a party to some environmental conventions that have a bearing on matters of land degradation. These are reflected in **Appendix I**.

### **1.1.3 The National Action Programme and the Process**

To address the land degradation problems affecting the Country, Zambia has decided to come up with a National Action Programme (NAP). This is in line with the UNCCD objectives under Articles 2, 9 and 10 where the formulation and implementation of National Action Programmes forms the core to the implementation of the treaty. All affected parties are obliged to prepare, publicise and implement them as 'the central element' in their strategies. They are to be closely inter-linked to development policies and are to be updated through a continuing participatory process on the basis of lessons learnt from the field action and from the results of research.

According to the NAP process, it should provide a framework to incorporate long-term strategies to combat desertification and mitigate the effects of drought with national policies for sustainable development. Taking into account the causal factors and specific requirements of a particular affected country party, the NAPs shall include, as a requirement, and as appropriate, some or all of the following long term measures to combat desertification and mitigate the effects of drought. These measures have been outlined in Box 1.

#### **Box 1: Long Term Measures to be included in NAPs**

- Promote alternative livelihoods and improvement of economic environments with a view to strengthening programmes aimed at the eradication of poverty and at ensuring food security;
- Promote development of sustainable water harvesting programmes for irrigation of crops and livestock;
- Management or control of population dynamics;
- Promotion of sustainable management of natural resources and agricultural practices;
- Development and efficient use of various energy sources;
- Strengthen institutional and legal framework;
- Promote and develop co-operation and co-ordination, in the spirit of partnership, between the donor community, government at all levels, NGOs, local populations and community groups, and facilitate access by local populations to appropriate information and technology;
- Strengthening of capabilities for assessment and systematic observation including climatological, hydrological and meteorological service;

- Strengthening of drought preparedness and management, including drought contingency plans;
- Strengthening of capacities, education and public awareness

The Zambian NAP detailed in this report was formulated along the above guidelines through a consultative process, which started in 1996. It was co-ordinated by the UNCCD National Focal Point housed in the Ministry of Tourism, Environment and Natural Resources. This process is detailed in Box 2.

**Box 2 : The NAP Process**

- National Steering Committee (NSC) meetings. The Committee, chaired by the Permanent Secretary, Ministry of Tourism, Environment and Natural Resources (MTENR) is composed of 21 representatives of key government ministries, one NGO, private sector and a Quasi-Government institution. The Committee provided policy and technical guidance to the NAP process. A number of meetings have been held to this effect.
- Provincial Meetings were held in 1998 in five provinces of regions I and II that are severely affected by desertification. Stakeholders, traditional rulers and local government authorities were represented. The aim of the meetings was to obtain information on desertification issues in the province and propose actions for combating desertification and mitigating the effects of drought.
- National NGOs Forum: Most NGOs and CBOs representatives, community representatives, government representatives, representatives of women groups and the private sector attended this Forum. The aim of this workshop was to select an NGO Focal Point institution, identify problems of NGOs/CBOs in execution of desertification programmes and identify areas of NGOs/CBOs involvement.
- National Forum: This was attended by all identified key stake-holders from government departments, NGOs, CBOs, donor community, quasi-government institutions, private sector representatives, Research Institutions and the University of Zambia. The aim of the workshop was to deliberate and synthesise the issues from provinces and identify, propose and formulate action programmes to combat desertification.
- Technical consultancy reports to provide background information to the NAP Process. The reports include the following:
  - ◆ An inventory of non-governmental organisations working in the environment and natural resources management sector
  - ◆ NGOs Needs Assessment Programme Report
  - ◆ The Role of Traditional Institutions in the implementation of the Convention to Combat Desertification in Zambia
  - ◆ An inventory of key stake-holders to the National Action Programme for the implementation of the UNCCD in Zambia
  - ◆ An ECA Mission Report on the implementation of the UNCCD in Zambia
  - ◆ The role and capacity of NGOs and CBOs in the management of environment in Zambia

In addition, working papers were also presented at the various workshops/meetings on the following topics:

- Rainfall patterns and drought in Zambia
- Gender and desertification in Zambia
- Social economic issues of desertification
- Land-tenure and property rights in Zambia
- The Role of NGOs/CBOs in the implementation of the CCD
- The effects of desertification on local communities
- Sustainable land and natural resources management in Zambia
- Role of women in combating desertification in Zambia.
- Drafting of the NAP framework document, which output constitutes this report. A Consultant was engaged to draft the NAP Framework Document.

Data gaps identified in the above were supplemented by literature reviews, interviews with key stakeholders and informants at the national level.

#### **1.1.4 Guiding Principles**

To prepare and implement the NAP according to the Convention, the following guiding principles have been agreed. The NAP shall:

- Ensure and facilitate the participation of concerned stake-holders and enhance partnership building and promote community participation;
- Build on past experiences;
- Contribute to furthering current sustainable development efforts and plans;
- Strengthen national and local capacities; and
- Establish mechanisms for follow-up and co-ordination, systematic monitoring and evaluation.

The NAP process should contribute to the following along with the above:

- Formulating and promoting the implementation of programmes based on priorities identified through a consultative process;
- Identifying all possible financing windows to ensure funding and consolidating the relevant on-going programmes;
- Providing better synergy and coherence between the various programmes at local and national levels and thus providing a framework for harmonisation of policies and improvement at local and national levels. It enhances international co-operation and co-ordination;
- Facilitating exchange of information, experiences and know-how amongst stake-holders;
- Rationalising and strengthening activities of national organisations dealing with desertification and drought to ensure more coherence and avoid duplication; and
- Ensuring economies of scale in the implementation.

The approach in preparing and implementing the NAP shall take into consideration community participation and gender.

#### **1.1.5 The NAP Area and Scope**

The NAP Document shall concentrate on five provinces of Regions I and II that experience severe problems of land degradation and drought. These provinces are Central, Eastern, Lusaka, Southern and Western Provinces. However, to prevent the problem of land degradation from spreading, there is need to promote the proposed action programmes in areas not yet severely affected by land degradation as a preventive measure.

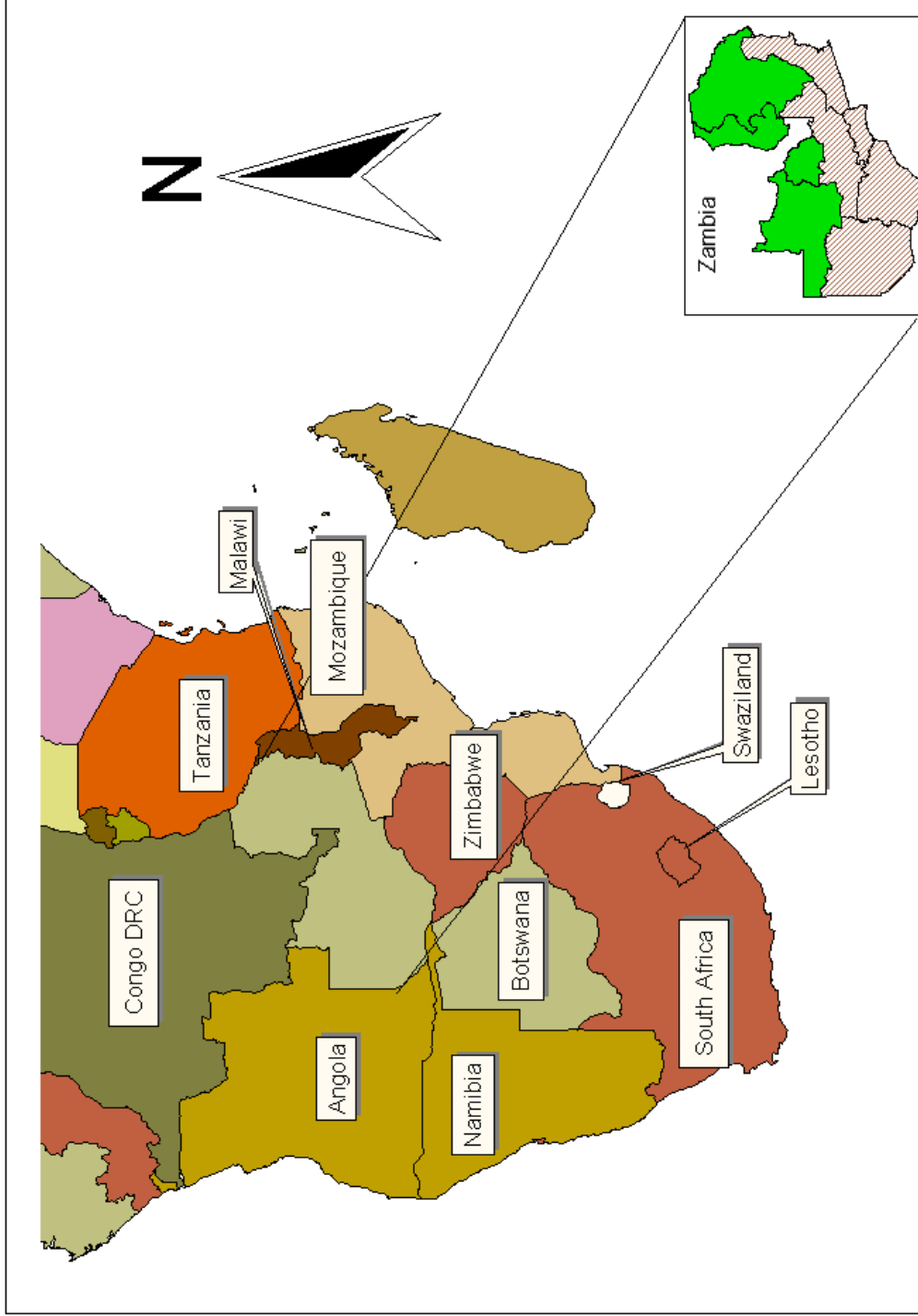
## **1.2 ZAMBIA**

### **1.2.1 Country Setting**

#### **Location**

Zambia is a sub-tropical Country located between latitudes 8° and 18° South of the Equator and between longitude 22° and 34° East. The country is landlocked. It is surrounded by eight countries namely, Angola, Botswana, Democratic Republic of Congo, Malawi, Mozambique, Namibia, Tanzania and Zimbabwe ( **Figure 1** ).

**Figure 1 - Location of Zambia**



## Physical Environment

### Land Systems

Zambia has a total land surface area of 752,972 km<sup>2</sup> with an average altitude of 1,200m above sea level. The altitude varies with highest parts in the northeast (1,500m - 2,000m above sea level), and the lowest parts in the south (350m – 600m above sea level) which is at the confluence of the Zambezi and Luangwa Rivers in Luangwa District.

The eastern and southern parts of the country are characterised by deep rift valley systems, which form part of the East African Rift Valley. The valley troughs are relatively flat but have hilly escarpments. The rift valley system comprises the Luangwa and the middle Zambezi valley. The predominant escarpment system is the Muchinga.

### Agro-ecological Zones

Zambia is divided into three agro-ecological zones of Regions I, II and III (**Figure 2**). The various characteristics for each of the regions are described in Box 3.

#### **Box 3: Agro-ecological Zones in Zambia**

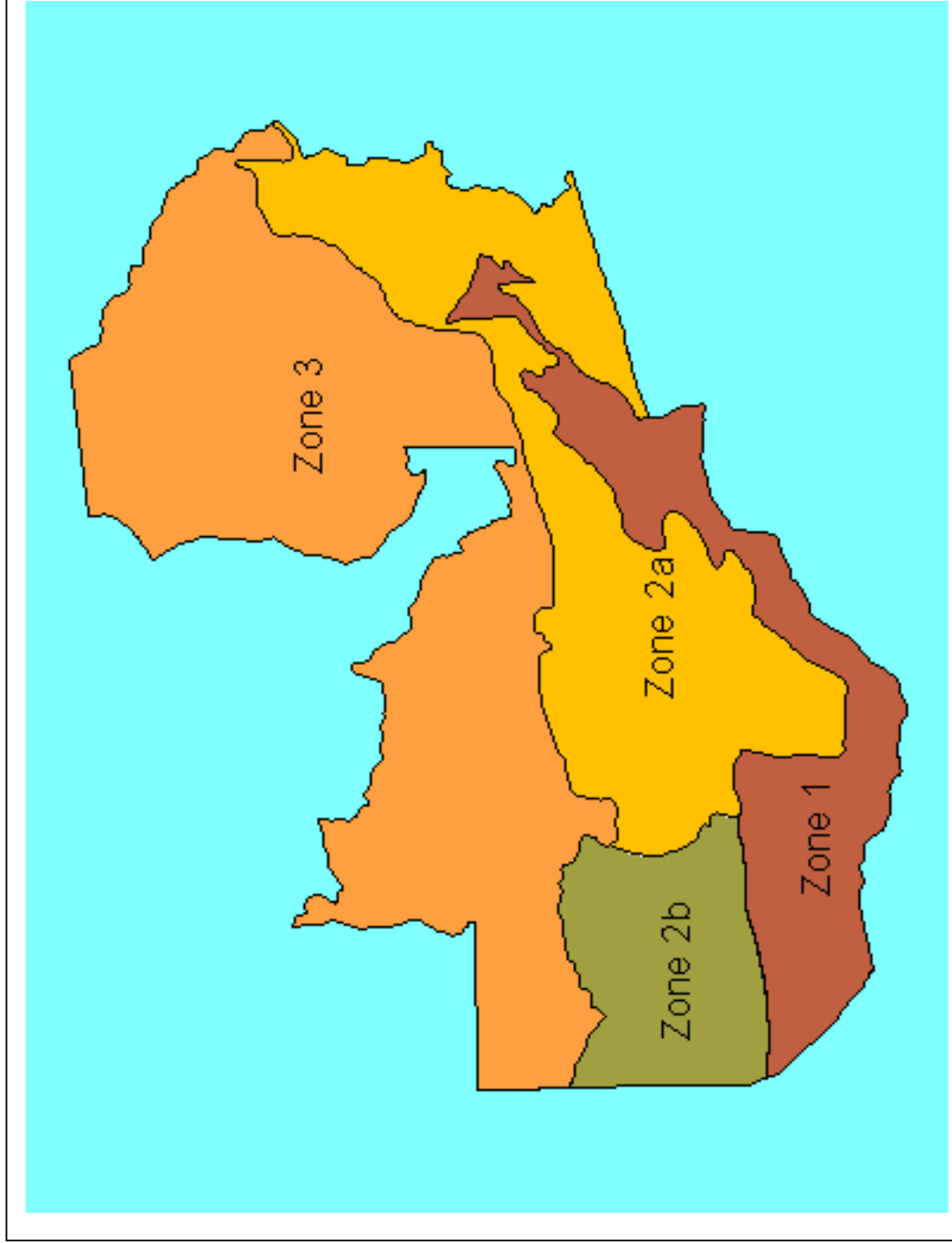
**Region I.** This covers the eastern and southern rift valley areas. It also includes the southern parts of Western and Southern Provinces. It is characterised by hottest and driest climatic conditions, with rainfall of less than 800mm per annum and is categorised as semi-arid. It has a short growing period (season) of between 80 and 120 days. The rainfall is highly variable and unreliable within one rainy season, and between the years; putting predicament on agricultural development. The rainfall intensities in this region are very high. These can induce the process of soil erosion if the land is devoid of vegetation through erosivity. The steep slopes along the escarpments have high erosion risk.

**Region II.** This region covers the sandveld plateau zone of Central, Eastern, Lusaka and Southern Provinces. The region is a medium rainfall zone with 800-1200mm per season, and has a growing season of 120-150 days. This is the most productive zone in the country. However, use of machinery, prolonged crop production over a period of time on the same portions of land and continuous application of chemical fertilisers have generally affected the natural soil qualities, and the soils are degraded.

**Region III.** This is part of the central African plateau covering Northern, Luapula, Copper-belt and North Western Provinces, as well as parts of Serenje and Mkushi Districts. The region is a high rainfall area of 1,200mm and above and has a growing season of up to 190 days. The high rainfall has resulted in considerable leaching and the soils are highly acidic, limiting the range of crops that can be grown in this region, especially if special farming practices are not employed.



**Figure 2. Zambia's Agro-ecological Zones**



## Soils

In general, the soils that have developed on the plateau region of northern and north-western parts of the country in *agro-ecological Region III are the strongly weathered, highly leached and very strongly acid clayey to loamy soils*. The eastern and south central plateau *has moderately leached clayey to loamy soils with medium to strong acidity*. These soils are found in *agro-ecological Region IIa*. In the western part of the country the soils are *very strongly to strongly acid, coarse to fine sandy soils* with more than 90% quartz developed over Kalahari sands. This constitutes *agro-ecological region IIb*. The soils of the escarpment zone are *shallow, coarse to fine loam*. The valley trough has *loamy to clayey soils*. The last two geomorphic units *constitute agro-ecological region I*. The *sandy to heavy clay water logged soils* are found in the floodplains and dambos.

## Climate

The climate of Zambia is influenced by the three main factors: the Inter-tropical Convergence Zone (ITCZ), Altitude and El Nino. ITCZ is an area where two air masses from the northern and southern hemisphere meet, producing an active convective area, that in turn causes rainfall. It's movement north to south and back to the north in each rain season causes moist Congo air to prevail for a longer period to the northern parts of the Country than to the southern parts half of the country where dry south-easterly air flow is predominant at the start and end of the seasons. Hence the northern receives more rains than the southern. Altitude causes low temperatures in the broad belt plateau country, from what would otherwise be harsh tropical climate. El Nino is the warming of sea surface temperature in the Pacific Ocean in certain years causing wet and dry conditions in some parts of the Globe. In Zambia most El Nino events have been associated with drought.

Zambia is characterised by three distinct seasons: the warm rainy season (November to April), the cool dry season (May to July) and the hot dry season (August to October). The Country experiences temperatures ranging from 16°C to 27°C in the cool-dry season and from 27°C to 38°C in the hot dry and warm rainy seasons. The high altitude areas experience cooler temperatures than the low-lying regions.

Zambia receives an annual average rainfall of about 1,000mm countrywide. Rainfall varies on average from 1,400mm in the north and to 600mm in the south.

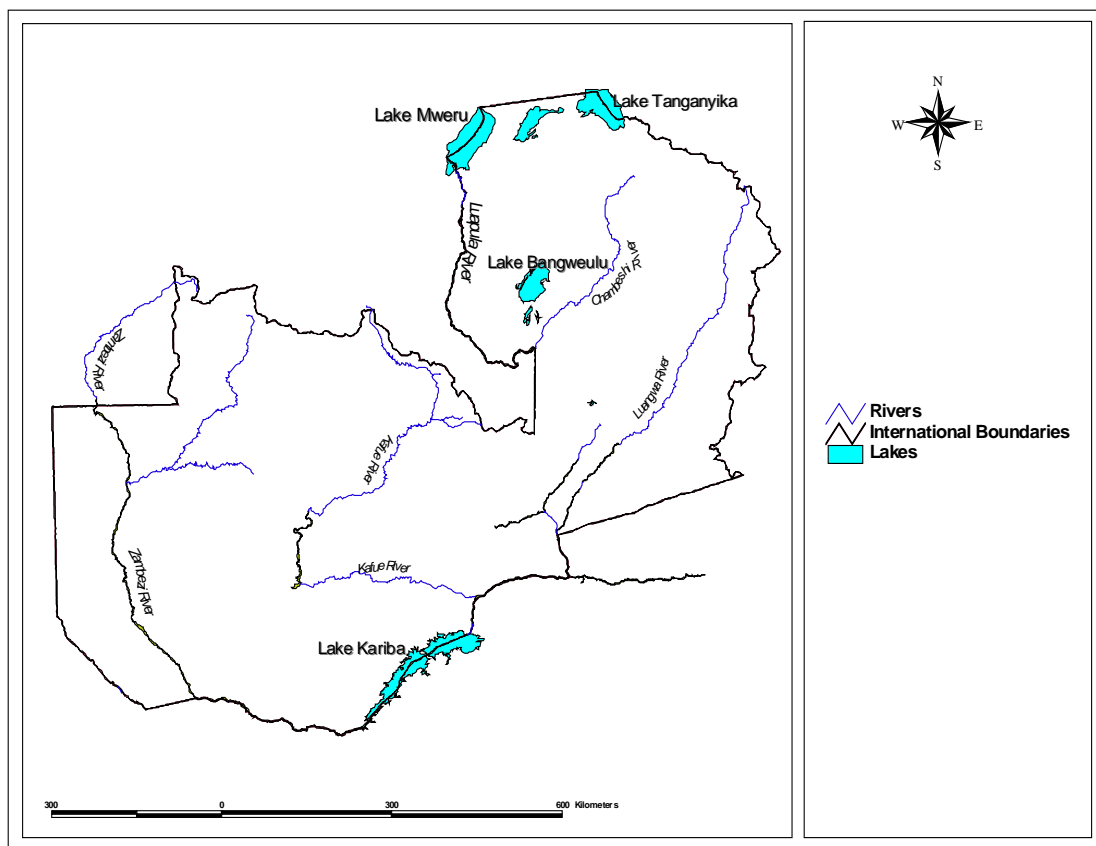
## Water Resources

Zambia is well endowed with surface and ground water resources. The major perennial rivers constituting surface water include the Zambezi, Luangwa, Kafue, Kabompo, Luapula and Chambeshi. The major lakes of Zambia are Bangweulu, Kariba, Tanganyika and Mweru.

