

**National Action Plan to combat  
Desertification/Land degradation in  
Democratic People's Republic of Korea  
(2006-2010)**

**June, 2006**

# Table of Contents

Forward.....	1
Chapter 1. Natural and Socio-economic Background; Land degradation Issues .....	3
Section 1. Basic Understanding on the UN Convention to Combat Desertification .....	3
Section 2. Background information on nature and socio- economy .....	6
1. Geographical location and topography .....	6
2. Climate and Hydrology .....	7
3. Land resources .....	7
4. Forests and biodiversity .....	8
5. Economy and Agriculture .....	9
6. Culture and Populations .....	10
7. Main environmental issues .....	10
1) Deforestation and forest degradation.....	10
2) Land degradation .....	11
3) Degradation of marine and coastal ecosystems .....	11
4) Loss of biological diversity .....	11
5) Degradation of water quality .....	12
6) Air pollution .....	12
7) Solid waste .....	13
8) Natural disasters .....	13
Section 3. Main issues of land degradation .....	13

1. Causes and effects of land degradation.....	13
2. Deforestation and forest land degradation .....	16
3. Degradation of agricultural land (including rangeland) .....	17
4. Climate change and water resources.....	18
5. Natural disasters .....	19
Chapter 2. Policy/legislations; Institutional system and Existing activities related to land management.....	19
Section 1. Major land management policies .....	19
Section 2. Legislations related to land management .....	22
Section 3. The recent land management policies and activities to address the land degradation .....	25
Section 4. Institutional system for land management .....	26
Section 5. Constraints and gaps in current land management .....	28
Chapter 3. National Action Plan (NAP) to Combat Land Degradation .....	31
Section 1. Participatory Approach in Preparation of the NAP .....	31
Section 2. Goals, programmes and Activities.....	33
1. Strategic goals .....	33
2. Targeted Indicators .....	34
3. Immediate targets (2006–2010).....	34
4. Programmes, Objectives and Activities .....	35
Section 3. Priorities for international cooperation .....	42
Section 4. Institutional Arrangement to combat land degradation .	55
Chapter 4. Potential Financial Sources.....	58
1. Internal sources .....	58

2. Financial support from international agencies.....	59
Chapter 5. Monitoring, Evaluation and Communication on the Progress of NAP Implementation .....	62
Annex 1. Stakeholder agencies involved in the process of UNCCD– NAP preparation .....	64
Annex 2. List of member of working group for preparation of national action plan .....	65
Annex 3. National workshops and consultations related to the preparation of national action plan.....	66

# Forward

**“Based on the proper management of the land resources we can increase continuously the agricultural production and people’s livelihood”**

**Kim Jong Il**

The development of the National Action Plan to combat land degradation is one of the initial steps of DPR Korea towards implementating the Convention to Combat Desertification.

Today, along with the adverse climate change and loss of biodiversity, the land degradation has become one of the major environmental issues challenging the improvement of people’s livelihood, food security and sustainable socio-economic development.

The occurance of more frequent floods and droughts and other disastrous phenomenon are, directly or indirectly, related to severe degradation of land resources.

In the global context, the main causes of land degradation are considered to be the extensive and inappropriate development and use of land resources by human beings, mainly unsustainable agricultural practices; overgrazing; and deforestation

As they are closely linked with the human’s needs for survival including, for example, the demand for food and energy, it is generally recognized that the sustainable socio-economic development could not be achievable without careful consideration of living conditions and interests of local peoples affected in dealing with the land degradation issues.

The Government of DPR Korea has set the political strategy for constructing prosperous and powerful country which aims at improvement of people’s livelihood and steady development of society and national economy.

For the implementation of this government’s strategy it is imperative to consider and take account the seriousness of today’s land degradation issues, take proper measures for preventing land degradation and ensuring the sustainable land management based on proper assessment of land use practices and land degradation status. It also requires a number of scientific, technical and practical issues to be tackled.

The prevention of land degradation and implementation of rationale and sustainable management of land resources could be achieved with success if the processes involve the partnership and collaboration among all stakeholders concerned.