Surface water from these rivers cover about 6% of the Country (ZFAP, 1997). If all the wetlands are included, surface water covers 20% of Zambia's surface (Chabwela, *et al*, 1994). See **Figure 3**.

The water bodies also constitute wetlands areas of Zambia such as Kafue Flats, Bangweulu Flats, Zambezi FloodPlain and Luangwa Valley Flood Plain. Some of these wetland areas are listed as wetlands of international importance under the Ramsar Convention.

**Figure 3. Major Rivers of Zambia**



## 1.2.2 Biological Resources

### Ecosystems

Zambia's sub-tropical setting places her within the Zambebian Regional Centre of Endemism that extends from Katanga in the Democratic Republic of the Congo to Transvaal in South Africa, representing characteristic features of both semi-arid and tropical environments.

### Vegetation

Forests cover 60% of the country. The country's vegetation is classified into four major categories (Storrs, 1995). These are *Closed Forests*, *Open Forests*, *Terminaria* and *Grass Lands*. Table 1 below gives the extent of these vegetation types.

**Table 1. Vegetation Types of Zambia**

Vegetation Type	Area, 1000 ha	Proportion - %
<b>1. Closed Forests</b>		
Parinari	420	0.06
Marquesia	430	0.06
Lake Basin	15,560	2.07
Cryptoseplum	15,210	2.00
Baikiaea	6,830	0.91
Itigi	1,900	0.25
Montane	40	0.01
Swamp	1,530	0.20
Riparian	810	0.11
<b>2. Woodland (Open Forest)</b>		
Miombo	311,460	41.41
Kalahari	85,460	11.36
Mopane	38,700	5.15
Munga	32,600	4.34
Termitaria	24,260	3.23
<b>3. Grassland</b>	206,350	27.44
<b>4. Open Water</b>	10,500	1.40
<b>TOTAL</b>	752,060	100.00

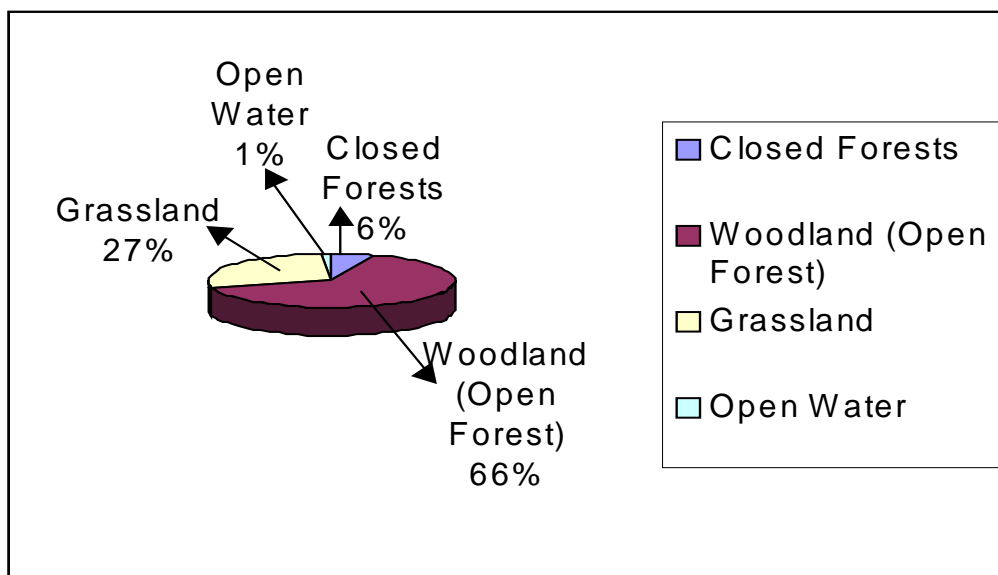
Source: GRZ, 1998

The closed forests are limited in extent, covering only about 6% of the country. The *Cryptosepalum* evergreen forests are the most extensive and occur in the western part of the country while the *Baikiaea* forests found in the south west parts of the country are the second most extensive forests characterised by the commercially valuable indigenous tree species known as *baikiaea Plurijuga* (State of the Environment in Zambia, 2000: pp.).

The open forests or woodlands known as Savannah woodlands are the dominant vegetation type in Zambia covering 66 % of the land. There are four types of these woodlands of which the most extensive being the Miombo woodlands that covers about 42% of the country characterised by the *Brachystegia*, *Julbernadia* and *Isoberlinia* species. This is followed by the Kalahari woodlands, Mopane, Munga and *Termitaria* (Ibid).

*Termitaria* or anthill vegetation covers about 3.23 % and is present in all regions of the country except in areas of pure sand. This vegetation type is classified according to its association with other vegetation types; hence the classification; Miombo *Termitaria*, Kalahari *Termitaria*, Mopane *Termitaria*, Munga *Termitaria*, Riparian *Termitaria* and Glassland *Termitaria* (Ibid).

Grasslands cover 27% of the land area in Zambia and ranges from pure grasslands to grasslands with scattered trees. They occur in poorly drained dambos, flood plains or swamps (Ibid).



**Figure 4: Vegetation Types of Zambia**

Zambia has an estimated floristic diversity of over 3,774 species, 40% comprising shrubs and woody plants. 211 of these species are endemic to Zambia (MENR,1999).

### **Values and Uses of Forests**

Forest resources have an immense value to the Zambian society and provide valuable environmental services that ensure the continuation of ecological processes that maintain biodiversity. Forests maintain the ecological balance through maintenance of water and nutrient cycles, control of soil erosion and land degradation and regulating climatic parameters such as temperature, rainfall, just to mention but a few. Forests support livelihood systems through provision of plant food fruits, stems, tubers, leaves as well as, flowers and animal proteins for invertebrates, fish, birds and mammals. Plants are also directly used for treatment of diseases as medicine. They are also exploited for commercial gain at household, community and national levels.

### **Fauna**

Zambia is blessed with a wide and rich diversity of ecosystems including vast areas of wetlands. These form a home to a wide variety of fauna species. Among these species, fish and mammals are the most valuable, making Zambia an important destination for tourism in Africa. They are also an important source of protein for the majority of the people in Zambia. The Black Lechwe, which thrives in swampy areas, is known to exist only in Zambia.

The fauna diversity is estimated at 3,631 and distributed as follows: 2032 invertebrates (27+ endemic), 409 fish (204 endemic), 67 amphibians (1 endemic), 150 reptiles, 733 birds (76 rare or endangered), 224 mammals (28 rare or endangered) and 16 domesticated animals (MENR, 1999). Under the wildlife statutes, 28 mammals, 36 birds and 4 reptiles are under protection. The list of protected species has however not been reviewed for some time now.

Protected areas have been established because of the diversity of habitats and the associated flora and fauna that has regional and international importance. Zambia has a very good network of protected area systems comprising 19 national parks, which cover 8% of the country and 34 game management areas covering 22% of the country. An additional 10% of the land is protected forest area, making a combined 40% of the land in Zambia under protection. The protected areas network also includes bird sanctuaries, game ranches, botanical reserves and national heritage sites.

Through sustainable management practices, wildlife (including fish) resources contribute significantly to local and national economies through revenue generation and sustainable supply of protein food for a variety of species that are abundant.

## **Micro-organisms**

There are about 598 species of micro-organisms that have been identified to exist in Zambia. These consist of 12 species of bacteria, 446 of fungi, 4 of protozoa and 35 of viruses (MENR, 1999). The distribution of microorganisms is generally affected by rainfall and soil moisture content. Habitats with high rainfall have a higher variability of species and greater numbers of individuals per species.

Detailed information on distribution and abundance of microorganisms in different ecosystems is not readily available. There is need, therefore, to do bio-prospecting research on microorganisms, as recent scientific work has revealed the importance of the use of some of these organisms in modern medicine.

Microorganisms are also very important in the maintenance of the ecosystems through nutrient cycling. More effort is, therefore, needed to manage the habitats and moisture in the soils effectively for purposes of conserving microorganisms to meet the above uses. This is more crucial in the dry-land areas where rainfall is limited, vegetation is sparse and therefore biological activity is inhibited to promote the breakdown of organic matter and thereby releasing nutrients in the soil.

### **1.2.3 Social Economic Environment**

#### **Zambia's Economy**

Zambia's economy is dependent on copper mining, which earns about 95% of the country's export earnings, contributing 45% of government revenue and is a major source of formal employment and Gross Domestic Product (Imboela, 1996; after DHS 1992).

From independence to 1974, the economic performance was very impressive and experienced a boom in terms of foreign exchange reserves due to good copper prices on the international market.

The Zambian economic environment started deteriorating when the copper prices began to fall as from the mid 1970s, while the prices for oil rose. This entailed high oil import bills. During this period Zambia's exports also declined. This resulted in the depletion of the country's foreign reserves.

From independence to the 1990's, Zambia adopted socialist economic policies that were characterised by public sector domination in which government had overall control.

The economy was built on an extensive administrative control system following commandist socialist policies, which were characterised by nationalisation of most economic activities, import substitution in the industrialisation process and the use of price controls and subsidies. To meet its social obligations, Zambia has had to borrow heavily and is today one of the highly indebted countries in the world.

## **Economic Reforms**

In recognition of these problems, government since the 1980s began to implement a series of structural economic reforms, supported by the International Monetary Fund (IMF), the World Bank and other bilateral and multilateral agencies to try to reverse the trend in economic performance.

Currently, the government is implementing the ambitious New Economic Reform Programme (NERP) under the Structural Adjustment Programme. The programme aims at stabilising the economy in order to lay a foundation for economic sustainable growth and development. This programme focuses on the liberalisation of the economy and the privatisation of commercial undertakings. It also entails reformation of economic institutions and the implementation of the public sector reform programme with a view of improving efficiency and management. Dependence on the state has been reduced through promotion of private initiatives among the people. The programme has removed subsidies and the promotion of competition and market led activities. The government has promoted cash budget measures to scale down on expenditure.

The impact of the reforms has yet to produce positive results at the micro-economic level. The reforms have been associated with the collapse of formal employment, reduced real incomes and widespread poverty.

## **Social Environment**

### **Poverty**

It should be mentioned that the economic pressures facing Zambia puts her as one of the poorest states in the world. Poverty is widespread and intense in Zambia, as illustrated by the CSO's Living Conditions Monitoring Survey Report of 1996 and 1998. Measured in terms of real household incomes, expenditures, asset ownership, nutritional status, disease incidence and access to quality social support service and amenities, the reports show high incidence of poverty. 68% of the households were living below the poverty datum line in 1991, and this rose to 78% in 1996. It slightly declined to 73% in 1998.

The incidence of poverty according to the 1998 survey is higher in Zambia's rural and peri-urban areas (83%) like Western Province, than urban areas 56% (CSO, 1998). In terms of various strata, poverty is more serious among the most disadvantaged groups of society, namely the subsistence farmers, unemployed, women, children and the disabled.

There is a high correlation between poverty and environmental degradation as a result of poor people's dependence on exploitation of the environment for survival (UNDP's Zambia Human Development Report, 1998). The poverty situation in Zambia intensifies resource overuse and its degradation.



Increased unemployment has forced a lot of people to be engaged in informal sector activities as a coping strategy, mainly involving natural resource products in rural urban trade and unregulated or unsustainable forms of exploitation (Mupimpila, *et al*, 1998). These informal sector activities include agriculture (semi-shifting cultivation), harvesting of trees for firewood and for charcoal, logging of timber, gathering of plant materials for various uses, illegal commercial hunting and unregulated fishing. These activities if unchecked result into the degradation of the natural resources base.

In dryland areas, which are generally marginal and sensitive, heavy exploitation of natural resources to meet food needs, as a result of food shortages, would induce and enhance land degradation and impairing of the ecosystems.

## **Human Population**

### **Composition of the Population**

Zambia's population has grown rapidly over the years. Zambia's population enumerated at 4.1 million in 1969 grew to 5.7 million in 1980 and 7.4 million in 1990. In 2001, it was estimated to have grown to 10.2 million. The estimated population growth rate was 3.1% which is one of the highest in the world, implying approximately a 23 year doubling time of the population (UNDP, 1998). The structure of the population is characterised by a high proportion of youths 51%, under 16 years old. This indicates high dependency ratio. There are clear indications of considerable momentum for future population growth. This growth of the population is due to mainly high fertility rates, calculated at 6.7 children per woman and reduced mortality rates. These fertility rates are considered as one of the highest in Africa. Fertility rates are even higher in rural areas (7.0 children per woman) as compared to urban areas (6.3 children per woman). This is due to lower levels of literacy and contraceptive use in the former. High fertility rates complimented by lowered mortality rates between the 1960s and 1980s, led to the rapid increase in the Zambian population.

The mortality rate has begun to rise in the recent years due to the deterioration in living standards of many Zambians and the prevalence of the Human Immuno-Deficiency Virus/ Acquired Immune Deficiency Syndrome (HIV/AIDS).

Most of the population is dependent on natural resources for survival. This has serious implications on the country's physical environment. The government capacity to provide adequate services to its people and effectively manage natural resources is hindered by its constrained treasury.

According to 1990 census, the Zambian population is characterised by high proportion of females as compared to males. Out of every 100 females, 96.1 were males. As regards to households, 24% were female headed and 35% of these were in rural areas.

Females have special cultural problems as a result of their gender, for example, limited access to productive resources, poverty and heavily constrained with household chores, this distribution of population entails serious social economic problems with the Zambian female-headed households.

The increasing human population pressure on the resources, coupled with the competitive open access harvesting for day to day subsistence, have resulted into the cumulative demand pressures on the resources arising from commercial activities including those of the poor.

### **Population Density**

Zambia's population density was estimated at 13.5 persons per km<sup>2</sup> in 1998. The density varies considerably between areas and some locations have over 100 persons per km<sup>2</sup>.

There are a number of factors that have influenced population distribution and settlement patterns. These include availability of agricultural land. Kay (1971) points out that there is a close relationship between population distribution and soil types. This means that those parts of the country which have good agricultural soils, like Southern, Eastern and Central Provinces have high population concentrations, as people particularly in rural areas depend on agriculture.

Other factors include displacements, for example, construction of the Kariba Dam, which resulted in the displacement of the Gwembe Tonga from the valley to Lusitu area. This resulted in the concentration of people in areas like Lusitu (Siavonga) which are now heavily populated and severely degraded due to high population pressure and overgrazing beyond the area's carrying capacity.

Availability of water is another factor, which affect population distribution. People settle along perennial streams or major rivers, around swamps, lakes or big dambos for water supply, agriculture (including livestock) and fishing.

The other factor is tsetsefly distribution. Areas infested with tsetseflies are sparsely inhabited due to the prevalence of trypanosomosis, which affect both livestock and humans.

Migration and urbanisation influences population density or distribution. In Zambia, most rural areas have inadequate employment opportunities and social amenities. These aspects are closely associated with urban areas. Other benefits associated with urban areas are that they serve as service centres, which all factors combined trigger rural-urban migration in Zambia. This makes Zambia one of the most urbanised countries in Southern Africa. The outstanding problem resulting from the rural-urban influx has been the uncontrolled growth of squatter compounds in urban areas. The governments, both past and present, have had difficulties in providing housing and social services in these areas, especially given the economic decline Zambia is experiencing.

These social economic factors, coupled with increasing human population growth that exert demand on the declining government revenue base, reinforce the many disadvantages that exist in the Zambian Society. These have implications on land degradation.

Its worth noting that overcrowding in some areas of Zambia poses a threat to the environment. The increasing population growth rate and the existence of localised pockets and islands of densely populated areas entails over- exploitation of natural resources. This is evident from the standpoint of over- exploitation and the rates of deforestation, which correlate very closely with population densities. The threat is posed by wood-fuel demand (charcoal) and poor agricultural practices which contribute to deforestation and the problem of solid waste disposal and pollution, which when combined can result into land degradation and biodiversity loss.

### **1.3 ENVIRONMENTAL PROBLEMS**

The main environmental problems that affect Zambia today include air pollution in mining areas, deforestation, water pollution and inadequate sanitation, wildlife depletion and land degradation which when combined have led to biodiversity loss.

#### **Biodiversity loss**

The existence of every life form is dependent on the survival of the other forms of life including human life. The activities of over-exploitation appear to alter this balance and an increasing number of species are lost each day on earth, posing a serious threat to the existence of life. In Zambia, depletion of wildlife, fish resources and plant species resulting from illegal hunting, over exploitation and habitat destruction is a serious problem.

#### **Agriculture, Land-use Pressures, Deforestation, and the resultant Desertification**

The majority of the people depend on agriculture, forests and other natural resources for their survival. However, the practices employed to enhance production or extraction are detrimental to the natural resource base, resulting into land degradation. Unless sustainable land management systems are practised, land degradation will continue, posing a threat to biodiversity by causing imbalances in ecological processes and shortage of fresh water. Land degradation also has far-reaching implications like widespread poverty, significant disruptions in social economic systems, migrations and loss in land productivity.

#### **Other issues**

Other issues include growing amount of wastes and air pollution. In Zambia, there is increasing use of biomass energy, which increase carbon emissions and eventually contribute to global warming. This in turn has effects on life.

Air pollution is as a result of dust pollution from huge mine tailing dumps and sulphur dioxide emissions from mining operations in urban areas. Furthermore, increase in human population exerts pressure on resources and increases generation of waste matter.

#### **1.4 STATUS OF DESERTIFICATION**

The problem of desertification and drought occurs throughout the country but it is more severe in the southern half of the Country comprising Regions I and II that covers the Central, Eastern, Lusaka, Southern and Western Provinces (**Figure 5**).

A summary of problems associated with desertification and drought in the five mentioned provinces as cited in the consultative workshops held in 1998 on the UNCCD-NAP are as follows:

##### **Lusaka Province**

In Lusaka Province, desertification has caused the following problems: food insecurity, scarce energy resources, inadequate water supplies and adverse climatic conditions. The causes of food insecurity were identified among others as low yields, poor marketing and storage facilities. Scarce energy sources were as a result of deforestation and non-availability of energy alternatives. Droughts, lowered water tables and poor water management caused inadequate water supplies. Adverse climatic conditions were identified as being a result of deforestation and frequent droughts.

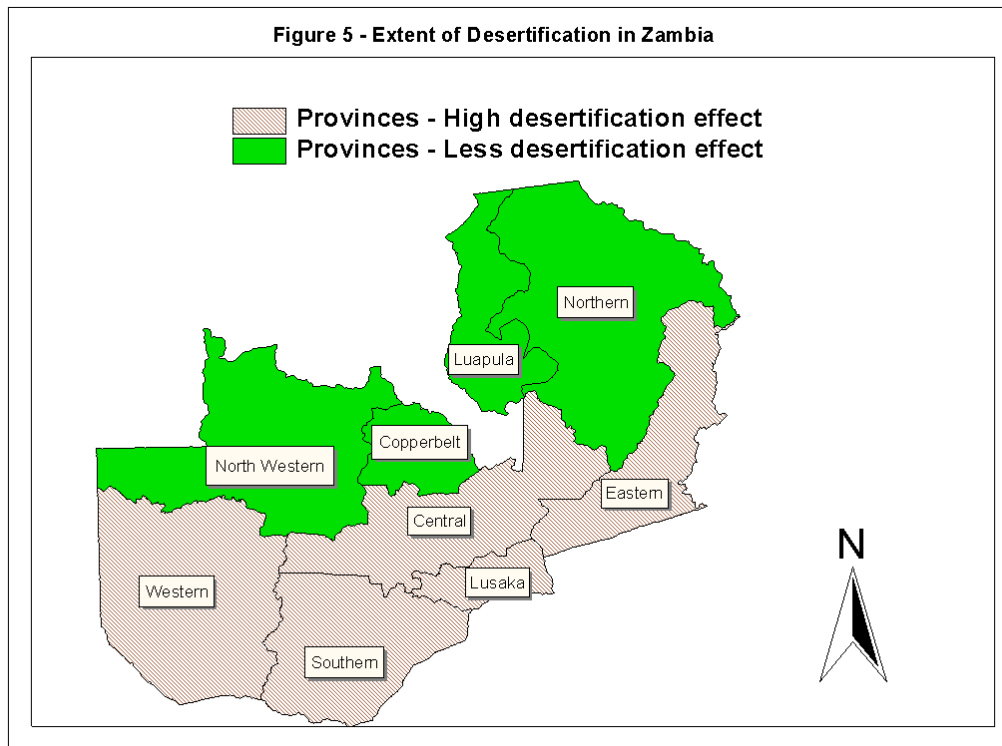
##### **Central Province**

In Central Province, major desertification problems included the following: reduced agricultural yields, reduced rainfall due to prolonged dry spells during the rainy season, reduced plant and animal productivity, low ground water supply, silting of water courses, salinisation of the soils and reduced quality of rangelands. The causes of these problems were listed as follows: poor land management practices, inadequate extension and technical support by relevant extension authorities, deforestation, global weather changes, increase in population, poverty, accelerated soil erosion, drought, overgrazing and uncontrolled bush fires.

##### **Eastern Province**

In Eastern Province, the following list represents the problems of desertification: poverty, low ground water levels, reduced soil fertility, soil erosion, and poor crop and animal productivity. The cause of which included; cultivation along streams and riverbanks, over-grazing, poor farming methods, population growth and rural-urban drift, for example, cultivation on hill slopes in Chipata.

**Figure 5. Extent of Desertification in Zambia**



### **Southern Province**

In Southern Province, the following form the list of desertification problems that were prevalent, indiscriminate cutting down of trees, soil erosion, inadequate pastoral lands, windy and dusty conditions, siltation, low water level, low yield and poor road infrastructure. The causes of which included the following: high energy demand, land clearing for farming settlements, poor methods of farming, uncontrolled rangeland management, late burning, intensive and rain storms and bare-land.

### **Western Province**

Desertification problems in Western Province included the following: soil erosion, deforestation, loss of soil fertility, drought, drying of rivers, aridity, climatic variation, loss of biodiversity, poor rangeland and sedimentation. The causes of desertification were listed as follows: uncontrolled cutting down of trees, overstocking, high localised density population, poor information and communication, poor drainage, poor harvest, over cultivation and poor pasture management.

## **CHAPTER TWO: DESERTIFICATION ASSOCIATED PROBLEMS IN ZAMBIA**

### **2.1 ROOT CAUSES OF DESERTIFICATION ASSOCIATED PROBLEM**

The desertification problem in Zambia is caused by several factors and has negative impacts on the people and the environment. Some of the root causes of this problem include among others Natural, Environmental, Social, Economic and Land Tenure factors, as well as, Institutional, Policy and Legal issues.

#### **2.1.1 Natural and Environmental Factors**

Zambia's biophysical environment is quite sensitive and fragile, particularly the southern half of the country in terms of steep slopes (escarpment areas), soils, climate and water availability.

##### **Geomorphological Systems**

Most of Zambia is a plateau, but due to geomorphologic processes that have taken place over a geological time-scale, this plateau and some hilly areas have been degraded. This is particularly true for eastern and southern parts of the country, which are covered by hilly escarpments and complex zones that form parts of the rift valley systems. These parts of the country have slopes of over 12%. The escarpment system is a very sensitive zone, in terms of the erosion hazard. Any disturbance to the vegetation cover in these areas can cause severe land degradation. Even though 80% of the country has no erosion hazard (NCS, 1985; Chipungu, *et al*, 1994; Chiti, 1989), there are many localised areas where the problem of erosion has been severe due to an inter-play of natural factors and human activities.

##### **Soils**

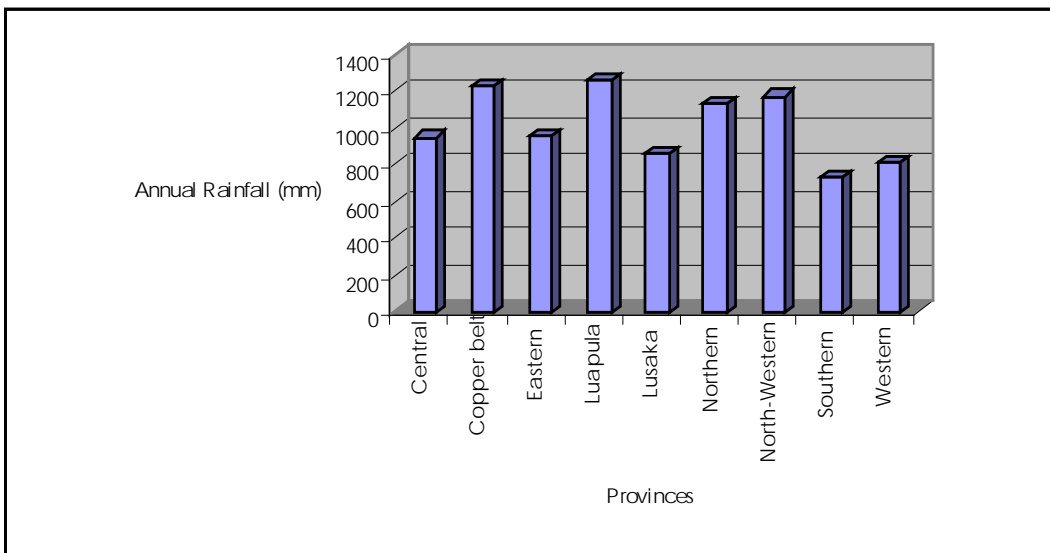
As earlier mentioned in Chapter 1, the Zambian soils are susceptible to erosion.

##### **Climatic Conditions**

The provincial average rainfall and rainy days in Zambia provided in Table 2 below, shows the variability of the rain pattern in the Country. The Annual Rainfall (mm) per province has been presented in Figure 5.

**Table 2: Provincial Average Rainfall and Rainy Days**

<u>Province</u>	<u>Annual Rainfall, mm</u>	<u>Annual Rainy Days</u>
Lusaka	857	77
Copperbelt	1,231	111
Central	947	86
North-Western	1,173	118
Western	808	87
Southern	737	74
Luapula	1,259	123
Northern	1,138	107
Eastern	961	93
<b>Country Average</b>	<b>1,001</b>	<b>97</b>



**Figure 6: Annual Rainfall (mm) per Province**

Due to relatively high temperatures, the average annual potential evapo-transpiration in Zambia ranges from 1,394mm to 1,892mm while the country average is 1,574mm. Potential evapo-transpiration is larger than precipitation in Zambia. This means that Zambia is in a hydrological condition of precipitation deficit that amounts from 100mm per year to – 1,100mm per year. This situation has implications on water availability and management in Zambia, particularly in agro-ecological Regions I and II.

### **Drought Occurrence in Zambia**

There has been an observed global change in climate over the past century due to a combination of natural factors and anthropogenic perturbations to the composition of the

atmosphere, such as volcanic eruptions and emissions of green house gasses associated with human activities.

As the atmosphere knows no boundaries, climate change has affected Zambia. Some of the global climate highlights during the period 1994-1998 that have had implications on Zambia include the following (after Chipeta, 2000):

- Floods, droughts and storms continued to inflict massive economic and human distress around the globe (Australia, China, Europe and U.S.A.). Southern Africa suffered a severe drought during 1993-1996. There was a large reduction in agriculture production due to extensive drought in 1994/95;
- The change to a Pacific cold episode (La Nina) of the Southern Oscillation Index during 1995 after five to six years in which warm episode (El Nino) prevailed;
- In 1995, the record for average global surface temperature was 0.39°C above the 1961-1990 normal average temperatures. Recording surface temperatures began in 1860;
- The earth global temperature is almost 0.7°C warmer than at the end of the 19<sup>th</sup> century.

Zambia's average climatic conditions have varied within normal range over the years but the following tendency has been observed in relation to the global climate change (Ibid).

- The start of the rainy season over the past 5 years has tended to start in the second decade (11-20) or third decade (21-30) of November in many areas of the country. In general, there has been a tendency for late onset of the rainy season since the early 1980s (after Mumba, 1995).
- There has been a tendency on average for early withdrawal of the rains since the 1980s. By end of March, the rains would have virtually stopped in most parts of the country, although a spell of widespread rain may occur in April or sometimes as late as May.
- There is no apparent indication of changes in the trend of total seasonal rainfall over the country but there have been several rainy seasons that have exhibited mean seasonal rainfall below normal.
- In terms of seasonal rainfall changes, the period from 1972 to 1996 has experienced the most severe droughts over the whole country. The most affected has been Region I, which experienced not less than 8 droughts. These droughts have been largely due to the El Nino phenomenon.
- As regards to temperatures, it is shown that since the early 1970s, there has been a modest warming in the cool season (June, July and August) mean minimum temperature, whilst considerable warming (by about 1° C) of the mean maximum temperature has been observed in the hot season (September, October and November) especially over the northern half of Zambia (Chipeta 2000, after Mamba, 1995).

It should therefore be noted that the effect of variable climatic factors of El Nino, poor precipitation, high temperatures and excess evapo-transpiration, particularly in the drier southern region of the country has in a number of years culminated into drought periods. This exerts stress on primary and agricultural production systems and other human activities dependent on rainwater. As for primary production, there is a strong correlation



between plant biomass and rainfall, since rainfall influences vegetation production (WMO, 1997).

The 1967/68 season is said to have marked the beginning of a period of successive dry years across Africa, including Zambia and wet years have been rare. The effects of drought have included shortages of drinking water, food shortages, high mortality rate to both livestock and wild animals, reduced hydro-generated power and shortage of water transport.

The problem of prolonged drought has linkage and reinforces the problem of desertification in Zambia.

Proper contingency planning and adequate mechanisms for preparedness should be put in place to take care of the problem to minimise its impacts. Management and efficient use of the water resources and promotion of appropriate water harvesting and irrigation systems are important aspects for mitigating the negative effects of drought.<sup>1</sup>

### **Water Availability**

Zambia is endowed with both surface and groundwater resources, though some parts of the country experience severe water shortages. This is due to human activities which have tended to induce erosion and sedimentation, in combination with climate variability and variations in hydrogeology from the northern part of the country to the southern and the valley regions. There are remarkable differences between the regions in the water regimes of either underground or streams and rivers. The northern plateau region, which is well watered, provides the headwaters of most streams and rivers. These rivers are perennial. The streams that drain the southern and valley parts of the country are, however, (seasonal) ephemeral, as they only flow after a heavy down pour. Seasonal flush flooding is a common phenomenon, which given the impermeable sub-surface layers leads to flooding in the lower valley regions.

### **Ecosystems Resilience**

The ecosystem complexity is a function of climatic elements including rainfall, temperature, evapo-transpiration, hours of sunshine and total solar radiation.

## **2.1.2. Social Economic Factors**

### **Poverty**

Poverty is a cause as well as a consequence of land degradation in Zambia as outlined in Chapter 1 under the sub-section discussing Poverty.

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<sup>1</sup> Appendix II provides a list of episodic events in the climate of Zambia up to date.

## **Land-Tenure and Property Rights**

It is generally argued that a significant cause of environmental degradation lies in inadequate institutions particularly ill defined property rights.

Property rights can be defined as consisting of bundles of entitlements defining rights and duties in the use of natural resources, and property rules under which those rights and duties can be exercised (Hanna & Munasinghe, 1995). There are four types of property right regimes namely: private, common, state and open access.

In Zambia, land is divided into Customary and State Land. Customary land as defined by the 1995 Lands Act is land falling under traditional rulers and chiefs and constitute 94% of the total land area in Zambia. State land is mainly along the line of rail and is owned by the state. It constitutes 6% of the total land surface area of Zambia.

The 1995 Lands Act abolished the distinction between two types of land but combined them into customary land under customary tenure. The local residents through chiefs can obtain title to land. This entails assigning ownership to individuals and guaranteeing to those owners control of access and to the right of socially acceptable uses. This Act recognises the traditional systems and the role of traditional leaders in natural resources management through community participation.

## **Land Use Practices**

### **Agriculture**

Agriculture is the mainstay for the majority of households in Zambia. It provides the bulk of food and cash requirements. Much of this is dominated by small-scale farmers representing 79% of the farming community (IFAD, 1993). Current estimates put the total number of small-scale farmers at 600,000 (MAFF, 1998). Large-scale farmers are estimated at 1% of the total farming population, while emergent/medium scale farmers constitute 20% of the farming population. The sustenance of agricultural production and land productivity at certain levels have meant adoption of farming systems and technologies by different types of farmers depending on the agro-ecological zone.

Clearing forests for agricultural production is the major cause of deforestation. In Zambia, it is estimated to account for about 90% of forest clearing. Most of the agricultural activities such as large-scale agricultural clearing systems, cultivation along streams or riverbanks and the semi-shifting cultivation prevalent in Zambia have resulted into detrimental effects on the environment. It has been observed that the cut and burn semi-shifting cultivation practice in areas where population densities are high and the poor method of cutting trees is used, slows down the regeneration process.

## Wood Fuel and Charcoal Use

Energy resources available in Zambia include wood fuel, electricity, petroleum, coal, solar and wind. The national energy consumption in 1996 showed that 72% was wood fuel (firewood and charcoal). It is important to note that out of the total energy resources available, households consume 68.5%. Wood fuel constitutes the largest resource base. In the same year it was reported that households consumed 88% of firewood and 96% of charcoal. Charcoal is used by 85% of urban households for cooking and heating (Siamwiza, 1999).

The current trend of wood fuel consumption is projected to increase by 79% and the amount of wood that is converted to charcoal is expected to increase by 119% in the year 2016 (ZFAP, 1998). This demand has implications on the available forest resources. Due to the high demand and high prices it fetches in urban areas, charcoal is increasingly becoming an important source of income for the peri-urban people.

The effects of charcoal production as a deforestation factor has been well documented. In Zambia, one full-time charcoal producer is capable of clearing 0.5 ha per year (Chidumayo, 1988). With increasing demand and as many people are entering into this venture as an economic activity, the hectareage cleared per year is indeed great. Due to this clearance, most of the forests around Lusaka have been deforested, such that the pattern of charcoal production and supply has shifted from the western and north-western in the 1970's and early 1980's to the Central and Eastern parts of Chongwe District during the 1990's (Ibid.).

Charcoal production is done through the kiln method. This method impacts on woodland regeneration at two levels of intensities: the cut-over area in which most of the trees are cleared and the kiln spot where regeneration is severely affected due to thermal effects on plants and soil. Tree regeneration is known to be impaired on kiln spots up to two decades (Chidumayo, 1998). The problem of deforestation as caused by charcoal production is said to have a great significance on the Copperbelt, Central and Lusaka Provinces, where 76% of the urban population lives (NEAP, 1994).

The other environmental problem associated with charcoal production is the production of green house gases during carbonisation in the earth kilns, and this could be contributing to the climate change problems facing Zambia. As for firewood, the problem of deforestation is not severe in low-density rural areas where the use is specifically domestic. This is because, dead wood is mostly collected and used as firewood. However, studies in Siavonga (Kalyocha, 1997) and Luangwa (Kalyocha, 2000), show that firewood collection is a major problem causing deforestation around villages along the Rivers.

Firewood, in such circumstances is used mainly for fish smoking. Some tree species are reported to be completely destroyed, for instance, the Mopane along the Zambezi River. In densely populated and high fuel wood demand areas, it has also been noted that live trees are felled in order to obtain firewood and charcoal.

## **Bush - Fires**

Setting of bush-fires is a common phenomenon in the Zambian society. Some fires are, however, set indiscriminately. Various communities set bush-fires for a number of reasons which include among others the following: vegetation control and fire-breaks around home steads and gardens, clearing of fields for cultivation, provision of potash, visibility improvement during hunting as well as gathering and pasture management.

Fire destroys the vegetative cover in the agriculture area, which is meant to add organic matter to the land. Indiscriminate late bush fires have been observed to reduce wood annual increment by 50% in miombo woodland (NEAP, 1994). However, deliberate late burning of pasturelands can indeed increase their productivity (a late season burn favours regeneration of grasses, rather than woody species). In woodland areas, 75% of trees of less than 3m high are generally susceptible to destruction (NCS, 1985) and late fires destroy 84% of the herbage biomass (Chiti, *et al*, 1989). In tree-less areas, and in the dry season, burning may promote soil erosion by wind and by water at the on-set of the rain season before sufficient herbage cover develops (Ibid.). These factors reduce the potential of the woodland to regenerate.

## **Over-Grazing**

Zambia has on average a total herd of livestock of slightly over 2 million animals but varies annually mainly due to animal mortality. The issue of over-grazing and deforestation in Zambia depends on the type of management practices such as no rotational grazing, no supplementary feeding system, no control of animal numbers according to carrying capacity of the land and concentrating grazing pressure in localised pastoral areas. The potential available pastureland is estimated at 10 million ha and only 2.7 million ha is available for dry season grazing (NCS, 1985). Dry season grazing is concentrated in dambos and flood plains. The potential grazing land gives a carrying capacity of 15 ha per animal as opposed to 5 ha per animal at the present use. Most of the animal concentrations are in Regions I and II and most of the grazing is free-range on communal areas. The concentration of grazing effort in localised areas without a controlled range management system has resulted in over-grazing.

There is noticeable evidence of this phenomenon in Lusitu in Southern Province, Katete (Kagoro) in Eastern Province and Luangwa in Lusaka Province. Over grazed areas are bare with signs of gully formations and thus inducing lots of soil erosion (Kalyocha, 2000).

The reasons for overgrazing and soil erosion are that:

- Too many animals on a piece of land leading to over-grazing and trampling causing compaction whose aggregates results into soil erosion.
- Young bushes and trees are destroyed through browsing. Goats are particularly destructive in this respect, leaving the land devoid of vegetation.

In the affected provinces, there have been some gradual deterioration in pastoral resource base in localised areas linked to over-grazing and eventual soil erosion. The low productivity and deaths of livestock reported in Eastern, Lusaka and Southern Provinces (Section 2.3: Veterinary Department Annual Reports) could be attributed to disease, poor management and range land degradation (NCS, 1985). This leads to a decline in the animal productivity of range land vegetation.

The problem of over-grazing has also been observed in wildlife areas, especially in the Luangwa Valley due to high densities of elephants in the 1970s (Caughley, 1975) and hippos in the Luangwa River stretch (Kalyocha, 2000; Jachmann, 1994). Due to high concentrations of the elephant populations in the 1970s, this exerted high browsing pressure on the vegetation, particularly Mopane woodland and large areas were left bare. With drought and the impact of fire, most of these areas have not regenerated and have remained bare or have been converted into grasslands (Ibid). The increase in concentrations of hippos in the Luangwa River (Central Luangwa Valley) in densities of over 40 animals per km river stretch in recent years has been observed to correlate with the elephant 'problem' but in turn is also causing grazing pressure on the riverine areas (Jachmann, 1994). Signs of grazing pressure in form of soil compaction due to trampling, erosion hills and gullies are evident in the Luangwa.

Due to nutritional stress as a result of habitat degradation in hippos, the reproductive rate is delayed, and the animals are susceptible to high mortality when there is a disease outbreak, particularly anthrax (LIRD 1996, Annual Report).

### **Encroachment and New Settlements**

Deforestation is also caused by in-migrations in some areas that are forested and sensitive to degradation. Out-migrations from Southern Province into Lusaka Rural due to shortage of arable land is causing areas to be opened up for new settlements. A case in point is the area from Chongwe to Rufunsa where new immigrants from Southern Province have been settled in the margins of the Lower Zambezi National Park (Kalyocha, 1997). About 400 ha have been deforested by new settlements and there have been cultivations in the National Park (Kalumba, 1997).

### **Indigenous Knowledge and Technologies**

There exist within the traditional land-use systems, practices that encourage conservation of land resources and maintenance of soil productivity. They include zero tillage, inter-cropping, crop rotations, strip farming, mulching, use of manure and many others. These need to be documented and used in combating land degradation.

## **2.1.3 Institutional, Policy and Legal Issues**

Zambia lacked a clear and consistent environmental management policy until the mid 1980s. Accordingly, environmental concerns were not a major input in the social and economic development processes of the country. In addition to the absence of a

consolidated 'environmental policy', there has been a myriad of various pieces of legislation dealing with different aspects of the environment, some dating as far back as the pre-independence era and others have not been reviewed. These pieces of legislation were scattered in different Acts relating to many activities such as use of water, wildlife, land, mining and others. These have been noted to be rudimentary, sectoral, scattered and at times contradictory to each other (Mweene, 1998, after Imboela, 1996).