In this context, the national action plan(NAP) to combat land degradation in DPR Korea have been developed through the processes of active participation from, and close collaboration among, relevant government agencies such as Ministry of Land and Environment

Protection(MLEP), Ministry of Agriculture, Ministry of 립업, and scientific institutions and universities. This partnership has laid important basis for effective implementation of the NAP. The national action plan presents the strategic options and activity programmes for the implementation of UN Convention to Combat Desertification(UNCCD) in DPR Korea and will be regularly updated in the process of its implementation in integrated manner with other country's sustainable development strategy and action plans.

# Chapter 1. Natural and Socio-economic Background; Land degradation Issues

## **Section 1. Basic Understanding on the UN Convention to Combat Desertification**

Land degradation poses an important constraint in achieving sustainable development. The World Summit on Sustainable Development (WSSD) recognized that the achievement of the ultimate Millennium Development Goal (MDG) of eradicating extreme poverty much depends on tackling land degradation. Poverty in developing countries is often rural poverty which means marginal lands, highly susceptible to land degradation.

Land degradation results in loss of productivity and reduced income, and threatens the survival of communities and the nutritional status of populations as well as food security.

The negative impacts of land degradation undermine the structure and function of ecological systems. Land degradation often leads to soil and water resource degradation and reduction in flora and fauna bioactivity. Changes in land cover and vegetation status contribute to climate change, alter biodiversity and modify hydrological cycles.

This is a worldwide problem that crosses geographical boundaries, and must be dealt with in a holistic and integrated way.

Amidst the growing concern about the wide spreading land degradation including desertification and drought, the world community has started to take actions including international cooperation to reverse this trend.

### - UN Convention to Combat Desertification (UNCCD)

United Nations Convention to Combat Desertification in those countries experiencing serious drought and/or desertification, particularly in Africa or UNCCD was adopted on 17. June 1994 at the special session of UN Assembly and entered into force on 26 December 1994 after it had been ratified by first 50 countries. As of 2004, 191 countries have ratified the UNCCD to become party members to the convention..

The DPR Korea has ratified the UNCCD in late December 2003 and is active as a party country to the convention since April 2004.

The desertification means, according to convention, “land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities”.

The term was broadened to the general land degradation to address properly the land degradation issues including desertification and implement the sustainable land management, and later the land degradation has become the focal areas of GEF assistance.

The Second GEF Assembly in October 2002, designated land degradation, primarily desertification and deforestation, a focal area of the GEF as a means to support the implementation of UNCCD.

In May 2003, the GEF Council approved the operational program on sustainable land management (OP15) to promote the efforts of nations and countries, particularly the developing countries, to address the land degradation issues in integrated and cross-sectoral approach and within the framework of sustainable development, and to create enabling environment for financial and technical assistance from GEF.

– Linkage with other UN environmental conventions

1) The “Agenda 21”, a comprehensive environmental blueprint with consideration of human impacts on environment, highlights in chapter 12 6 programme areas of action for managing fragile ecosystems: combating desertification and drought.

Among them, the following areas are more or less related to the specific conditions of DPR Korea;

(b) Combating land degradation through, inter alia, intensified soil conservation, afforestation and reforestation activities;

(e) Developing comprehensive drought preparedness and drought-relief schemes;

(f) Encouraging and promoting popular participation and environmental education, focusing on desertification control and management of the effects of drought.

2) UN Convention on Biological Diversity (UNCBD) and UN Framework Convention on Climate Change (UNFCCC)

The DPR Korea ratified both the conventions in June 1992 and became a membership of them since 12 December 1994.

Land degradation and drought are closely related with the impacts of climate variations, has the consequences of reducing primary and ecologically fragile land resources necessary for food and fibre production, and contribute to the severe loss of biodiversity with the continuous negative cycles of damagable effects including destruction of natural vegetative covers.



Desertification, climate change and biodiversity loss are interlinked together with complexity and deserve the growing concern for immediate action, thus the UNCCD should necessarily be implemented in conjunction with UNCBD and UNFCCC.

### 3) UN Millenium Development Goals (MDGs)

The millenium development goals (MDGs) comprise of 8 components; goal 1: “eradicate extreme poverty and hunger” set the target to”halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day”(e.g. reduction from 28.3% to 14.2%)

The goal also set the target to halve during the same time schedule the proportion of people who suffer from hunger.

As the UNCCD serves as a tool for the poverty reduction in affected areas through curbing the land degradation and implementing sustainable land management, it has to take in to account the implementation of MEGs.