The government attempted to overcome this problem through the formulation and implementation of the National Conservation Strategy (NCS) in 1985. This saw and marked the beginning of serious attempts by the government to incorporate environmental management considerations including issues of land degradation in the mainstream development process of the country. Apex institutions, Environmental Council of Zambia (ECZ) and the Ministry of Tourism, Environment and Natural Resources (MTENR) were created, including the enactment of the Environmental Protection and Pollution Control Act (EPPCA).

Despite these developments, environmental management efforts are still sectoral, scattered, out of date with present circumstances and uncoordinated with limited institutional enforcement capacity and support (MENR, 1999). Currently, there is still no consolidated policy and legislation for the environment, though the matter is being addressed through the Environmental Support Programme (ESP). There is also inadequate policy addressing desertification and drought. Zambia despite ratifying the UNCCD, has not incorporated it in her legislation. However, a draft policy has been formulated with regard to overall disaster management issues, but has not yet been ratified by Cabinet. The decentralisation policy is also not yet ratified.

MTENR is addressing the problem of land degradation through the Environmental Support Programme, existence of a National Focal Point (NFP) and National Steering Committee (NSC) of the UNCCD. In order to adequately address the land degradation problem, it is important to strengthen the co-ordination structure and also establish frameworks at all levels that bring together stakeholders on the subject.

## **2.2 MANIFESTATIONS AND EFFECTS OF DESERTIFICATION PROBLEMS**

Land degradation manifests itself through deforestation, biodiversity loss, soil erosion, soil infertility, siltation, sedimentation and flooding.

### **Deforestation**

Deforestation is the widespread removal and disappearance of vegetative cover as a result of clearing of trees. In Zambia, the average rate at which forests are deforested is calculated at 250,000-300,000 hectares per annum and the annual forest decrease factor is 0.5% on average. The annual decrease factor of forests by the province is as follows: Copperbelt and Lusaka have the highest at 20% per annum, followed by Southern (0.7%), Central (0.6%), Eastern (0.5%), Luapula (0.5%) and Northern (0.3%). The least are Western (0.2%) and North Western (0.2%). Deforestation is taking place both in forest reserves and open areas.

Management efforts appear to fail to halt the situation. These figures are, however, conservative ones, as these estimates are based on the 1960s inventories and the rate of deforestation could be higher at the present moment.

Field observations show clear signs of the problem the country is facing particularly around big urban settlements. Statistics from isolated case studies based on analysis of land cover maps, satellite images and aerial photography interpretation show that the problem is a serious one. Four percent (4%) of Siavonga District, for instance, is reported to be deforested (Kalyocha, 1997). Around Lusaka, particularly in east Chongwe, forests have decreased on average at a rate of 3.2% per annum between 1989 and 1998, with a highest rate of change of 8.8% occurring in munga woodland (Kalyocha, 2000 after Chaposa, 1999).

### **Biodiversity Loss**

The increased over-exploitation of forest resources in peri-urban areas, high population centres have posed problems resulting into deforestation and consequently loss of biodiversity.

Some tree species that are threatened in Zambia include *Daniellia alsteeniana*, *Entandrophragma devevayi*, *Baikiaea plurijuga*, *Podocarpus milanjanus*, and *Encepharlotos goetzi*. An example on tree species under pressure in Luangwa District as a result of human population pressure and decentralisation has been given in Table 2 below.

With regards to wildlife, some species under threat due to either habitat destruction and/or over utilisation are elephant, cheetah, eland, sable, roan, hartebeest, blue monkey, leopard and wild dog (Kalyocha, 2000). A study of the trade and utilisation of game meat in Zambia also added other species under threat to the list due to increased hunting pressure. These include buffalo, kudu, warthog, impala and duiker (Kalyocha, 1998).

As for fish resources, some species have been recorded to be threatened due to over utilisation and poor catch methods, for example, the lower Zambezi-Luangwa Valley fishing system has recorded mud suckers, sailfin fish, breams and tiger fish to be threatened (Ibid.). Farming activities are also reported to degrade the fishery habitats and breeding areas of the wetlands due to drainage of water through cultivation.

The conservation and management of these fishery areas and important animal habitats in the dry lands are very crucial for purposes of biodiversity conservation.

**Table 3: Tree species extensively used and which are under Pressure in the Luangwa Valley**

Tree Species	Most important use of the Tree	Other Uses
Mubuyu - <i>Adansonia digitata</i>	Fibre	Fruits, young leaves for relish
Mululu-Khaya <i>Nyasica (anthotheca)</i>	Timber and Canoes	Firewood and medicines
Mulombe- <i>Pterocarpus angolensis</i>	Timber	Medicine
Muzumba- <i>Kirkia acuminata</i>	Timber	
Mubanga- <i>Pericopsis angolensis</i>	Poles for Construction	Firewood, timber
Mupani- <i>Colospospermum Mopane</i>	Fire-wood, charcoal hard wood poles	Used locally in bridge construction, handles for hand tools
Mvungula (sausage Tree) <i>Kigelia africana</i>	Making of pounding mortars	
Milaza (palm) <i>Hyphaene verticosa</i>	For making hand-crafts, for example, baskets, hats and many others	Food source in hunger periods.
Reeds (Matete)- <i>Phragmites mauritianus</i>	Making mats, chicken run, coffins, and many others	
Bamboos - <i>Oxytenanthera</i>	For baskets (important in plateau areas)	
Black ebony- <i>Dalbergia melanoxylon</i>	Carving (sold to markets in Lusaka)	

*Source: Kalyocha, 2000*

### Soil Erosion

There are many localised areas in which the problem of soil erosion has manifested itself (Chiti, 1991, Chipungu, *et al*, 1994). Actual rates of erosion countrywide have not been estimated, but visible evidence of the problem is observed in localised areas of Central, Eastern, Lusaka and Southern Provinces. The problem of soil erosion was reported to be a serious one in these provinces during the provincial workshops.

These areas have the most productive soils, which the country entirely depends on for agricultural production. Given that in most Zambian soils, the highest nutrient concentration is in the top 0-10 cm layer, soil erosion can result into considerable losses of plant nutrients (NEAP, 1994).

The causes of erosion are rooted in poor land-use practices such as cultivation on sloppy areas without conservation measures, shifting cultivation, continuous mono-cropping and over-grazing which result into deforestation. Soil erosion in Zambia is correlated or associated with areas with high rural population densities, high livestock populations and



high percentage of land under cultivation. The cost of soil erosion in terms of agricultural productivity is very high. The most prevalent indicators of soil degradation are low crop yields and low livestock productivity, causing shortages of food and food insecurity. Farmers have therefore resorted to selling their animals, though of low quality, as a risk avoidance strategy and at the same time raising income to purchase food.

### **Other factors Leading to Soil Infertility**

Poor land management can lead to soil infertility. Apart from the problem of acidification and soil compaction, the problem of salinisation due to irrigation is yet another problem in Zambia, though on a small scale. It is not a major problem as yet, partly due to the fact that only a small hectareage (2%) of the estimated potential of the irrigatable land, (450, 000ha) is under irrigation. But given the irrigation potential and the strong need to expand irrigation schemes in these dryland areas as a result of drought, the problem of salinisation can be exacerbated which can lead to soil degradation.

The need to properly investigate and provide the appropriate irrigation system is strongly emphasised. The key to good irrigation is good drainage. If irrigated land is not drained properly, the soils first become waterlogged and then salinised or alkalinised. It, therefore, becomes difficult to cultivate as the evaporation of water from the soil increases, reducing the available moisture for crops.

### **Siltation, Sedimentation and Flooding**

There is visible evidence of the problems of siltation, sedimentation and flooding in Zambia, although the rates and extent of the problems are not well documented and known particularly in the southern region. These problems were clearly cited in all the five provinces of Regions I and II at the provincial workshops.

Deforestation in uplands and cultivation along river/stream banks, culminates in soil erosion and choking up of streams/rivers with silt and sediments. When there is an intensive storm, this results in flush flooding of these streams. For example, the Luangwa (formerly known as Feira) District, Lusitu area in Southern Province and Central Luangwa Valley area in Eastern Province are cases in point where these processes have been seen to occur (Kalyocha, 2000; Siamwiza, 1998; Kalyocha, 1988 and Larsen, *et al*, 1985).

These processes also make people who cultivate along the stream/river banks to lose their crops due to flooding and layering of the fields with sand/silt after a flood (Kalyocha, 1988; 2000).

There is a problem of drying-up of streams and rivers. This problem is due to a combination of low ground water recharges, soil erosion and drought (Kalyocha, 2000). In recent years, however, even seasonality has rapidly diminished for most of the streams/rivers. Water is only available just when the rain falls, but quickly runs off or dries up in a few days.

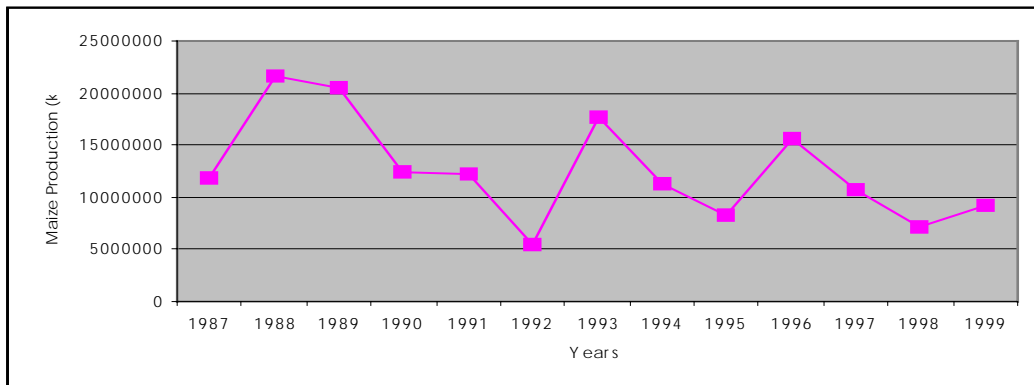
## 2.3 THE IMPLICATIONS OF THE DESERTIFICATION PROBLEM

### Some Consequences and Costs of Desertification

The impacts of desertification at a local scale are very negative. These cause low productivity of the land to support natural veld, livestock and crop. They in turn have social economic consequences.

Other environmental costs at a local scale that are directly or indirectly associated with land degradation are loss of shade, shelter and visual amenities. Any changes in the productivity of the land have consequences on agricultural production in Zambia and in turn on the social economic well being of the people. The increasing spates of drought occurrence and prevalence of land degradation problems have had dramatic impact on agricultural production, especially on small-scale farmers in the severely affected provinces (Agricultural Statistical Bulletin, Policy and Planning Division, MAFF, 1999/2000).

In Zambia, there has been a general decline in total cultivated hectareage from 1, 004, 300 in 1989/90 to 701, 500 hectares in 1997/98, a decline of over 30%. Furthermore, the average maize yield (the main staple food crop in Zambia) per hectare decreased from 1.48 tons in 1989/90 to 1.27 in 1997/98. The 1989/90 yield is three times less than the expected average yield.



**Figure 7: Maize Production (kg) from 1987 to 1999** (Agricultural Statistical Bulletin, Policy and Planning Division, MAFF, 1999/2000).

The poor performance of the agricultural sector has been attributed to the following drought related problems, which stand out as most significant:

- Reoccurring droughts in the 1990s have made farming rather unpredictable and risky
- High costs of inputs. With land degradation problems the need for farm inputs (fertilisers) becomes imperative. The 1990s have been characterised by the full implementation of the market policies, resulting in total removal of subsidies on all agricultural inputs. This has made many farmers unable to access agricultural inputs.
- Reduction in the number of work oxen has been mainly due to animal disease exacerbated by drought.

At global level, land degradation has implications on flood occurrence, ground water recharge systems due to high run-off rates and siltation/ sedimentation of rivers. The consequences of vegetation cover removal have implications on sinks for carbon dioxide and this can result into destabilisation of the climate particularly temperature regimes.

## **CHAPTER THREE: RELATIONSHIP BETWEEN NAP AND OTHER PROGRAMMES: AN ANALYSIS**

### **3.1 Analysis of multi-sectoral Environmental Programmes in relation to the NAP**

#### **NEAP and ESP**

The 1985 National Conservation Strategy that aimed at incorporating environmental management in the national development processes of the country was recognised to have a few inadequacies. These included the following:

- The economy was undergoing a period of liberalisation, and as such, there was need to review and integrate environmental concerns into the social and economic development process of the country, consistent with the country's new market economic orientation. These formed the main guiding objectives for the NEAP.
- Against the above, there was need to make provisions for new opportunities for involvement of local communities, the private sector, NGOs and CBOs in the management of the environment while at the same time recognising the important role for government in monitoring, regulation and enforcement of appropriate resource-use in the interest of sustainable development.

The other reason for the preparation of the NEAP was that the main recommendations of the NCS had been implemented, hence a re-orientated programme was a necessity.

The NEAP is a comprehensive document that was developed through the participatory analysis of the environmental situation and management, which resulted in the identification of key environmental issues facing Zambia. The five major environmental problems isolated in the NEAP are land degradation, deforestation, air pollution in the mining areas, water pollution and inadequate sanitation, and wildlife (game and fish) depletion. It reviewed the weaknesses in existing legislation and institutions and provided strategy options for improvement of environmental quality. The NEAP also provides updated environmental policy actions and forms the basis for the future development of an investment plan for its implementation. The need for supporting the public, the private sector and community based approaches in environmental and natural resources management was strongly recommended. This is consistent with the guiding principles of the Convention to Combat Desertification.

The areas of relevance to the Convention to Combat Desertification from the NEAP document include the following:

- Institutions and Environmental Legislation
- Economic Development and the Environment
- Agriculture
- Renewable Natural Resources
- Human Population
- Energy Resources
- Environmental Education, and

- Environmental Issues in the Provinces.

There are some areas which, do not feature prominently in the NEAP but are of great concern under the CCD. These include the strengthening of the early warning systems, utilisation and development of indigenous knowledge, transfer of appropriate technology to the community level and the area of information collection, management and exchange including the aspect of impact indicators. These gaps are very important areas of entry and support by the NAP.

The recommendations of the NEAP are being implemented through the Environmental Support Programme (ESP), an environmental investment fund, mainly supported by IDA (World Bank). The ESP is aimed at mainstreaming environmental and natural resources management in Zambia's development processes at both the national and local level, so as to tackle the root causes of environmental degradation. The ESP Phase I was initiated in 1998 and will run up to 2003, under the auspices of the MTENR. The major components covered by the programme are:

- Strengthening the Institutional, legal and regulatory framework. This includes implementation of the Community Environmental Management Programme (CEMP)
- Strengthening Environmental Education and Public Awareness
- Undertaking pilot activities to strengthen community-level environment and natural resources through provision of matching grants through Pilot Environmental Fund (PEF) for community initiatives and for environmental studies
- Building environmental information management systems
- Community Based Natural Resources Management Programme in Western Province.

As Zambia aims to reduce poverty from the current level of about 70% of the households to 50% by the year 2005, the above areas are pivotal to the sound environmental conservation which in turn are important elements in achieving a clean and healthy environment. Their achievements are, therefore, a necessary pre-condition to achieving sustainable development.

This is in line with provisions of the Agenda 21, which recommended that member states make provisions for their national development plans, programmes and policies to be in harmony with sustainable development goals.

The implications for NAP are that the NEAP/ESP already forms a foundation on which to build upon, as these programmes are consistent with the CCD. Therefore, the NAP needs only to add value to the strategies identified, putting emphasis on community-based approaches and increased participation of stakeholders.

## **National Biodiversity Strategy and Action Plan (NBSAP)**

Zambia is a party to the Convention on Biological Diversity (CBD) which it ratified on 28<sup>th</sup> May 1993. In trying to meet its obligations, the government in 1997, through the MTENR initiated the preparation of the NBSAP to provide a basis for the implementation of the CBD.

The NBSAP document was finalised and adopted by Government. The NBSAP reviewed and provided information on the following with regard to biodiversity conservation in Zambia:

- Current status of biodiversity
- Pressures and threats to biodiversity
- Institutional and legal frameworks

The above analysis provided a framework of strategies and actions to address the following areas:

- Conservation of biodiversity
- Sustainable use of biodiversity
- Equitable sharing, and
- Bio-safety

Arising from this strategy and action plan, several biodiversity programmes have emerged:

- Lake Tanganyika Biodiversity Project, formerly known as the Pollution Control and other measures to Protect Biodiversity in Lake Tanganyika under ECZ,
- The Integrated Dry Land Biodiversity Conservation Project in Semi-Arid Areas of Lower Zambezi-Luangwa Valley Region (ICBD),
- The Lukanga Swamps Biodiversity Conservation, and
- Reclassification and Sustainable Management of Zambia's Protected Areas System

The ICBD, Lukanga Swamps Biodiversity Conservation and Reclassification and Sustainable Management of Zambia's Protected Areas System are still in their preparatory stages.

The UNCCD has synergies with other global conventions (CBD, UNFCCC) and these programmes form part of the UNCCD initiatives and shall need to be supported in terms of completion of their preparation and implementation phases.

### **3.2 Analysis of other Environmental and Natural Resources Programmes in relation to the NAP**

Parallel to the developments above, the Government has been implementing processes aimed at reviewing various natural resources sectoral policies and legislation to give more explicit rights to stake-holders, communities and the private sector. These sectors include forestry, wildlife, water, energy and fisheries.

## **The Forestry Sector**

The status of the forestry resources has been deteriorating over the past years. Given the importance of the forestry sector to the economy and the environment, the Government initiated a process in 1993 to 1997 to prepare a 20 year Zambia Forest Action Plan (ZFAP) to address this problem. The main objective of ZFAP is to provide for the national management and conservation of forest resources in order to enhance the contribution of the forest sector to social economic development, poverty reduction and the improvement of food security. This process has led to the review of the Forest Policy of 1965 and Forest Act of 1973. The main essence for the review of the Policy and Act was to provide for a mechanism to enhance the participation of local communities and other stake-holders particularly private sector in the management of the forestry resources. The Government has since adopted the New Forest Policy of 1998.

The action programmes elaborated by ZFAP include the following:

- The Indigenous Forest Management and Biodiversity sub-programme
- The Tree and Forest Development sub-programme
- The Forestry Industry and Non-Wood Forest Products Development Sub-programme
- The Woodfuel Energy Development Sub-programme

The above sub-programmes are front-line activities with direct impact on the forest sector development objectives. They are complemented by the supportive sub-programmes and a series of forest sector policy actions and institutional strengthening activities, which promote sustainable forest resources management namely:

- The Forest Education and Training Sub-programme
- The Forest Research and Extension Sub-programme, and
- The Policy, Planning, Monitoring and Evaluation Sub-programme.

These will require to be reinforced by encouraging the Private Sector and NGOs to participate in sustainable forest management. The actions to strengthen these programmes need to be supported by the private sector incentives, to encourage investment in sound forest management.

The Forest Department in Luapula, Copperbelt, Southern and Central Provinces is undertaking the promotion of forest management involving indigenous systems as well as local district administration.

The Provincial Forestry Action Programme (PFAP), which is being funded by FINNIDA focuses on Joint Forest Management Systems (JFMs), a participatory methodology which is action oriented and promotes co-operation and the sustainable management culture. The client groups and stakeholders of PFAP include individuals and households dependent on forests, rural and urban communities, Private Sector enterprises, NGOs, CBOs, forestry industry, mining and politicians.

The project also undertakes vegetation mapping through ground surveys, aerial photography and use of remote sensing satellite imagery to determine the status and

trends in forest resources and the extent of their utilisation. The Forests Bill has been enacted and this will enable full implementation of the JFMs.

The ZFAP is, therefore, a very promising model in terms of its aims to contribute to sustainable economic development through its sub-programmes. However, support and investment in the sub-programmes is still required to meet the objectives of ZFAP. The UNCCD-NAP has an opportunity for complementing the ZFAP initiatives.

The ZFAP ultimate objectives and its programmes are indeed in line with those of the UNCCD, which focus on contributing to social economic development through sustainable economic growth and reducing poverty. The support of the UNCCD-NAP to the implementation of ZFAP will require an assessment of current investment gaps and support requirements in the forest sector to determine and optimise UNCCD-NAP's commitments. Since the PFAP initiative is operational only in four provinces of Zambia, two of which do not fall in the NAP priority areas, there is need through the NAP to extend the programme to the other provinces, especially the ones severely degraded in Regions I and II.

### **Wildlife Sector**

The wildlife resource despite its importance and potential in contributing to social economic development and biological functioning of ecosystems has been depleting over the years due to poorly financed and poor management systems supported by weak legislation. These threats necessitated the Zambian Government to review its management systems as early as the 1980s. This review resulted in the assertion that the problem of the wildlife resource decline was largely due to social economic factors, which had not been considered in the conventional management designs. This called for an integrated approach to wildlife management including community participation in decision making, revenue sharing and resources management through the Village Wildlife Scout Programme. This saw the implementation of the Administrative Management Design (ADMAD) and the South Luangwa Area Management Unit (SLAMU), as community-based wildlife management approaches. The ADMAD programme differs from LIRD in terms of revenue sharing mechanisms (systems) between the community and the Government integrated nature of the programmes, the community structures that have been put in place and the operational areas.

Although the concepts are highly innovative and could contribute significantly to wildlife conservation, the successes of these programmes have been limited and mixed, due to various reasons including inadequate legal backing to support community participation (Kalyocha, 2000). However, the Government in 1998 formulated the Wildlife Policy and reviewed the principal Wildlife Act of 1991. The Policy and the revised Act of 1998 provides for the formation of ZAWA which was charged with the following responsibilities:

- Conservation and management of wildlife resources and their ecosystems in national parks, game management areas and outside national parks, to ensure ecological integrity,



- Promotion of Community Participation through establishment of Community Resource Boards to support the above,
- Preparation of Management Plans to guide management of wildlife resources and their sustainable use, and
- Support to the Tourism Industry through creation of an enabling environment for the Private Sector.

In this light, UNCCD-NAP has the basis for intervention in ZAWA to support biodiversity management in the areas of institutional capacity building and community participation.

As wildlife can contribute to economic development through tourism, ranching and safari-hunting, efforts to support these industries, for example, infrastructure development and support to conservation efforts including those emphasising private entrepreneurship, like ranching need to be strengthened. The support should be directed at ecologically marginal areas for agriculture but suited to wildlife management, particularly in the five provinces of Regions I and II.

### **Water Programmes**

The government in 1993, developed a water policy to guide developments in the management, demand and supply of water as an important resource in the country. This is in line with the changing macro-economic environment as well as to address an inherent weak institutional capacity, which is unable to prevent deterioration of facilities and service delivery. In addition, the Government in 1995 prepared the National Water Resources Management Plan and the Water Resources Action Programme in the year 2000. Sustainable water resources management is an integral requirement for the Convention and is certainly a NAP activity, especially in implementing the recent Water Resources Action Programme. It is important to identify and assess programmes to be supported by the NAP. Such programmes can include facilitation of community management of water supply points, capacity building in the Department in feasibility studies and construction of irrigation facilities, resource mobilisation and allocation for construction of water facilities, training, promoting sustainable water harvesting techniques and many others.

Current on-going water development projects that need to be consolidated in terms of implementation through NAP include:

- Groundwater development (Northern Province)
- Ground water development (Central, Copperbelt and Lusaka Provinces)
- Rural water for Health (North-western)
- Groundwater development (Eastern)
- Groundwater Development (Southern)
- Rehabilitation and Construction of Dams
- Rural Water Development
- Water Resources Assessment

Constraints hindering successful implementation of the above projects, particularly the GRZ supported projects include: inadequate capital allocation; late releases of capital funds; inadequate developed human resources due to brain drain, inadequate transport and equipment and community participation projects which are slow in implementation. These are clear and obvious areas for intervention and support by the NAP.

### **Fisheries programmes**

The Fisheries Industry does contribute to desertification along riverbanks or lake shores because firewood is used for drying fish. Cutting trees for firewood leads to deforestation. Deforestation can lead to soil erosion, biodiversity loss, land degradation, soil infertility, siltation and flooding along riverbanks and lakeshores.

To address this concern the Government has prepared programmes on fish conservation. These programmes provide a basis for NAP intervention, especially in the areas of finding alternative methods of drying fish and having fish as alternative livelihood for rural communities living in land degraded areas

## **3.3. Analysis of Programmes promoting Sustainable Development in relation to the NAP**

### **ZAMSIF and PRSP**

The Zambia Social Investment Fund (ZAMSIF) formerly, Social Sector Rehabilitation Programme (SSRP) is a programme under the Ministry of Finance and National Planning and is supported by the EU and World Bank. It aims to promote social development and reduce poverty through increased GRZ financing to the social sector. ZAMSIF has sub-programmes, Micro Projects Programme (MPP), the Social Recovery Project (SRP) and Social Safety Net (SSN). MPP supports projects that are proposed and implemented by the local people, including administration of funds. The SRP supports community initiatives to help protect the poor during the SAPs. The projects under this programme include health, nutrition, education and economic infrastructure. However, in both the MPP and SRP communities contribute labour, material or cash, as a way of sustaining the projects.

The Social Safety Net (SSN) provides cushion from the impacts of SAP on vulnerable groups. This is done by providing material support for self-help projects and financial and skills training to the poor.

The role of UNCCD-NAP in ZAMSIF shall be to encourage Debt-Swaps and ensure that debt-relief-savings are invested in the economic and social sectors. In recognition of the fact that these programmes did not put emphasis on environmental and natural resources management, the ESP established the PEF under MPP to integrate environmental concerns in community development. The PEF is aimed at facilitating community participation in small-scale environmental studies and micro-projects. There is strong need, therefore, for close collaboration on issues dealing with land degradation.

The Zambian Government has worked on the Poverty Reduction Strategy Paper (PRSP) that elaborates and provides additional programmes to the existing efforts directed at poverty reduction. The paper was prepared through analysis of current developmental issues and efforts in the sectors of Agriculture, Mining, Industry, Tourism, Health, Education, Water, Sanitation, Environment, Housing and Resettlement. The PRSP has proposed action areas and strategies to reduce poverty and support income-generating activities.

### **The Agricultural Sector Investment Programme (ASIP),**

ASIP I was originally designed to rationalise donor support to the Ministry of Agriculture and Co-operatives in order to create an enabling environment to support agricultural development in 1992. The programme only started in 1996 and was financed as follows: 60% from multilateral and bilateral partners and 40% from Government.

The ASIP I development goals were:

- Food security at both household and national level;
- Sustainability of the existing agricultural resources (land, water, and air);
- Generation of incomes through employment creation;
- Contribution to the Country's sustainable industrial base;
- Contribution to the country's balance of payment support through agricultural exports.

The above goals were to be realised through the following broad-based strategies:

- Diversification of crop production and promotion of drought tolerant crop species (millet, sorghum and cassava) in drought prone areas;
- Efficient delivery of services to small scale holders;
- Expanded opportunities for outlying areas;
- Improvement in the economic status of women;
- Improved use of available water resources; and
- Emphasis on sustainable agriculture.

Sustainable agriculture, among other things is to be achieved through some of the above stated strategies, which promote production of both cereal and leguminous crops on a rotational basis and improved water management. Other measures embedded in sustainable agriculture are reduction of soil erosion through appropriate farming practices such as contour ploughing and minimising adverse effects of changing technologies on the environment.

Most of the works on sustainable agriculture are being implemented through the Land Management and Conservation Farming Project (LM&CF) supported by SIDA. The project has been in operation in some of the areas of Regions I and II since the 1980s. Its main objective is to promote improved and sustainable agricultural productivity through technologies that emphasise good management of the organic matter of the soil and rainwater. The main activities of the LM&CF Programme carried out with a gender perspective include training, promotion of physical and biological soil conservation

structures, soil fertility, rain water management, farm forestry, range and pasture management.

At the moment, MACO is working on Agricultural Commercialisation Programme (ACP), as a successor to ASIP. The NAP can contribute to agricultural development through support to the strategies, which are aimed at achieving food security, land resources conservation, economic development and poverty reduction.

### **The National Population Policy**

The National Population Policy was adopted in 1989. This Policy recognises the need to integrate population issues into development planning. To translate this into an action oriented tool, government prepared a National Population and Development Programme of Action (1996-2015). This document further reviewed the Population Policy in the light of current social economic conditions (MoFED, 1996). The National Population and Development Programme has a strong relevance to the implementation of the CCD, in that reduced population growth will entail reduced dependence on natural resources such as woodfuel and reduced expansion of settlements and cultivated areas, which increase the problem of deforestation. The NAP should, therefore, support the implementation of the Population Policy in order to reduce the impact of human population and its activities on the quality and availability of land resources, thereby improving the quality of human life.

### **The Energy Policy**

Zambia's energy policy aims at investigating and developing other forms of energy using appropriate technology which is environmentally friendly. Currently, the Department of Energy is implementing a project in the Eastern Province on the use of solar energy for lighting. The University of Zambia through the Technology and Development Unit and the National Institute for Scientific and Industrial Research in collaboration with the Institute of Social and Economic Research has been working on developing these technologies.

Similar programmes under the rural electrification project and works by NGOs and other supporting agencies such as YWCA, Africare, GTZ in the promotion of heat serving stoves, biogas, coal briquette braziers and low cost sources of lighting have been encouraged under the Energy Policy. This is a very good avenue for NAP intervention.

### **Gender Policy**

It has been noticed that segregation and imbalances exist in the Zambian society between various social groups, in particular men and women. The Zambian Policy on Gender focuses on reducing the gap, by emphasising the involvement of women in all development aspects and promoting the welfare of women as well as other disadvantaged groups particularly the girl child. This is in line with the requirements of the NAP, which places emphasis on gender considerations in all programmes.

#### 3.4. **Other on going programmes in relation to the NAP**

In addition to the above initiatives, government has continued to implement and support other on-going programmes that improve the quality of life in Zambia. These include the **Road Sector Investment Programme**, the **Education Sector Integrated Programme**, **Health Sector Reform Programme** and the **Public Sector Reform Programme**. The common feature of all these programmes is the increased recognition of decentralization of power to lower levels, paying particular attention to capacity building, provision of infrastructure and equipment, logistics and adequate funding. Limited capacity by government to support the implementation of the reforms has resulted in the failure to achieve the intended objectives and support to institutions and promote social welfare. In view of this, attention could be paid to some NGO led programmes with objectives on desertification.

In line with the Convention, the NAP should elaborate and implement sustainable income generating activities to improve livelihood and reduce poverty, which is one of the root causes of land degradation.

## **CHAPTER FOUR: PROGRAMME AREAS**

### **4.1 Programme Vision**

To restore land productivity by using sustainable means of conserving it in order to reduce poverty and foster sustainable development.

### **4.2 Programme Purpose**

The purpose of NAP is to identify the factors contributing to desertification and put in place practical measures necessary to combat desertification and mitigate the effects of drought.

### **4.3 Programme Objectives**

The NAP aims at contributing to sustainable environmental management through the reduction/control of land degradation, thereby contributing to Poverty Reduction, Food self-sufficiency and Food Security and ultimately contributing to Economic Growth. Its immediate objectives are:

- Reduce the destruction of land resources in affected areas
- Promote sustainable use of land resources
- Increase public awareness and information dissemination on matters of land degradation
- Provide a suitable policy and legislative framework for the implementation of NAP
- Establish and support effective administrative and co-ordination of the NAP
- Introduce and improve on assessments, planning and monitoring systems for the effective management of NAP, and
- Establish partnerships with multi-lateral and bilateral institutions in the management of arid areas.

### **4.4 Identified Programme Areas of Intervention**

To achieve the stated objectives, the following programme areas have been proposed according to their priority:

- Early Warning and Preparedness
- Forestry, Ecosystems and Species Conservation
- Water Catchment and Energy Conservation
- Collaboration and Networking
- Capacity Building of Programme Co-ordination Unit and Other Focal Persons
- Extension, Public Awareness, and Information Dissemination
- Land Degradation Assessments, Monitoring and Reporting
- Easy to use environmentally friendly technologies including Indigenous Knowledge
- Livelihood Improvement
- Food Self Sufficiency and Food Security
- Human Settlement Management, and
- Legal and Policy Reviews

## **Early Warning and Preparedness**

Zambia produces crop weather bulletins every ten (10) days during the rainy season. Crop forecasts are issued by the National Early Warning Systems (NEWS). The problem of few reliable weather stations, limited network of rain gauges and communication radios affects the accuracy and quality of data. However, satellite information is used to complement these efforts.

The methods of crop forecasts have severe limitations in terms of producing reliable data. Current methods do not take cognisance of inter-crops in individual farmers' fields. There are problems of estimating planted areas and yields for crops grown. There are errors in estimates, which affect the results of the information produced on crop forecasting (The *Zambian Farmer*, Vol. 4, No. 4, September, 2000).

Apart from the above deficiencies, the response capacity in Zambia on the part of Government is limited due to inadequate financial resources (Mtolo, pers, commun).

Given this situation, the strengthening of the early warning and preparedness systems, which is also emphasised in the CCD, shall be achieved through the following interventions:

- Assess the current early warning and preparedness systems,
- Improve the early warning and response capacities,
- Evaluate current strategies and methodologies (for example Vulnerability Assessment Mapping) for assessing the impacts of climate variability on natural resources and humans in terms of easy-to-use, accurate information collected and quick production of results,
- Utilise predictions of climatic variability in an effort to mitigate the effects of drought by ensuring that information reaches decision makers, planners and affected populations in good time,
- Develop sustainable and appropriate programmes for both crops and livestock, and
- Support national centres/ institutions by providing them with adequate financial resources, better equipment for the enhancement of procurement, processing and dissemination of information about natural disasters, such as drought and floods.

## **Forestry, Ecosystems and Species Conservation**

There should be a deliberate effort to protect and manage existing forests and conserve sensitive ecosystems. The following are the suggested interventions:

- Promote and support a programme of afforestation, community plantations and agroforestry,
- Direct work of extension on organising and training communities in preparing and maintaining community owned nurseries and fodder banks for supplying planting materials, managing wood lots, and in sustainable utilisation of these resources,
- Promote awareness creation and train communities to draft and implement by-laws in order to sensitise communities to reduce indiscriminate cutting of trees,

- Introduce and implement an incentive scheme to encourage communities to plant and replant trees within their vicinities,
- Emphasise on selection and proliferation of appropriate indigenous drought tolerant species especially leguminous species and promotion of indigenous technologies,
- Determine the current status of forests and deforestation by land-cover maps, use of remote sensing techniques and ground surveys in order to manage the forests properly,
- Review the list of species being affected as a result of deforestation and land degradation, and
- Revise legislation on endangered species accordingly to provide for their protection.

### **Water Catchment and Energy Conservation**

To effectively manage the catchment areas, the following programme interventions are proposed:

- Promote preparation and implementation of community catchment plans on public and customary forestlands on a sustainable use basis,
- Promote techniques for the development of surface and ground water for humans, agriculture and livestock,
- Encourage rain water harvesting including damming for interception of seasonal streams, grass strips and crop mulching,
- Promote small scale irrigation schemes as well as adoption of appropriate irrigation methods,
- Promote increased tree planting in degraded areas,
- Promote reduced use of wood fuel through the use of fuel-efficient stoves for wood and charcoal using models that are culturally adaptable, and
- Develop and promote low-cost alternative sources of energy (non-wood fuels), for example
  - briquetting of agricultural residuals and coal,
  - solar drying for preserving perishable foods, vegetables and fish,
  - solar water distillation technologies for water supply,
  - wind pumps for water supply and irrigation,
  - wind turbines for grain milling,
  - biomass gasifiers and biogas digesters,
  - promotion of rural electrification, and
  - production of non- edible and edible seed oils as diesel fuel extenders and substitutes in remote rural areas with suitable ecologies.
- Promote photo-voltaic electricity applications for:
  - rural health centres
  - water supply and irrigation
  - cottage industries
- Promote awareness among the local population through massive campaigns about the value of the water catchments and trees in particular.



## **Collaboration and Networking**

There is need to forge and strengthen regional linkages and collaboration on matters of land degradation through promotion of exchange of research data, training, public awareness and early warning. Collaboration could also be enhanced with such regional institutions:

- The Regional Early Warning System based in Harare for SADC,
- The Eastern and Southern Africa Early Warning System based in Nairobi,
- The SADC- Environment and Land Management Sector based in Lesotho, and
- The Kalahari-Namib Programme with headquarters in Gobabob, Namibia.

Collaboration should be enforced through training programmes, exchange visits, workshops and meetings.

## **Capacity Building of the Programme Co-ordinating Unit and Other Focal Persons**

The success of the proposed programmes shall depend on the capacity of government and other stakeholders including the local population to manage the programmes. This shall require adequate training of the personnel. The Programme interventions include the following:

- Carryout an overall needs assessment of the various stakeholders' requirements as a prerequisite to supporting the various institutions. Although the capacities of NGOs and CBOs have been assessed, some of the training programmes that need to be advanced to the grassroots, in particular, should cover the following areas:
  - Provide adequate training to personnel and communities, in technical and administrative skills, as well as, handling equipment and managing logistics,
  - Environmental management for development,
  - Integrated natural resources management,
  - Development and leadership skills including those of women,
  - Planning, management and co-ordination, and
  - Training of trainers in project management and communication skills.

## **Extension, Public Awareness and Information Dissemination**

Availability and timely provision of information is vital in the decision making process at any level. The following interventions are proposed in the area of extension, public awareness and information dissemination:

- Formulate an effective outreach programme through extension, public awareness and information dissemination mechanisms.
- Conduct massive campaigns to educate the people on the problems of desertification and general natural resources management in the affected areas. This could be done through mass media, distribution of pamphlets and booklets, newsletters, exhibitions and popular public theatres and drama.

- Arrange and support exchange visits for farmers' groups, extension and project management staff to visit other similar programmes in the country and/or in the sub-region.
- Undertake skills training for farmers and extension workers to enhance sustainable natural resource utilisation and income generating activities such as training in pit-sawing and carpentry, bee-keeping and honey processing, and other various resources-use activities that need to be highly supported to enhance self-employment opportunities.

### **Land Degradation Assessments, Monitoring and Reporting**

The assessment and monitoring of desertification should include:

- Provision of bench marks for assessing land degradation,
- Assessing the extent and status of land degradation,
- Ensuring that environmental impact assessments for all major proposed interventions are conducted,
- Putting in place monitoring and reporting mechanisms, particularly through monthly, quarterly, and annual reporting on desertification.
- Putting in place mechanisms for annual, mid-term and end of phase reviews.
- Promoting the participation of all stake-holders in land degradation assessments, monitoring and reporting

### **Easy-to-use Environmental Friendly Technologies including Indigenous Knowledge**

Interventions under this programme area shall include:

- Undertake an inventory to take stock of existing knowledge and technologies
- Use identified indigenous knowledge systems in combating land degradation and mitigating the effects of drought
- Emphasise on increased awareness and incentive scheme support to increase farmers' adoption rates
- Promote technological transfer through conventional management and conservation technologies. The technologies being promoted by LM&CF include contour ridging, vetivar grass strips, use of green manure, improved fallow, rain water harvesting, deep rip ploughing, farm forestry, intensification, are aspects in the right direction, and
- Use of traditional rulers and their administrative structures to spread knowledge and energy conservation practices.

### **Livelihood Improvement**

The programme interventions suggested to improve livelihood are Agricultural Development (crops and livestock), irrigation development, infrastructure development (road, irrigation, marketing centres) and Community Management of Game, Forests and Fisheries.

## **Game Management**

Under Game Management, the interventions proposed are:

- Empowerment of the local communities to manage the game resources. Currently, the majority of local communities do not feel adequately involved in the management of their wildlife. This attitude needs to be reversed.
- Promotion of income generating schemes for the communities and the private sector, for example, ranching, culling schemes, safari hunting, and tourism through provision of incentives.
- Sustainable land use.
- Capacity building of local communities on various aspects of wildlife management.
- Review and strengthen the village scouts programme under ADMADE.
- Introduce informer networks, involving local communities, headmen and chiefs.
- These should be complimented by systems of bonuses or incentives to support law-enforcement.

## **Promote Development of Economic Infrastructure**

The following interventions are suggested under the development of economic infrastructure:

- Improve feeder roads. The improvements would include grading, making side drains, and putting gravel in all agricultural strategic roads. Such activities need to be community based where manual labour ought to be employed. The use of manual labour would create employment opportunities to the local people.
- Identify and develop areas with already high concentrations of human settlements as development centres, and
- Provide market facilities in these places together with other social services.