#### - National obligations to UNCCD implementation

As a member country of UNCCD, the efforts of DPR Korea may have the focus on preventing further degradation, rehabilitating degraded land resources and gradually improving land use practices.

The national obligations to implement the UNCCD are, inter alia, as follows;

- 1) development of NAP (Article 9 and 10), and communication and reporting to COP (Articles 21 and 26);
- 2) Development of long term national strategy and priority measures to combat land degradation (in integration with the national sustainable development and poverty reduction strategy) (Article 4)
- 3) Establishment of institutional mechanism to combat desertification/land degradation (Article 4)
- 4) Promotion of education, training and public awareness (Articles 5(d), 19, 6 )
- 5) Ensuring the public participation in prevention of land degradation (Articles 19.3(b), 10.2(f), 5(d),)
- 6) Proper legislation (Article 5(e))
- 7) Gathering, processing and exchange of information (Article 16)
- 8) Promoting research and development(R&D), training (Articles 17,

As shown above, the development and implementation of NAP is the prerequisite of country’s obligation to UNCCD.

The National Action Plan (NAP) outlines the current status, causes and impacts of land degradation and drought, and identifies the options to prevent the land degradation and rehabilitate the degraded land resources.

The NAP defines also a list of programme, priority activities and projects to tackle the land degradation issues in holistic way in DPR Korea.

Considering the requirements of the convention, the NAP focuses on ensuring the active participation and involvement of local peoples/communities in combating the land degradation. It calls the partnership and collaboration of all stakeholders in implementing sustainable land management.

The Ministry of Land and Environment Protection(MLEP) is an authority responsible for development, implementation and coordination of the NAP, and Ministry of Agriculture and Ministry of Forest Industry are the major stakeholder agencies in implementing the NAP.

However, the implementation process of the NAP should involve all stakeholders ranging from central government agencies to local communities, scientific institutions and public organizations/associations.

## **Section 2. Background information on nature and socio-economy**

### **1. Geographical location and topography**

DPR Korea is situated in eastern part of Asian continent between 37°41'~ 43°01' of northern latitude and 124°11'~ 130°41' of eastern longitude.

It is neighboring to north-east of China and Far-east of Russia on the north with Amnok river and Tuman river as the frontiers, and borders both sides east and west with seas.

The DPR Korea has the mountainous terrain covering approximately 80% of total terrestrial area, and is characterized by steep slopes, deep valleys and numerous rivers and brooklets.

The average elevation of the country is 586m and the highest mountain is Mt. Paektu(2750m asl.).

The country has generally severe variation of mountainous relief with maximum deviation of 1500m, thus the majority of the territory are consisted of sloping lands.

The land cover rates by gradients in DPR Korea are as follows;

Gradient(° )	< 5	5~15	15~25	25<
Rate of land cover(%)	21.52	21.19	24.13	33.16

## 2. Climate and Hydrology

The DPR Korea has the temperate climate with distinct 4 seasons , and the annual mean temperature is 8.9°C (Pyongyang) with the deviation between 0°C~10°C by region.

The average precipitation is between 1,000~1,200mm per annum. Usually, spring (from April to June) is dry and summer is wet. During the rainy season in summer between July and August the precipitation reaches above the half of the annual precipitation. However, recently due to the climatic change the annual mean precipitation tends to decline to 900~1,000mm and rainy season has no clear appearance.

There are about 100 natural lakes and 1,700 artificial reservoirs, 10,208 streams and brooklets including 38 major big rivers in DPR Korea.

The total length of all streams accounts for 64,855km, of which 5,355km for big rivers and 59,500km for small and medium sized streams, indicating the high density of water courses(0.4km~0.5km/km<sup>2</sup>).

The area of water bodies including lakes, reservoirs and streams covers 7,374km<sup>2</sup> or 6% of total land area.

## 3. Land resources

The total land area of DPR Korea accounts for 123, 138km<sup>2</sup> and are divided into 6 land use categories.

Forest land	89,273 km <sup>2</sup>	72.5%
Agricultural land	20,421 km <sup>2</sup>	16.6%
Residential land	1,659 km <sup>2</sup>	1.3%
Industrial land	2,063 km <sup>2</sup>	1.7%
Water land	7,374 km <sup>2</sup>	6.0%
Others	2,348 km <sup>2</sup>	1.9%

There are diverse soil types in the country with distinct horizontal and vertical zonalities in their distribution.