## **Food Self Sufficiency and Food Security**

Current agricultural practices are inadequate to realise good productivity. Furthermore, some of them result into land-use conflicts and land degradation. To achieve food security, a number of agricultural interventions need to be implemented and supported. The following interventions are proposed:

- Promotion of soil fertility and conservation measures. Such measures should emphasise on biological and physical ones rather than chemical ones.
- Enhancement of crop diversification.
- Effecting a seed multiplication programme in the target areas.
- Strengthening of the existing agricultural extension services and mobilisation of local farmers into cohesive farmers groups.
- Improving overall farm management. The introduction of alternative sources of draught power such as donkeys need to be stimulated and propagated. Donkeys are better than oxen because of their resistance to trypanosomosis, especially in the valley areas.

- Enhancing agricultural production through promotion of small-scale irrigation schemes which will entail the following:
  - Feasibility studies for dam construction
  - Rehabilitation of weirs and canals
  - Training of farmers in maintenance of the dams and weirs
  - Training of farmers on basic maintenance and management of fish ponds through exchange visits and mobile courses
- Boost overall agricultural development through development and promotion of drought tolerant crop varieties for both local consumption and marketing, including:
  - promotion of women activities,
  - use of appropriate fertilisers, and
  - development of pricing mechanisms of agricultural commodities, as well as, market conditions.
- Promote improved Livestock Production:
  - Creation of pastoral network through grassroot organisations for the exchange of experiences,
  - Provision of subsidies to pastoralists,
  - Promotion of diversification of resource-base,
  - Development and maintenance of water points as well as spacing of boreholes,
  - Re-seeding of rangelands for forage and pasture development,
  - Provision of veterinary services,
  - Rotational grazing on rangelands, and
  - Fire control and management of rangelands to improve the quality of pasture.

### **Human Settlement Management**

The following programme interventions are proposed:

- Prepare and implement general-purpose regional land-use and development plans. These shall require assessment and provision of information on resource potentials, land capabilities, conservation and development needs which should result into land zonations thus categorising the land according to its potentials and limitations.
- Within the broad land zonations and for development to be sustainable programmes will promote land management and conservation practices together with human livelihood programmes,
- Develop land-use plans together with the local populations and local leadership in a participatory manner to ensure their implementation,
- Promote and provide family planning programmes and control human population increase in certain areas identified that are marginally suited for settlement and agriculture. Under this intervention, efforts should be made to identify development zones where people need to be attracted through development services, for example, feeder roads to facilitate agricultural production and marketing, provision and improvement of community social services, such as schools, clinics and many others

## Legal and Policy Reviews

The following policy and legislative intervention measures are suggested:

- Formulate a policy on measures to combat desertification and mitigate the effects of drought,
- Formulate a coherent and consolidated policy on environmental matters,
- Formulate subsidiary legislation to allow/permit all sectors to operate as one inter-sectoral organ, at the district level. These structures should be replicated at lower levels, for example, chiefdom and village levels,
- Revise principal Acts to facilitate raising levels of penalties through subsidiary legislation for offences regarding resource-use. The present penalties are too low to deter illegal exploitation of the resource-use,
- Revise principal Acts to enable communities manage their natural resources through community committees. The Acts should allow communities to police their by laws by using community scouts. The community committees should work in collaboration with the District Councils Natural Resources Committees.
- Review the land tenure system to rationalise and encourage proprietorship/ ownership and user-rights to promote sustainable utilisation of resources, and
- Revise principal Acts to enable local communities to benefit from the management of their natural resources.

## 4.5 Logical Framework and the Action Plan

For the NAP to have a meaningful impact, adequate time and resources are required for its implementation. A period of 5 years is proposed to implement the NAP beginning in 2003. However, possibilities of extension depending on performance should also be taken into consideration.

To logically measure the impact of the NAP over this proposed period, an action plan is outlined and is based on the Logical Framework Approach (LFA). The approach shows, in matrix tables, the vision, objectives/ outputs, interventions/ activities, performance indicators, means of verification, assumptions, key players and time frame, as illustrated in Appendix III. The resources required to implement the NAP are estimated for the entire programme implementation period to be US\$26,640,000.00 as illustrated in **Table 4** below.

It has been assumed that all the twelve identified programme areas of Interventions in the NAP will require to be funded under the Project Activities proposed in the Table below. However, this outline is only a programme preparatory framework that needs to be improved upon and detailed through elaboration of programme implementation documents, implementation schedules and annual work plans.

However, the plan presented is a useful guide for checking progress during the implementation phase of the NAP. This could be done through examining the various parameters in the matrices, for instance, progress made on implementing the various activities, constraints faced, responsible persons / institutions and measures taken to achieve the objectives of the various programmes.

**Table 4: Budget Estimates for NAP Implementation**

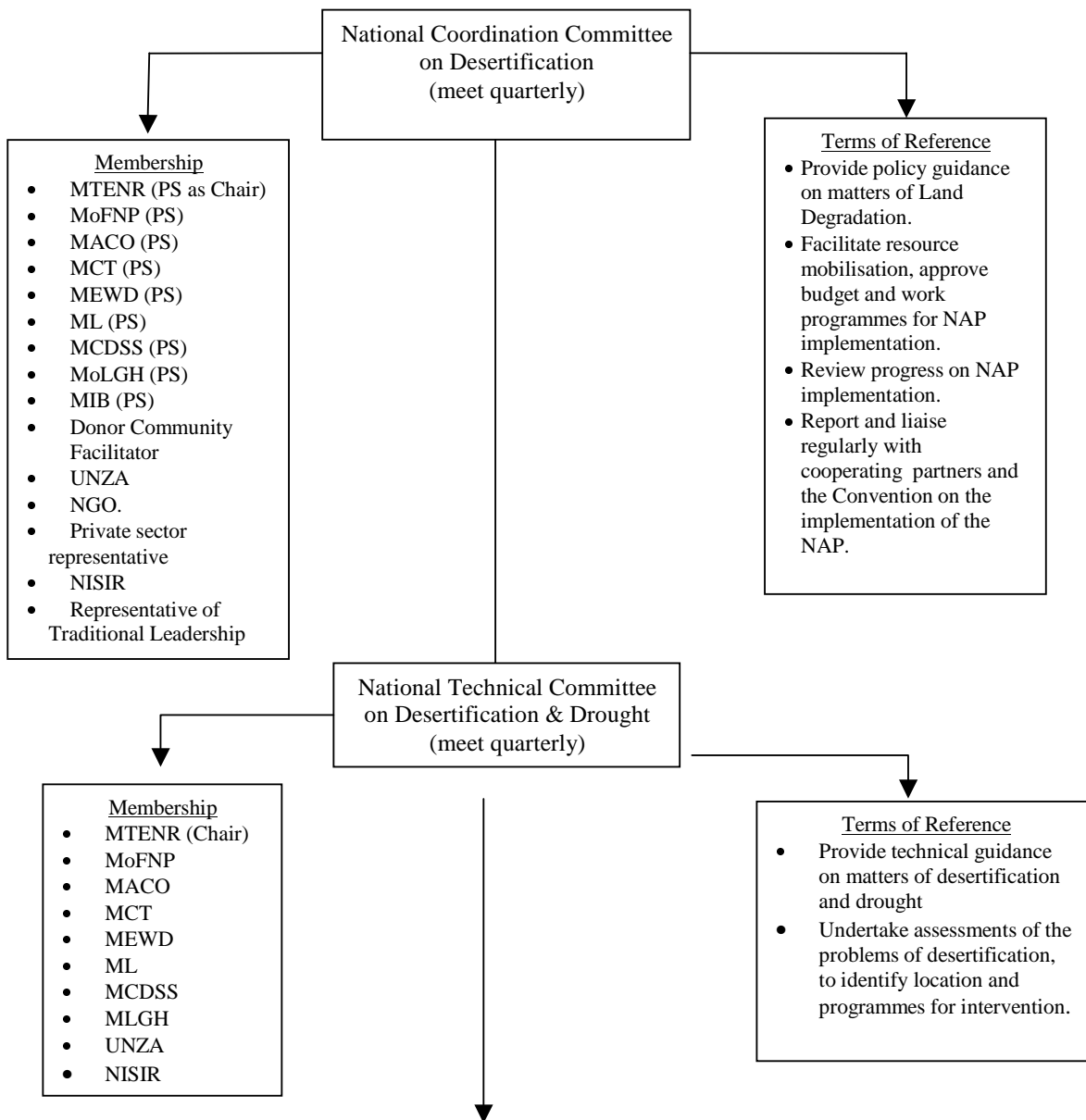
Project Activities	(Funds in US\$)					Totals	% of Total
	1	2	3	4	5		
Project Technical Support (Micro-Projects)	500,000	600,000	600,000	800,000	900,000	3,400,000	13.0
Training/Education Awareness creation	200,000	250,000	300,000	400,000	500,000	1,950,000	7.3
Workshops and Seminars	200,000	300,000	350,000	400,000	500,000	1,750,000	7.0
Women's special Project support	150,000	200,000	280,000	340,000	370,000	1,340,000	5.0
National Project Co-ordination and Management	300,000	350,000	400,000	400,000	400,000	1,850,000	8.0
Publications, Reviews, Studies/ Consultancies	-	1,000,000	1,200,000	2,000,000	3,000,000	7,200,000	27.0
Infrastructural Development support	100,000	500,000	1,500,000	2,000,000	3,500,000	5,500,000	21.0
Institutional Development support	200,000	400,000	400,000	100,000	100,000	1,200,000	5.5
Equipment							
<b>TOTAL</b>	<b>1,800,000</b>	<b>3,900,000</b>	<b>5,380,000</b>	<b>6,790,000</b>	<b>8,770,000</b>	<b>26,640,000</b>	<b>100</b>

## CHAPTER FIVE: IMPLEMENTATION AND CO-ORDINATION ARRANGEMENTS

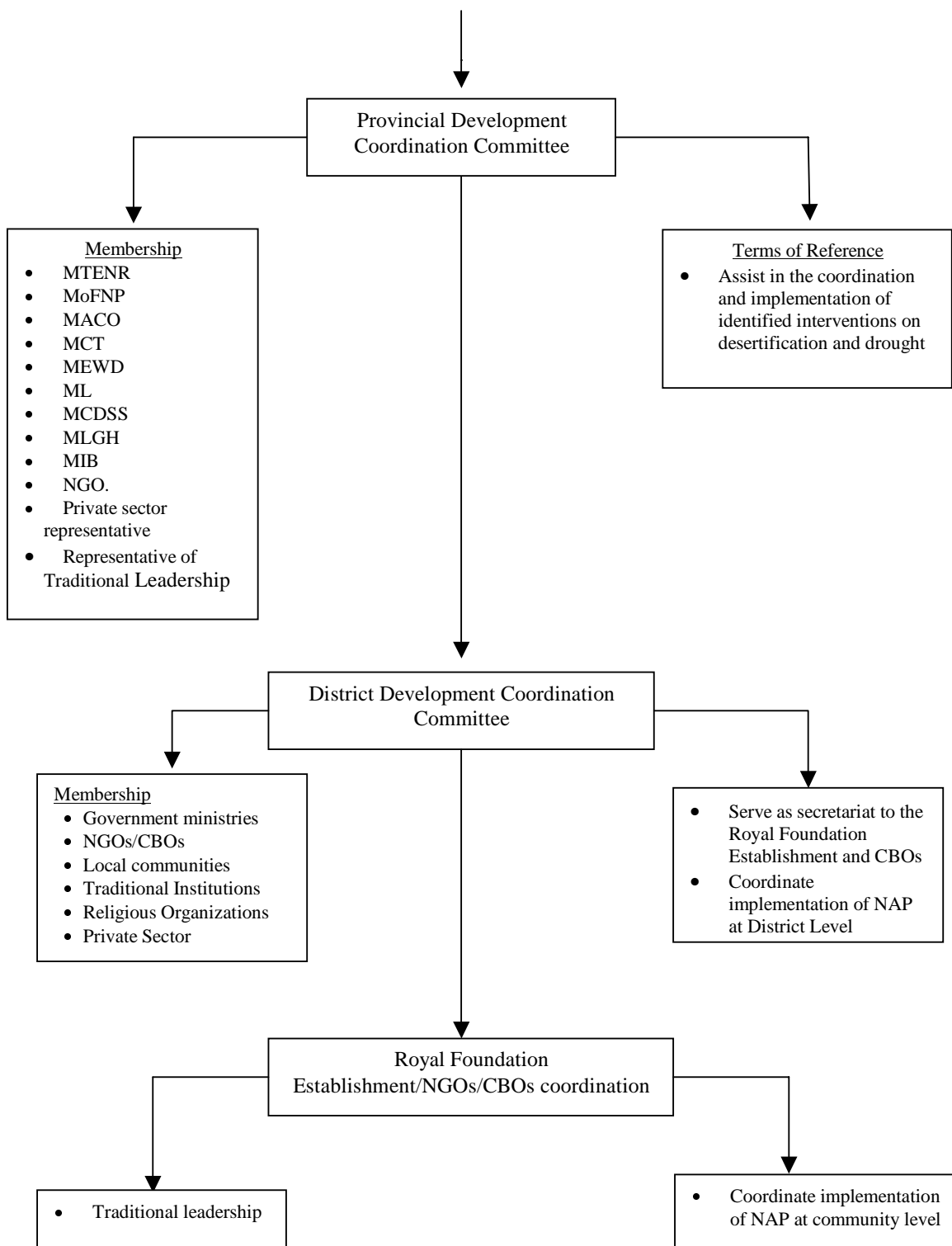
### 5.1 Institutional Flow Chart

There is need to put in place an effective institutional mechanism that will oversee and supervise the operations of the NAP. In Zambia, the institutional arrangement on the implementation of the NAP is shown below:

**Figure 8: Institutional Flow Chart**







### **The National Co-ordination Committee on Desertification and Drought (NCCD)**

The National Co-ordination Committee on Desertification and Drought (NCCD), shall be a sub-committee of the already existing National Committee on Environment. This committee shall be co-ordinated by the MTENR being the supreme body on environmental issues in Zambia.

The present National Steering Committee comprising 21 members is too large for a meaningful and effective way of resolving issues. The NCCD should be composed of fifteen (15) permanent members as clearly outlined in the Flow Chart. To give it legal powers and backing, the NCCD should be established by subsidiary legislation.

### **National Technical Committee on Desertification and Drought (NTCDD)**

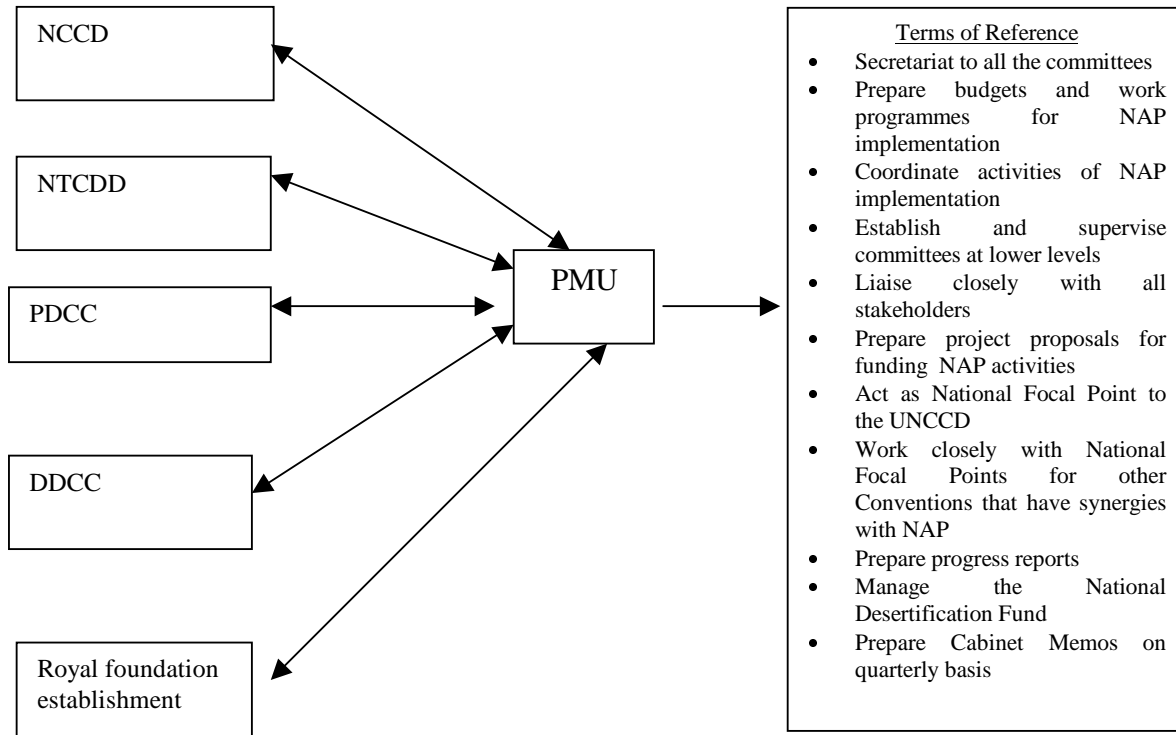
The National Technical Committee shall comprise of 11 members and will be coordinated by MTENR. This committee shall give technical guidance to NCCD. The Terms of Reference of this Committee have been outlined in the Flow Chart.

### **The Programme Management Unit (PMU)**

To service the various committees, co-ordinate their operations and oversee the overall implementation of NAP, a separate Programme Management Unit (PMU) is proposed to be established within the MTENR. It is proposed that a Programme Coordinator of the NAP be appointed, employed or seconded. The Co-ordinator shall need to be supported by a small number of administrative and professional staff.

This means that the current National Focal Point (NFP) in the MTENR needs to be expanded and strengthened to ensure that these functions are carried out. Depending on need, these may be supported by short-term technical assistance. To manage and co-ordinate the programmes at lower levels, the PMU, need to strengthen and work through the Provincial and District Development Co-ordination Committees and their sub-committees on environment and natural resources, emphasising on desertification matters. It is noted that through the DMMU, such sub-committees do already exist. The Programme Co-ordinator of NAP should, work closely therefore with DMMU, assess synergies and work out areas for collaboration that need support to foster anti-desertification and drought mitigation programmes. Appointment of NAP co-ordinators at these levels is imperative, in order to facilitate local level projects identification, formulation and implementation. The PMU will be the key NAP co-ordinating agency in Zambia.

**Figure 9: Flow Chart of the Relationship between PMU and other Committees**



### **PDCC, DDCC and Royal Foundation Establishment**

The PDCC, DDCC and Royal Foundation Establishment shall work in collaboration when implementing the NAP at provincial, district and community levels.

### **National Stakeholders Participation**

Each of the identified stakeholder groups has specific roles to play in the NAP process as described by Mweene (1998) in Table 5 below.

Although there could be some overlaps in the potential roles that the stakeholders may play, the NAP should endeavour to allocate each group with the role in which they have a comparative advantage. In order for the Action Plan to be implemented successfully, it is important that the NAP process take into consideration issues of strengthening the capacity of the identified stakeholders according to their specific needs. An overall needs assessment need to be undertaken in this area for purposes of NAP intervention.

**Table 5: Identified Stakeholder Groups and their roles in the NAP process**

NAME OF STAKEHOLDER	DESCRIPTION	POSSIBLE ROLE
Internal stakeholders Local communities	Small-scale or commercial stakeholders living in the affected areas	<ul style="list-style-type: none"> <li>• Useful in problem diagnosis</li> <li>• Provision of solutions to the problems</li> <li>• Vast experience in indigenous technologies</li> <li>• Implementers of projects/programmes</li> </ul>
Government	This includes the various ministries and departments of the Government	<ul style="list-style-type: none"> <li>• Coordinator of NAP</li> <li>• Assigns responsibilities to stakeholders</li> <li>• Provides enabling environment</li> <li>• Ensures the obligations under CCD are met</li> <li>• Financial mobilisation</li> <li>• Local people and donor mobilisation</li> <li>• Monitoring and evaluation</li> </ul>
Local Authorities	Both Rural and Urban districts are included	<ul style="list-style-type: none"> <li>• By-law formulation</li> <li>• Oversee NAP implementation at district level</li> <li>• Coordinate development issues at district level</li> </ul>
NGOs/CBOs	Locally and internationally based NGOs and CBOs involved in environmental, developmental and other social activities in Zambia	<ul style="list-style-type: none"> <li>• Promote popular participation</li> <li>• Complement government efforts</li> <li>• Mobilise financial resources</li> <li>• Capacity building</li> <li>• Awareness raising</li> <li>• Project implementation</li> <li>• Monitoring and evaluation</li> </ul>
Academia	Includes research institutions, technical colleges and universities	<ul style="list-style-type: none"> <li>• Research</li> <li>• Training</li> <li>• Technology development</li> </ul>
Private Sector	The business and industry community	<ul style="list-style-type: none"> <li>• Employment creation</li> <li>• Financing NAP activities</li> <li>• Technology Development</li> <li>• Financing Research</li> </ul>
Media	Print and Electronic	<ul style="list-style-type: none"> <li>• Education</li> <li>• Awareness raising</li> </ul>
Traditional institutions	Chiefs and Headmen	<ul style="list-style-type: none"> <li>• Oversee the NAP implementation at community level</li> <li>• Awareness raising</li> </ul>
Religious organisation	The churches	<ul style="list-style-type: none"> <li>• Awareness raising</li> <li>• Community mobilisation</li> </ul>
External stakeholders Donors/international organisations	AID organisations and the donor community	<ul style="list-style-type: none"> <li>• Provide financial resources</li> <li>• Provide technical assistance</li> <li>• Mobilise resources</li> </ul>

It must, however, be recognised that there are potential areas of conflict among the stakeholders, which should be guarded against in the NAP. These areas include those on

policies, fiscal resources management, different agendas, relationships, co-ordination and perception of issues.