The bedrock consists normally of granite, granite-gneiss, limestone and slate (or argillite). The soils are classified by 12 types.

#### 4. Forests and biodiversity

The DPR Korea has about 9million ha of forest lands or 72.5% of total land area.

The forest lands are largely concentrated in northern inland areas with high mountains, whereas western coastal areas have less forest lands but more level land areas.

The averages of standing forest tree volume are 47.5 m<sup>3</sup> per ha for total forest lands and 57.3 m<sup>3</sup> per ha in timber forests, respectively.

The forests are characterized typically by temperate mountainous forests.

They consist of coniferous, broadleafed and coniferous-broadleafed mixed forests. The distribution ratio of each forest types is slightly different.

The coniferous forests are comprised by temperate pine forests, subarctic spruce and fir forests, larch forests and their mixtures.

Broadleaf or deciduous forests consist predominantly of oak forests, which is then followed by linden(괴 나무?) forests, birch(벚 나무?) forests and aspen forests.

The subarctic coniferous forest zones are represented by various types of evergreen-deciduous mixed forests, evergreen and deciduous forests depending on their locations and natural successions of forest communities.

DPRK has relatively rich biological diversity compared to the size of its territory.

The main ecosystems of the country are i) temperate mountainous forest ecosystem; ii) alpine ecosystem; iii) wetland ecosystem; iv) freshwater(? inland water?) ecosystem; v) marine and coastal ecosystem, and vi) agricultural ecosystem.

The number of species recorded so far is: 8,785 species of plant, 1,431 species of vertebrates, which takes about 3.2% of the world number. The birds are 416 species and it takes 4.5% of the world species.

And the biodiversity of DPR Korea is characterized by its uniqueness and long history of existence. Among total vascular bundle plant species present in country, 315 species or 10% are endemic. Similarly, 41 species/sub-species or 2.9% of total vertebrates are endemic.

In addition, the country has regional and international significance in biodiversity for its 158 species of higher plant and 157 species of vertebrates identified as extinct, endangered and rare species. (NBSAP 1998).

## 5. Economy and Agriculture

As a socialist country DPR Korea is developing the national economy mainly relying on its own resources and technologies.

The economy of the country is characterized by three sectors, namely; 1) line industries including iron steel, chemical, cement, manufacturing, electricity, electronics, fishery and construction industries; 2) service sectors such as transport, communication, trade and finance businesses; and 3) the agriculture.

The GDP in 1990 was US\$ 20.875billion, but reduced by US\$ 12.802 billion in 1995 and US\$ 10.608 billion in 2000, respectively. Gradual improvement is shown afterwards, and the GDP in 2004 was US\$ 13.578 billion.

The country has limited arable lands, but the government is pursuing the policy to meet the food demand with self-production.

Of agricultural lands totalling 2,042,100 ha, the arable lands are 1,839,000 ha or 0.08ha per capita.

The arable lands consist of 574,000 ha of rice paddy fields, 1,005,000 ha of non-paddy fields, 144,000ha of fruit growing orchards and 85,000 ha of mulberry fields.

The ratio of agricultural lands by gradients are 82% at 0~15° , 15% at 15~30° and 3% at above 31° .

Due to a number of factors including repeated natural disasters in 1990s the land resources have been seriously degraded, reducing remarkably their agricultural productivity.

However, the crop production yields since then were reduced remarkably annually as a result of natural disasters and economic difficulties associated with external pressures, contributing to the aggravation of people's livelihood and economic development of the country.

The government has made effort to overcome these difficulties, with the focus on regaining and increasing the agricultural production. In this process, the agricultural production has reached to 5.45 million tons last year(2005).

However, it is still not enough to meet the national demand for food by its own crop production. Recently, the government is promoting the large-scale realignment and rezoning of arable lands and double cropping methods.

The agricultural ecosystems of the country is classified by 53 sub-areas under 7 eco-zones.

## 6. Culture and Populations

The population of the DPR Korea was estimated to be 20.096 million in 1990, 22.114 million in 1996, 22.754 million in 2002 and 23.612 million in 2004. The annual rate of population growth is about 1%.

According to population statistics, the blue and white collars accounted for 15.432 million or 67.8% and the cooperative farmer for 6.631 million or 29.1% of total population, respectively in 2002.

The DPR Korea has universal free medical care and free obligatory education systems. there is no illiteracy in the country.

And there is a pension and subsidiary system for the men of merit, aged and disabled people.

## 7. Main environmental issues

As common as in other developing countries, the environmental issues in DPR Korea are interrelated with population growth and socic-economic development, etc.

Major environmental concerns of the country have been triggered from the overexploitation of natural resources and environmental pollution and they are as follws;

### 1) Deforestation and forest degradation

Nearly 80% of the country's territory is covered by mountainous forests.

Therefore, the natural environment as well as social production and living environment of the people largely depend on the forest ecosystems and their products.

However, due to the repeated natural disasters and economic hardship in 1990s large proportion of the forest lands are destructed and degraded.

Of total 9 million ha of forest lands, about 1.5 million ha have been deforested, leading to the acceleratin of biodiversity loss, soil erosion and deterioration of hydrological dynamics as well as to the frequented natural disasters.

In conclusion, the deforestation and forest degradation have become the main causal factor tha affects negatively on the agricultural production and people's livelihood and changes other depedent ecosystems for the worse.

## **2) Land degradation**

Land degradation is also one of the main environmental concerns in the country. It is closely related with the specific natural conditions of mountainous areas, recent abnormal climate changes and steady population growth.

Unlike other environmental issues, the land degradation is not easy to recover once it occurred. The critical issue of land degradation in the country is the soil erosion which occurs directly through deforestation and unstable crop cultivation in sloping lands.

Currently, the soil erosion in sloping lands is about 40~60 tons/ha/year with maximum value of over 100 tons/ha/year.

In addition, the land degradation is occurred in various forms including degradation of rice paddy fields, waterlogging and loss of agricultural lands due to infrastructure construction, degradation through intensive monocropping, damage of coastal areas by tidal waves and so on.

They all diminish the productivity and regeneration capacities of ecosystems, leading to increased natural disasters.

## **3) Degradation of marine and coastal ecosystems**

Being surrounded by the seas on both sides, west and east, the DPR Korea has unique, nationally as well as globally significant marine and coastal ecosystems.

However, next to the increasing impacts by abnormal climate change, there are increasing development and exploitation activities on marine and coastal ecosystems which are associated with high population density and limited natural resources available.

Many of coastal areas including wetlands are exploited through human development activities including reclamation of tidelands for crop cultivation and salt farming, and marine and coastal products such as shellfishes, etc, have been largely harvested.

They inevitably have led to the rapid alteration of coastal ecosystems and reduction of coastal aquatic resources.

## **4) Loss of biological diversity**

Due to its geographical position, at the apex of the Korean peninsula linking the seas with continental land mass, the DPR Korea is endowed with high level of biological diversity

compared to the size of its territory and plays very important role in preservation of temperate biological diversity.

However, it experiences now rapid and accelerated reduction in biological diversity due to numerous factors including population growth, deforestation and habitat destruction, over exploitation, introduction of alien invasive species and pollution, etc.

The biodiversity loss at ecosystem level appears mainly in the form of deforestation, i.e. the destruction and fragmentation of habitats, and largely the degradation of marine and coastal ecosystems, freshwater and wetland ecosystems.

At species level, 10 critically endangered species, 42 threatened species, 76 rare species and 26 endemic species have been identified for higher plant, which take 4% of total higher plant species. Similarly, 9 critically endangered species, 29 threatened species, 119 rare species of vertebrates are recorded, equaling to about 11% of their total.

Although there are about 200 protected areas and protection forests of various kinds throughout the country, they are managed poorly reducing the efficiency of biodiversity conservation efforts.

### **5) Degradation of water quality**

The DPR Korea has an abundance of water resources.

But they are becoming to be degraded through various reasons including population growth, urbanization, industrial and infrastructure development and deforestation.

Water quality is also deteriorated through increased solid waste sedimentation.

### **6) Air pollution**

Air pollution is one of major environmental concerns in DPR Korea.

In industrial processes the air pollutants including sulphurous acid gas and aerosols are emitted exceeding their standard limits, causing air pollution. The low combustion efficiency of fossil fuels and the decreased energy conversion efficiency contribute also to the increased emission of carbon dioxide.