The allocation of roles to stakeholders could perhaps address this potential problem, and this probably will foster ownership of the NAP by all stakeholders and ensure its successful implementation. The targeting of awareness and consultative programmes on the identified NAP may help resolve this problem.

The media, in particular, is important for this purpose and should be utilised effectively to create awareness and disseminate all information on the NAP process and implementation of the Convention.

### **NGOs / CBOs CO-ORDINATION**

While the importance of the roles of NGOs and CBOs as major stakeholders is well covered above, this section elaborates on the co-ordination process of the NGOs that is required for the implementation of NAP. An inventory of NGOs and CBOs (ZAW, 1998) showed that there were over 120 of such organisations operating in Zambia (Ibid). Although the list of these organisations could have been exhaustive at the time, there is need for on-going and continuous updating of the list considering that there are new NGOs being formed all the time.

Despite this long list and some of the NGOs having participated in various CCD awareness workshops, the co-ordination framework with regard to issues on desertification and drought has been weak both at national and district levels (Imbamba, 1996).

In view of the gaps identified above and the pivotal role NGOs / CBOs play in sensitising and organising communities, there is need to organise and co-ordinate the NGOs / CBOs with regard to desertification and drought matters. Against this background, a national NGOs forum was held in 1998. Furthermore, MTENR through the NCCD established the National NGO Co-ordinating Committee on Desertification. Zambia Alliance of Women was appointed as UNCCD National Focal Point (NFP) for NGO activities on desertification. The NFP has been operational.

The Terms of Reference for the NGOs NFP include the following:

- Establish and co-ordinate provincial, district and local level structures and their activities for the NAP;
- Consult with other NGOs/CBOs, traditional leaders and NCCD on a regular basis on all matters pertaining to desertification;
- Undertake assessments of the problems of desertification to identify location and programmes for intervention;
- Facilitate the dissemination of information concerning CCD to the affected populations and in turn the NGO NFP should pass the experiences and feedback from the communities to the NCCD;

- Facilitate the mobilisation and training of affected populations on the formulation and implementation of NAP projects and activities;
- Strengthen existing information channels to and from affected communities, their CBOs and civil society through revitalisation of government extension service as well as the use of the media (radio, print and electronic media);
- Lobby to Government and donor community to support community anti-desertification projects/programmes; and
- Lobby to Government to facilitate enactment of legislation regarding participation in CCD implementation.

Despite the above establishment, similar structures at provincial, district and community levels do not exist. It is advised that workshops (organised by the NGOs and the MPU), be held at these levels with a view of creating these structures. At provincial and district level the sub-committees of the PDCC and DCCC on environment and disaster management (as is the case with DMMU) should be used.

At the community level, the creation of similar structures as those being created by ZAWA namely the CRBs, should be investigated with possibilities of improvement and emulation. The whole process of establishing committees at lower levels should be guided by principles of accountability, transparency and democracy. Their operations should also be guided by clear terms of reference supported by a Constitution.

Capacity building action at national, provincial, district, and local levels for the focal points and their committees is imperative. Areas of concentration should be on leadership, governance and competence in technical skills and in institutional procedures and systems.

## **5.2 International Co-operation and Partnership Arrangements**

The importance of the international donor community as co-operating partners in the implementation of NAP is stressed by the Convention. The CCD is the only Convention that stresses partnership rather than AID. We have identified the cooperating partners as very important stake-holders in as far as provision of finances and technology transfer to desertified developing countries are concerned in order to manage the problems of desertification and drought effectively (Mweene, 1998).

There is a large array of multilateral and bilateral funding agencies represented in Zambia, some of whom have been appraised in the past by various missions and awareness workshops on the CCD (Imbamba, 1996). The preparatory team contacted a number of funding agencies to try and solicit for their commitment to the NAP process. The following represents the organisations that were contacted in the past and during the preparation process of the NAP, and indicated commitment to supporting the NAP process as they are already supporting similar other environmental programmes in Zambia:

- World Bank;
- FINNIDA;
- NORAD;

- JICA;
- Barclays Bank;
- GTZ;
- DANIDA;
- IUCN;
- UN Agencies, particularly WFP, UNDP and FAO; and
- SIDA.

The list of the donor community agencies represented in Zambia who are party to the CCD is, however, longer than what is presented above. This indicates that others could not have been contacted due to time limitations to express their commitment.

It should also be noted that there was limited awareness on the CCD among the donor community prior to the First National Forum, such that a number of those that had been invited to participate in various workshops on the CCD did not attend (Simuunza, pers. Commun.). The opportunity to seek donor support for the NAP process, therefore, exists as long as strong contact and effective awareness is made on the part of the donor community.

NAP project briefs should be prepared and circulated to the donor community for purposes of programme fundraising and raising awareness. This should be done through round table meetings/workshops organised by the donor community facilitator as a desired mechanism/institution for enhancing co-operation and partnership between the donor community and the Government at all levels.

### **5.3 Collaboration between NAP, ESP and other programmes contributing to sustainable development**

It has been demonstrated above that the Zambian NEAP and the programme areas for NAP outlined are very closely linked. It will be important that the implementers of NEAP and NAP work closely in order to avoid duplication of efforts. The NAP Co-ordinator should also collaborate very well with other programmes contributing to sustainable development.

### **5.4 Other Institutional Measures**

The curriculum, at the University of Zambia in the School of Natural Sciences should be strengthened to include issues on land degradation.

### **5.5 Funding Sources and Mechanisms**

This document is proposing funding mechanisms and arrangements for the implementation of the NAP.

### **The Global Mechanism (GM)**

Among the various sources, the GM has already been established as the main financing mechanism for the UNCCD, housed by IFAD in Rome. Its main objective is to promote activities in terms of resource mobilisation and channelling. The GM is not a financial institution nor a financial management mechanism. It mobilises resources for the implementation of UNCCD through the following sources:

- A core budget approved by the Conference of Parties (COP) for GM functioning; and
- Voluntary contributions from multilateral and bilateral sources which include, IFAD, World Bank, Switzerland, Norway and prospectively, Denmark, Sweden, the Netherlands and Japan.

The GM facilitates conditions for other institutions to contribute funding to the implementation of the UNCCD. To this effect, GM collaborates actively with the member institutions of its Facilitation Committee, comprising World Bank, UNDP, IFAD, UNCCD Secretariat, GEF Secretariat, UNEP, FAO and Regional Development Banks (AsDB, AFDB, IADB).

The GM also supports NAP formulation and its implementation in affected countries. It also supports the establishment of the National Desertification Fund (NDF) by affected countries for the formulation and implementation of their NAP. These funds would enable financing the elaboration and implementation of Local Area Development Programmes (LADPs) at local level.

### **The National Desertification Fund (NDF)**

The CCD calls for the establishment of the National Desertification Fund, to act as a pool centre for financial resources to be drawn from the various sources. The NDF shall be a basket of funds from donors and other sources including Government for implementation of NAP activities. The NDF shall allocate and disburse financial resources to those projects/programmes based on sound and approved desertification projects/programmes and will be managed by the Programme Management Unit (PMU). With the approval of the UNCCD, the PMU shall prepare annual funding proposals for submission to various co-operating partners and through the Global Mechanism. These submissions will be within the framework of approved budgets and work plans. This shall form the basis for allocation of funds to the NDF and disbursement of funds from NDF to local level projects/programmes.

The stipulation of clear disbursement guidelines and timing of disbursements of funds is a necessity. A time limit of 60 days in which to approve and disburse funds is recommended. The dangers of delays in disbursing funds are known to affect local communities in the management of their projects due to loss of confidence. Training and capacity building at local level in drawing up of proposals, requests for funding support and management of project funds are a pre-requisite to the disbursement process. The role



of NGOs and CBOs in this process is stressed. The NDF shall be used to mobilise NGOs and CBOs in pursuing the above undertakings.

Though the existence of the ESP, DMMU and FRA are already supporting some anti-desertification projects and providing mitigation measures against the impact of drought, the operations of the fund shall rationalise the necessary support in a co-ordinated manner. Dangers of duplication shall, therefore, be avoided in this way. The PMU-NDF as a principal agency on matters of desertification and drought, shall co-ordinate all resources required for mitigating the negative impact of drought and combating desertification. The NAP Project Co-ordinator needs to work closely with the existing institutions supporting anti desertification projects/programmes.

### **Local Area Development Projects (LADPs) and Community Revolving Funds**

Development of local level community supported initiatives and strengthening of community participation in the management of projects is a principal requirement in the CCD and NAP process. This is also consistent with or complimented by Zambia's position in support for the decentralisation of administration and power to local government and grassroots institutions.

This is based on the understanding that devolution of authority to such levels allows the concerned parties to have the sense of full responsibility of management and ownership of the projects/programmes. Thus once external support is withdrawn, with adequate capacity, these institutions can take full responsibility to run the systems themselves. Contributions in form of labour and other resources, once the peoples' commitment is ascertained, are guaranteed towards self-help community projects. There must be a sense of project ownership by the community. Capacity building of the community members on matters pertaining to leadership skills, financial and project management, resource management and land use planning should be ensured. Communities should be empowered to manage revolving funds. Like at national level (NDF), the community revolving funds shall be the basis for LADPs including drought relief and land resources management.

Working out mechanisms to collect and retain revenues from resources-use programmes and fund raising through the NDF and other donors shall form the core functions of the revolving funds. Various transparent and accountable sub-committees need to be formed to run and manage the revolving fund and community programmes. There is need to review existing structures at the grass roots or local levels that deal with revolving funds. Where necessary, similar structures should be formed at the local district administration level to over-see and provide technical guidance to the community institutions. The role of the NGOs and CBOs in training and capacity building is also emphasised in this area. The NGOs and CBOs need to be supported and strengthened to meet the above challenges. In this context, the elaboration of LADPs will facilitate the NAP implementation at local level.

### **The Cotonou Agreement (June, 2000)**

The UNCCD and ACP Secretariats have facilitated the integration of activities related to combating desertification into Country Support Strategies (CSS) and substantively into National Indicative Programmes (NIP). Zambia, like many other developing countries has been asked to integrate NAP activities into the CSS. The Zambian Government should exploit this window if chances for the success of the NAP activities are to be maximised.

### **Donor Community Facilitator**

Currently, UN agencies operating in Zambia have a stake in the UNCCD. These include UNDP, FAO, WMO, WFP, UNICEF, IFAD and UNESCO. In addition, there are numerous co-operating bilateral and multilateral agencies from the developed donor community that are in support of the UNCCD.

It may prove difficult to solicit for funding for the implementation of the NAP, as different donors could have varying requirements to meet funding obligations.

The Donor Community should be consulted on the appointment of the Donor Community Facilitator. The functions of the Donor Community Facilitator shall be to:

- coordinate and identify potential donors, discuss ways and mechanisms for mobilising financing resources;
- facilitate holding of Donor Forum meetings to discuss, prioritise the NAP and responsibilities to each potential Donor;
- liaise with government PMU on the financial needs and any identified funding problems in the implementation of the NAP;
- assist PMU to consolidate funding requirements for the implementation of the NAP on annual basis of work plans and proposed budget;
- keep a profile on each programme financed by each donor for purposes of reviewing its performance in view of the committed donor input. This shall facilitate identification of shortfalls, needing further cushioning support, possibly from other donors.

These terms of reference are tentative and should be reviewed from year to year, depending on performance.

## **CHAPTER SIX: CONCLUSION**

The NAP Framework Document, which constitutes this report, is an outcome of the consultative process initiated in 1996, which involved all key stakeholders. The document outlines the problem of land degradation as one of the serious global problems, hence its Convention (UNCCD) which came into force after the 1992 Rio Earth Summit.

Zambia also experiences the severe land degradation problems. She ratified the Convention in 1996. As an affected country party, Zambia is required to prepare a NAP as a basis for implementing the UNCCD. The Zambian NAP has elaborated and documented the causes and effects of land degradation, as well as, analysed various programmes operating in Zambia which have a bearing on sustainable development and whose orientation have synergies with NAP. These are potential areas for NAP collaboration and intervention, since sustainable development is the main goal of the Convention.

The analysis has culminated in the identification and drawing up of 12 key programme areas for combating land degradation in Zambia. The vision, purpose, objectives and interventions/activities are also outlined focusing on the Five Provinces of Region I and II. The NAP aims to improve and restore productivity of the land resources and promote social economic development. It also emphasises on community participation and gender.

Institutional structures and funding inputs required for NAP implementation have been elaborated. The funding sources are also identified. An action plan in a logical framework manner has been prepared to guide the implementation of NAP.

The NAP is not a detailed project document but a programme framework. It forms the basis for developing detailed projects/programmes on land degradation and drought. The preparation of the NAP is also not a finite step, but provides an interactive framework for all stakeholders to draw-up and implement projects/programmes for combating land degradation. The NAP is subject to revision depending on circumstances, but this requires consensus of all stakeholders.

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## Appendix I: Some Environmental Conventions to which Zambia is a Party

Convention (Location, Date/Revised)	Acronyms used in Report
<b><i>International</i></b>	
<i>Convention on Plant Protection (....1951/revised 1979)</i>	
<i>Ramsar Convention on Wetlands of International Importance especially as a Waterfowl Habitat (Ramsar, 1971/revised 1982)</i>	RAMSAR
<i>Convention on the Protection of World Cultural and Natural Heritage (.... 1972)</i>	WCNH
<i>Convention on International Trade in Endangered Species of Wild Flora and Fauna (Washington, 1973)</i>	CITES
<i>Convention on the Law of the Sea (..... 1982)</i>	
<i>Convention on the Protection of the Ozone Layer (Vienna, 1995)</i>	
<i>Basel Convention on the Control of Transboundary Movement of Hazardous Waste and their Disposal, (Basel, 1989)</i>	
<i>Protocol on Substances that Deplete the Ozone Layer (Montreal, 1987)</i>	MP
<i>United Nations Framework Convention on Climate Change (New York, 1992)</i>	UNFCCC
<i>Convention on Biological Diversity (Rio, 1992)</i>	CBD
<i>United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, Paris, 1994</i>	CCD
<b><i>Regional/Restricted</i></b>	
<i>Convention on the African Migratory Locust (.... 1962)</i>	
<i>African Convention on the Conservation of Nature and Natural Resources (Algeriers, 1968)</i>	
<i>Action Plan for the Environmentally Sound Management of the Common Zambezi River System (.... 1987)</i>	ZACPLAN
<i>Lusaka Agreement on Co-operative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora, Lusaka, 1994</i>	

**Source: Aongola, 1999**



## Appendix II: Episodic Climatic Events

<u>Date</u>	<u>Episodic Event</u>
1968, June	- Lowest screen and ground minimum temperatures of $-7.1^{\circ}\text{C}$ and $-10.7^{\circ}\text{C}$ respectively, recorded at Sesheke; rime and hoar frost occurrence on branches of trees there for first time, causing considerable alarm and despondency; citrus fruits adversely affected.
1972/73	- Rainy season for many areas was poorest in 50 years; drought caused substantial drop in crop yields and reduction in groundwater reserves.
1974, July	- Maize seriously attacked by cob rots (up to 25% attack in places)
1978, Feb	- Flood around Lusaka.
1978, Feb	- Heavy rains caused some damage to agricultural crops in many parts of the country.
1979, Jan	- Drought reduced maize production by 25-40%.
1980, Feb	- Three-week dry spell, from mid January to mid-February caused considerable losses to the 1980 maize crop in Southern Province
1981/82	- Below normal rainfall caused reductions in crop production as well as livestock production. Rainfall deficits ranged from 30 to 50% (Southern & Western Provinces), 10 to 40% (elsewhere). Luano Valley of Central Province experienced famine
1982/83	- Frequent dry spells in January, February, & March led to poor performance of agricultural sector, especially southern half of Zambia.
1983/84	- Drought reduced agricultural yields for the third consecutive season; worst affected areas were Southern, Central and Western Provinces.
1986/87	- Frequent dry spells between February and March led to widespread crop failure in Southern Province and affected the total national maize production.
1989, Jan/Feb	- Heavy rains in mid-season caused extensive waterlogging in crop fields; in Chipata district 60% of the total seasonal rainfall was received in January alone! Around Lusaka many people whose houses collapsed were left homeless.

- 1990, March - Persistent dry spell caused severe moisture stress in the major growing areas of Southern, Central, Lusaka and Eastern Province.
- 1991, Jan/Feb - Southern, Central and Lusaka Provinces experienced dry weather conditions. Marketed maize was only 46% of annual requirement.
- 1992,Jan/Feb - Worst drought for many years hit at the most critical crop stage (silking). The President, Mr. F.T.J. Chiluba, declared the whole Southern Province and sections of Eastern Province, Central Province and Western Province disaster areas. Later in February the President also declared the remaining areas of Zambia disaster areas.
- 1993/94 - Drought and water scarcity problems in the low and medium rainfall zone.
- 1994/95 - Continued drought in the low and medium rainfall zone.
- 1996/97 - High rainfall zone experienced drought, while the low and medium zone received adequate rainfall.
- 1997/98 - El Nino had two effects on the Zambian weather; excessive rains in the northern half and normal to below normal in the southern half

**Appendix III: Programme Matrix: Main Programme Objectives, Programme Outputs and Interventions**

**Table a: Logical Framework Matrix of the Main Programme**

Narrative Summary	Performance Indicators	Means of Verification	Assumptions
<p><b>Goal</b> To restore land productivity by using sustainable means of conserving it in order to reduce poverty and foster sustainable development</p>	<ol style="list-style-type: none"> <li>1. Land degradation reduced to manageable levels</li> <li>2. Negative impacts of drought occurrence reduced</li> <li>3. Resource-based livelihoods improved</li> </ol>	<ol style="list-style-type: none"> <li>1. Baseline Report(s)</li> <li>2. Impact Evaluation Report(s)</li> <li>3. Progress Reports</li> </ol>	<ul style="list-style-type: none"> <li>◆ Financial resources readily available for the implementation of the NAP</li> <li>◆ Collaborating partners and other stakeholders will cooperate and meet their obligations</li> </ul>
<p><b>Purpose</b> To identify the factors contributing to desertification and to put in place practical measures necessary to combat desertification and mitigate the effects of drought</p>	<ol style="list-style-type: none"> <li>1. An inventory of factors that contribute to desertification identified by December, 2003</li> <li>2. Practical measures necessary to combat desertification and mitigate the effects of drought put in place by mid 2004</li> </ol>	<ol style="list-style-type: none"> <li>1. An inventory Report</li> <li>2. # of measures put in place</li> </ol>	<ul style="list-style-type: none"> <li>• Financial resources provided for undertaking the inventory and putting practical measures in place</li> </ul>