The deforestation and land use change are also another factors that reduce carbon sinks.

On the other hand, the yellow sand storm that occurs more frequently in Asia region has brought increasingly adverse environmental effects.



## **7) Solid waste**

The solid waste is a function of production activities and life process of human society. Currently, the lack of proper technical capacities for sound management system of solid wastes has the negative impacts on the hygienic and sanitary environment and the qualities of soil, water and air.

## **8) Natural disasters**

In DPR Korea, the natural disasters are closely related to the country's natural environmental conditions and the impacts of recent global climate change. The disasters are caused, in many cases, by droughts, floods and tidal waves.

Such natural disasters are further increased in their intensity and severeness through accelerated development activities such as deforestation and human induced rapid climate changes.

The cost of natural disasters amounted to millions to billions dollars, affecting on the economic development and people's livelihood of the country.

# **Section 3. Main issues of land degradation**

## **1. Causes and effects of land degradation**

The land degradation in DPR Korea is chiefly linked with forest destruction.

This section considers the land degradation in both main land use categories; i) degradation of forest land and ii) degradation of agricultural land.

Degradation of forest land occurs in the form of; reduction of forest land area; reduction of volumes and density of forest stands; reduction of vegetative covers; decline of soil organic matters, erosion and landslides, drying and reduction of water catchment capacities; soil compaction; and destruction of food chains, ec.

Degradation of agricultural lands occurs in the form of; reduction of arable land area; erosion; loss of soil nutrients, acidification and salinification; drying and reduction of water catchment capacities; waterlogging; soil compaction; and soil pollution, etc.

Such phenomenon of land degradation affect on; the decline of soil productivity; reduction of natural regeneration capacity of the soil; loss of biomass; decrease of water regulation functions; reduction of soil carbon sinks; and on the decline of social values of the land, etc.

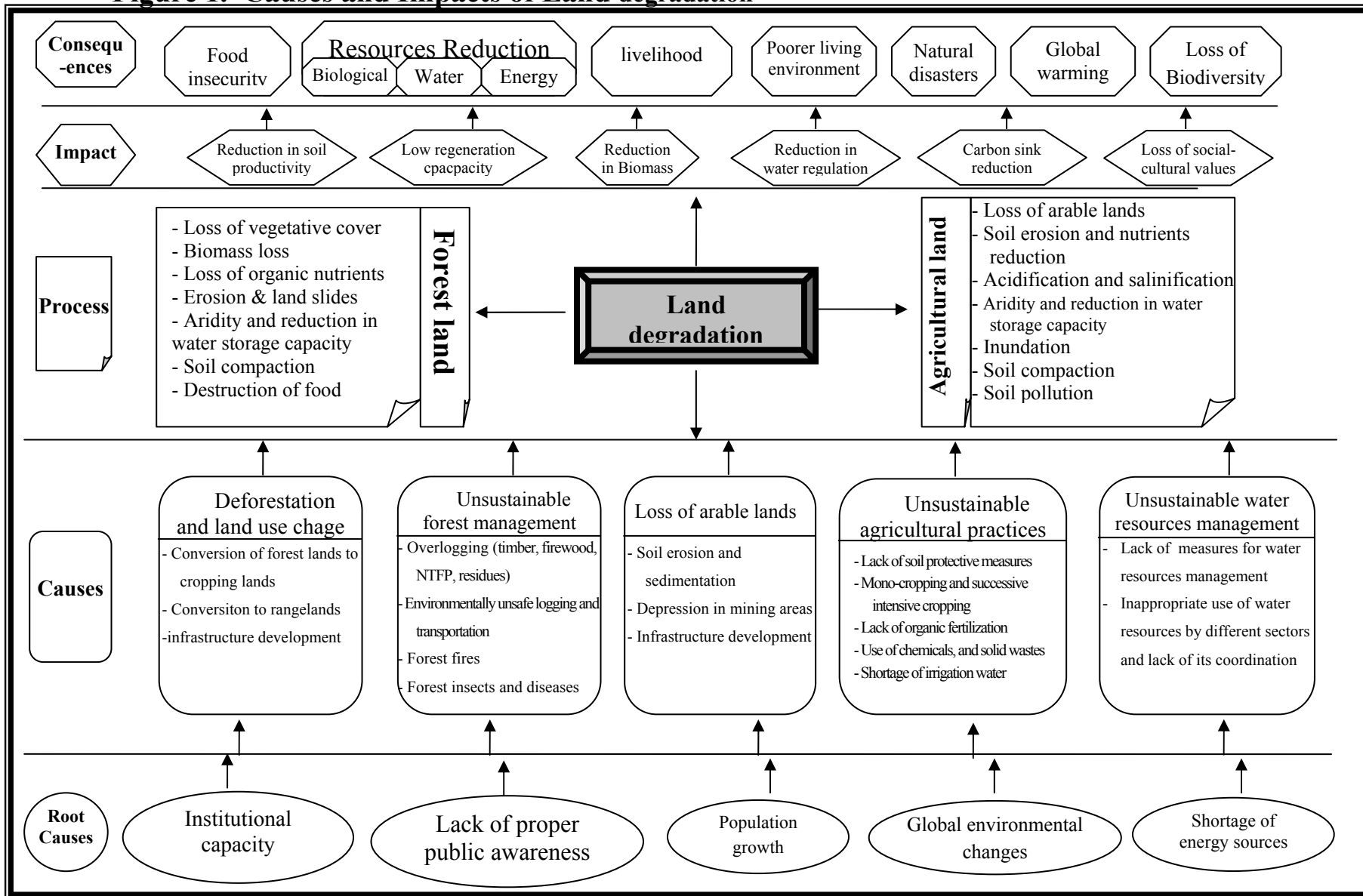
Their impacts, consequently, are resulted in unsafety of food production, reduction of natural resources including biological, water and energy resources, frequented occurrence of natural disasters, acceleration of global warming and biodiversity loss.