**Table b: Logical Framework Matrix of the Outputs and Interventions**

<b>Outputs</b>	<b>Interventions/Activities</b>	<b>Performance Indicators</b>	<b>Means of verification</b>	<b>Assumptions</b>
<p><b>1. Early warning and preparedness mechanisms established</b></p>	<ol style="list-style-type: none"> <li>1. Assess the current early warning systems</li> <li>2. Improve the early warning and response capacity</li> <li>3. Evaluate the current strategies and methodologies for assessing the impacts of climatic variability on natural resources and humans</li> <li>4. Utilise predictions of climatic variability in an effort to mitigate the effects of Drought by ensuring that information reaches decision makers, planners and affected populations</li> <li>5. Develop sustainable and appropriate programmes for both crops and livestock</li> <li>6. Establish alternative livelihood support projects that could provide income in</li> </ol>	<ol style="list-style-type: none"> <li>1. One Assessment undertaken</li> <li>2. Early warning and response systems operating effectively</li> <li>3. Evaluation activity undertaken</li> <li>4. Methodologies that incorporate all required variables assessed</li> <li>5. Impact data collected and interpreted</li> <li>6. # of seminars, workshops, meetings and field days conducted</li> <li>7. Affected populations implementing mitigation measures</li> <li>8. Widespread awareness on sustainable land-use systems among the communities</li> <li>9. Sustainable land-use systems being practised by communities</li> <li>10. Communities engaged in various income generating activities</li> <li>11. Resources to support national institutions available</li> <li>12. High response capacity of national institutions</li> </ol>	<ol style="list-style-type: none"> <li>1. Assessment Report</li> <li>2. Progress Reports and Evaluation Reports</li> <li>3. Evaluation Report</li> <li>4. Assessment Report</li> <li>5. Impact data and Evaluation Reports</li> <li>6. Public awareness materials and seminars, workshops, meetings and field day reports</li> <li>7. Progress Reports</li> <li>8. Public awareness materials and seminars, workshops, meetings and field day reports</li> <li>9. Progress Reports</li> <li>10. # of communities engaged, Progress Reports</li> <li>11. Financial Progress reports</li> <li>12. Progress Report</li> <li>13. Staff appraisal Reports</li> </ol>	<ul style="list-style-type: none"> <li>◆ Financial resources readily available for the implementation of the NAP</li> <li>◆ Collaborating partners and other stakeholders will co-operate and meet their obligations</li> <li>◆ Political climate supportive of the implementation of NAP</li> </ul>

	<p>drought prone areas</p> <p>7. Support national centres/institutions by providing them adequate resources, better equipment for the enhancement of procurement, processing and dissemination of information about natural disasters</p>	<p>13. Skilled manpower put in place in National Institutions</p>		
<p><b>2. Forests, ecosystems endangered species conserved</b></p>	<p>1. Promote and support a programme of afforestation, plantation agroforestry for supply of wood fuel, poles, timber and fodder and soil conservation and fertility improvement</p> <p>2. Direct work of extension on organising and training communities in preparation and maintenance of community owned nurseries and woodlots</p> <p>3. Promote awareness creation and train communities to draft and implement by-laws in order to sensitise communities to reduce indiscriminate cutting of trees.</p>	<p>1. Afforestation Programme is put in place.</p> <p>2. Community plantations established and communities practising agroforestry</p> <p>3. Extension Service operative and extension materials available.</p> <p>4. Communities maintaining their own nurseries and woodlots</p> <p>5. Training programme for communities on drafting by-laws put in place</p> <p>6. Public awareness materials for communities on how to reduce deforestation made available.</p> <p>7. Community awareness on deforestation enhanced</p> <p>8. Incentive scheme implemented</p> <p>9. Benefits received by communities from planting</p>	<p>1. Progress Reports, Review Reports</p> <p>2. Progress Reports, Review Reports, Media Reports</p> <p>3. Progress Reports, Review Reports, Media Reports extension materials</p> <p>4. Progress Reports, Review Reports, Media Reports extension materials</p> <p>5. Progress reports, Community documents, Training materials</p> <p>6. Public awareness materials</p> <p>7. Progress Reports, Review Reports, Public awareness materials</p> <p>8. Progress Reports, Review reports</p>	<p>◆ Financial resources readily available for the implementation of the NAP</p> <p>◆ Collaborating partners and other stakeholders will co-operate and meet their obligations</p> <p>◆ Political climate supportive of the implementation of NAP</p>

	<p>4. Introduce and implement an incentive scheme to plant and replant trees</p> <p>5. Emphasise on selection and proliferation of appropriate indigenous drought tolerant species</p> <p>6. Determine the current status of forests and deforestation.</p> <p>7. Review the list of species being affected by deforestation and land degradation</p> <p>8. Revise legislation on endangered species accordingly to provide for their protection.</p>	<p>trees</p> <p>10. Indigenous plants propagated</p> <p>11. Assessment undertaken</p> <p>12. New species affected by deforestation available or published</p> <p>13. Revised legislation enacted</p>	<p>9. Progress Reports, Review Reports</p> <p>10. Progress Reports</p> <p>11. Assessment Study Report, Progress Reports</p> <p>12. New list(s) of endangered species, Progress Report, Review Reports, Study Reports</p> <p>13. New subsidiary legislation on endangered species, Progress Reports, Review Reports</p>	
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<p><b>3. Water catchment and energy conservation</b></p>	<ol style="list-style-type: none"> <li>Promote preparation and implementation of community catchment plans</li> <li>Promote techniques for the development of surface and ground water for humans, agriculture and livestock</li> <li>Promote increased tree planting in degraded areas</li> <li>Promote reduced use of wood fuel through use of fuel-efficient stoves using techniques that are culturally adaptable</li> <li>Develop and promote low-cost alternative sources of energy</li> <li>Promote photo-voltaic electricity applications for rural health centres, water supply and irrigation, and cottage industries</li> <li>Promote awareness among the local people</li> <li>Develop policies for forestry sector that should keep prices of forestry products at commercial level</li> </ol>	<ol style="list-style-type: none"> <li>Community catchment plans prepared and available</li> <li># of Communities implementing sustainable techniques</li> <li># of Communities replanting in Degraded areas</li> <li>Communities are adopting and using fuel-efficient stoves</li> <li>Low-cost alternative sources of energy are available on the market</li> <li>Photo voltaic electricity available in rural health centres</li> <li>The public is aware about the availability of low cost energy sources</li> <li>New policies and legislation on Forestry developed which incorporate economic prices of Forestry products</li> </ol>	<ol style="list-style-type: none"> <li>Catchment plan Maps, Documents, Progress Reports, Review reports</li> <li>Progress Reports, review Reports</li> <li>Progress Reports, review Reports</li> <li>Progress reports, Review reports, Mass media reports</li> <li>Public awareness material, survey Reports progress Reports</li> <li>New legislation, New Policy Document, Progress Reports, Review Reports</li> </ol>	<ul style="list-style-type: none"> <li>Financial resources readily available for the implementation of the NAP</li> <li>Collaborating partners and other stakeholders will co-operate and meet their obligations</li> <li>Political climate supportive of the implementation of NAP</li> </ul>
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<p><b>4. Collaboration and Networking</b></p>	<p>1. Promote exchange of research data, early warning information</p> <p>2. Promote exchange visits</p> <p>3. Promote training</p> <p>4. Promote regional workshops</p>	<p>1. Land Information available to all stake-holders</p> <p>2. All stake holders to undertake or participate in exchange visits</p> <p>3. Training on Land Degradation matters undertaken by all concerned groups</p> <p>4. Regional Workshops on land degradation undertaken by all concerned groups.</p>	<p>1. Progress Reports, Review Awareness materials</p> <p>2. Progress Reports, Workshop Materials, Progress Reports</p> <p>3. Training Materials, Progress Reports</p> <p>4. Workshop proceedings, Progress Reports, Review Report</p>	<p>◆ Financial resources readily available for the implementation of the NAP</p> <p>◆ Collaborating partners and other stakeholders will co-operate and meet their obligations</p> <p>◆ Political climate supportive of the implementation of NAP</p>
<p><b>5.Capacity Building</b></p>	<p>1. Provide adequate training to personnel and communities</p> <p>2. Carry-out overall needs assessment of all stakeholders</p> <p>3. Provide support to the regional Disaster Training Centre in Kabwe (RDMC)</p>	<p>1. Personnel and communities trained adequately</p> <p>2. Personnel and communities executing their programmes adequately</p> <p>3. Needs assessment undertaken for all stakeholders</p> <p>4. RDMC providing training on land degradation and Drought adequately</p>	<p>1. Training Materials, Training Reports, Progress Reports, Review Reports</p> <p>2. Progress Reports, Review Reports</p> <p>3. Needs Assessment Reports, Progress Reports</p> <p>4. Land Degradation Syllabus Document, Progress Reports, Review Reports</p>	<p>◆ Financial resources readily available for the implementation of the NAP</p> <p>◆ Collaborating partners and other stakeholders will co-operate and meet their obligations</p> <p>◆ Political climate supportive of the implementation of NAP</p>



<p><b>6.Extension, Public Awareness and Information Dissemination</b></p>	<p>1. Provide an effective Outreach programme</p> <p>2. Conduct massive campaigns to educate the people on the problems of Desertification</p> <p>3. Improve the government extension and training systems</p> <p>4. Provide training to staff and farmers including skill training</p> <p>5. Provide support on exchange visits for farmers, extension workers and management staff</p>	<p>1. Out reach programme implemented and # of communities receiving extension and information</p> <p>2. Campaigns undertaken on how to combat land degradation</p> <p>3. Communities able and capable in undertaking land degradation control measures</p> <p>4. Government extension and training systems operating effectively</p> <p>5. # of Staff and Farmers undertaking training</p> <p>6. # of Exchange visits undertaken</p>	<p>1. Extension Materials, Progress Reports, Awareness materials</p> <p>2. Extension Materials, Progress Reports, Awareness Materials</p> <p>3. Extension Materials, Progress Reports, Awareness materials</p> <p>4. Progress Reports, Extension and Training Materials, Review Reports Training reports</p> <p>6. Progress Reports, Extension and Training Materials, Review Reports</p> <p>7. Progress Reports, Exchange Visit Reports, Review Reports</p>	<p>◆ Financial resources readily available for the implementation of the NAP</p> <p>◆ Collaborating partners and other stakeholders will co-operate and meet their obligations</p> <p>◆ Political climate supportive of the implementation of NAP</p>
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<p><b>7. Assessment, Monitoring and Reporting</b></p>	<p>1. Provide bench markers for assessing land degradation</p> <p>2. Assess land degradation problems in Zambia</p> <p>3. Put in place mechanisms for EIAs of all NAP programmes</p> <p>4. Put in place monitoring and reporting mechanisms</p> <p>5. Mechanisms for reviews or external evaluations put in place</p> <p>6. Promote participation of all stake-holders in the above</p>	<p>1. Documents on Indicators available</p> <p>2. Assessment reports available</p> <p>3. EIA systems manual for NAP available</p> <p>4. Progress Reporting and Monitoring systems put in place</p> <p>5. # of External Evaluation undertaken</p> <p>6. Full participation and implementation of programmes on land degradation</p>	<p>1. Documents on indicators, Progress Reports, Review Reports</p> <p>2. Assessment Reports, Progress Reports, Review Reports</p> <p>3. EIA Documents, Progress Reports, Review Reports</p> <p>4. Progress Reports, Minutes of Meetings</p> <p>5. Review Reports, Progress Reports, Evaluation Reports, Proceedings on Meetings, Project Documents Reports</p>	<ul style="list-style-type: none"> <li>◆ Financial resources readily available for the implementation of the NAP</li> <li>◆ Collaborating partners and other stakeholders will cooperate and meet their obligations</li> <li>◆ Political climate supportive of the implementation of NAP</li> </ul>
<p><b>8. Easy to use environmental friendly technologies including Indigenous Knowledge</b></p>	<p>1. Promote technological transfer</p> <p>2. Emphasise on increased awareness and incentive schemes support</p> <p>3. Undertake inventory of existing traditional practices</p>	<p>1. Improved sustainable technologies being practised</p> <p>2. The Public made aware of improved and sustainable technologies</p> <p>3. Incentive scheme in place and communities getting benefits</p> <p>4. Studies undertaken</p>	<p>1. Awareness and Adoption survey Reports, Progress Reports, Review Reports</p> <p>2. Awareness and adoption survey reports, progress reports, review reports</p> <p>3. Awareness and adoption survey reports, Progress reports,</p>	<ul style="list-style-type: none"> <li>◆ Financial resources readily available for the implementation of the NAP</li> <li>◆ Collaborating partners and other stakeholders will cooperate and meet their obligations</li> <li>◆ Political climate supportive of the implementation of NAP</li> </ul>

<p><b>9.Livelihood Improvement Promote Development of Economic Infrastructure Income generating activities implemented Game Management</b></p>	<ol style="list-style-type: none"> <li>1. Improve Access (feeder) roads</li> <li>2. Identity and develop areas with development potential as satellite growth centres</li> <li>3. Provide market facilities and other social services</li> <li>4. Facilitate empowerment of the local communities with the responsibilities to manage game resources</li> <li>5. Promote income generating schemes(cutting, safari-hunting, ranching and tourism ventures) for the communities and the private sector</li> <li>6. Promote use of electric wire fencing to deter conflicts between humans and animals</li> <li>7. Provide Training on management of electric fencing by the community</li> <li>8. Review and strengthen current village scout programme under ADMADE</li> <li>9. Introduce informer net-works to deter illegal hunting</li> <li>10. Introduce bonuses/incentives for informers</li> <li>11. Promote other Income Generating Activities for</li> </ol>	<ol style="list-style-type: none"> <li>1. # of Access Roads made or improved.</li> <li>2. Land-Use plans, and zonation Maps prepared</li> <li>3. Economic facilities according to land-use plan built</li> <li>4. The Principal Acts should contain provisions for community empowerment over management of resources</li> <li>5. Income generating base enhanced in local communities</li> <li>6. Communities engaged in various income generating activities</li> <li>7. Electric fences erected in conflict areas</li> <li>8. Community training received on management of electric fencing</li> <li>9. ADMADE scout programme operating properly</li> <li>10. Informer Net-works implemented and operative</li> </ol>	<p>review reports</p> <ol style="list-style-type: none"> <li>4. Study reports progress review</li> <li>1. Progress reports</li> <li>2. Land-Use plan document, Progress Reports, review reports</li> <li>3. Progress Reports, Review Reports</li> <li>4. New Principal Acts, Progress Reports, Review Reports</li> <li>5. Progress Reports, Review Reports</li> <li>6. Progress Reports, Review Reports</li> <li>7. Progress Reports</li> <li>8. Progress Report, Training materials, workshops, Review Reports</li> <li>9. Progress Reports</li> <li>10. Progress Reports</li> <li>11. Progress Reports, review reports, Informer reports</li> <li>12. Progress reports, Review Reports</li> <li>13. Progress Reports, Review Reports</li> <li>14. Management Plan Report</li> </ol>	<ul style="list-style-type: none"> <li>◆ Financial resources readily available for the implementation of the NAP</li> <li>◆ Collaborating partners and other stakeholders will cooperate and meet their obligations</li> <li>◆ Political climate supportive of the implementation of NAP</li> </ul>
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	<p>example, bee-keeping, carpentry, sustainable timber harvesting, and fish farming.</p> <p>12. Prepare and implement management plans</p>	<p>11. Informers receive bonuses and other benefits</p> <p>12. Income generating activities increased in the local communities</p> <p>13. Household incomes increased</p> <p>14. Management Plans prepared</p>		
<p><b>10. Food self sufficiency and food security</b></p>	<ol style="list-style-type: none"> <li>1. Promote improved livestock production</li> <li>2. Promote soil fertility and conservation measures</li> <li>3. Enhance crop diversification</li> <li>4. Implement a seed multiplication programme</li> <li>5. Strengthen the existing extension services</li> <li>6. Improve overall farm management</li> <li>7. Promote small scale irrigation schemes</li> <li>8. Promote drought tolerant crop varieties</li> </ol>	<ol style="list-style-type: none"> <li>1. Farmers are adopting improved range land management practices</li> <li>2. Communities are adopting soil conservation practices</li> <li>3. Communities are growing a wide variety of crops</li> <li>4. A seed multiplication programme put in place</li> <li>5. Extension services is operative</li> <li>6. Improved farm management technologies adopted by farmers</li> <li>7. Irrigation projects implemented in the communities</li> <li>8. Drought tolerant crops grown</li> </ol>	<ol style="list-style-type: none"> <li>1. Adoption survey reports, progress reports, review reports</li> <li>2. Adoption survey Reports, Progress Reports, Review Reports</li> <li>3. Adoption survey Reports, Progress Reports, Review Reports</li> <li>4. Adoption survey Reports, Progress Reports, Review Reports</li> <li>5. Adoption survey Reports, progress Reports, Review Reports</li> <li>6. Adoption Survey Reports, Progress Reports, Review Reports</li> </ol>	<ul style="list-style-type: none"> <li>◆ Financial resources readily available for the implementation of the NAP</li> <li>◆ Collaborating partners and other stakeholders will cooperate and meet their obligations</li> <li>◆ Political climate supportive of the implementation of NAP</li> </ul>

<p><b>11. Human Settlement Management</b></p>	<ol style="list-style-type: none"> <li>1. Prepare and implement regional land-use plans through involvement of local communities</li> <li>2. Promote sustainable land management practices</li> <li>3. Promote and provide family planning programmes</li> <li>4. Identify development centres/zones to direct or attract human population</li> <li>5. Direct extension services and other development activities to development centres</li> </ol>	<ol style="list-style-type: none"> <li>1. Regional land-use plans prepared</li> <li>2. Regional land-use plans implemented by local communities</li> <li>3. Communities aware and implementing sustainable land management practices</li> <li>4. Communities adopting family planning practices</li> <li>5. Communities aware of family planning practices</li> <li>6. Development zones identified and developed</li> <li>7. Human population attracted to Development centres</li> <li>8. Development activities and social services available in development centres/zones</li> </ol>	<ol style="list-style-type: none"> <li>7. Adoption survey Reports, Progress Reports, Review Reports</li> <li>8. Adoption Survey Reports, progress Reports, Review Reports</li> </ol>	<ol style="list-style-type: none"> <li>1. Progress land-Use Document</li> <li>2. Land-use plan document, Progress Reports</li> <li>3. Attitude or adoption survey Reports, Review Reports, Progress Reports</li> <li>4. Attitude or Adoption Survey Reports, Review Reports, Progress reports. Awareness materials</li> <li>5. Attitude or Adoption Survey Reports, Review Reports, Progress Reports. Awareness Materials</li> <li>6. Land-use plan document, Progress Reports, Review Reports</li> </ol>	<ol style="list-style-type: none"> <li>7. Adoption survey Reports, Progress Reports, Review Reports</li> <li>8. Adoption Survey Reports, progress Reports, Review Reports</li> </ol>	<ul style="list-style-type: none"> <li>◆ Financial resources readily available for the implementation of the NAP</li> <li>◆ Collaborating partners and other stakeholders will cooperate and meet their obligations</li> <li>◆ Political climate supportive of the implementation of NAP</li> </ul>
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			<p>7. Land-use Document, Progress Reports, Review Reports</p> <p>8. Land-use plan Document, progress reports, Review Report</p>	
<p><b>12. Legal and Policy Reviews</b></p>	<ol style="list-style-type: none"> <li>1. Speed up the process of formulating a coherent and consolidated policy on environmental matters</li> <li>2. Formulate a policy on measures to combat desertification and mitigate the effects of drought</li> <li>3. Formulate subsidiary legislation to allow all sectors to operate as one inter-sectoral organ at lower levels</li> <li>4. Revise principal fees to allow revision in raising levels of penalties</li> <li>5. Revise principal acts to empower communities to manage natural resources</li> <li>6. Facilitate debate on resources and land tenure issues</li> <li>7. Revise the Lands Act to permit communities to impose tourism levies in GMAs and other areas outside National Parks</li> </ol>	<ol style="list-style-type: none"> <li>1. Policy on Environment and Document available</li> <li>2. Specific Policy on land degradation and Drought formulated</li> <li>3. Subsidiary Legislation Document formulated</li> <li>4. Revised Acts available</li> <li>5. Principal Acts revised should contain empowerment laws</li> <li>6. Workshops held</li> <li>7. Awareness activities held</li> <li>8. Lands Act Revised and contain New Levy Laws</li> </ol>	<ol style="list-style-type: none"> <li>1. Policy Document, Progress Reports, Review Reports, Awareness materials</li> <li>2. Policy Document, Progress reports, review Reports, Awareness materials</li> <li>3. Policy Document, Progress Reports, Review Reports, Awareness materials</li> <li>4. Policy Document, Progress Reports, Review Reports, Awareness materials</li> <li>5. Revised Principal Acts Documents, Progress Reports, Review Reports, Awareness Reports, Awareness Materials</li> </ol>	<ul style="list-style-type: none"> <li>◆ Financial resources readily available for the implementation of the NAP</li> <li>◆ Collaborating partners and other stakeholders will cooperate and meet their obligations</li> <li>◆ Political climate supportive of the implementation of NAP</li> </ul>