Hence, the land degradation is the last and ultimate stage of destruction and degradation of land ecosystems by jeopardizing the regeneration capacities of ecosystems and diminishing the ecological carrying capacities. It ultimately leads to the ecological crisis.

The main causes of land degradation include; deforestation and land use change; inappropriate forest management; loss of arable lands and unsustainable farming methods; and improper water resources mangagement. The unsustainable pasturage is also assumed to be one of the causal factors of forest land degradation, considering the specific condition of the country where the natural grasslands for pasture are quite limited.

The root causes of land degradation are considered to be; the capacity constraints; and contributing factors including population growth, shortage of energy sources, and global environmental changes.

**Figure 1. Causes and Impacts of Land degradation**



## 2. Deforestation and forest land degradation

The forest land area of the country is 8,927,300 ha or 72.5% of total land area.

The areas by forest land use categories are as follows; (2002)

Land use category	Area (ha)
Protected area/protection forests	953,500
Industrial timber production forests	5,090,200
Forests with economic values	1,181,600
Firewood forests	398,800
Grasslands	204,600
Non-woody forest land	876,800
Non-forested land	407,300

Forest land area by category of species composition are as follows;

Evergreen(coniferous) forests	41.9%
Deciduous forests	35.6%
Evergreen-deciduous mixed forests	22.5%

In the country the forest plays the crucial role through its eco-environmental functioning and provision of forest products.

However, the forest degradation, in particular the deforestation, has become a serious concern since 1990s when the country experienced the repeated natural disasters and economic difficulties due to external pressures. The activities to convert forest lands for crop cultivation, forest logging and extraction of forest products have been proceeded on large scale.

As a result, the non-forested lands were increased from 361,000 ha in 1993 to 1.5 million ha in late 1990s, 360,000 ha of forest lands were lost through conversion, the average volume of woody forests per ha have been reduced by 57.3 m<sup>3</sup> through over-harvest of firewood and timber, and valuable medicinal and edible plant resources are reduced remarkably through over-collection.

And above 30% of nurseries have been damaged through increased soil erosion, landslides and sedimentation, causing difficulties in implementation of reforestation schemes.

On the other hand, the overlogging without keeping cyclic felling methods in industrial timber production forests leads to decrease in volumes of forest stands.

This process of deforestation causes soil erosion and sedimentation which, in turn, lead to frequent occurrence of natural disasters, degradation of agricultural lands and increased loss of biological diversity.

The deforestation and forest land degradation thus become the major issues of land degradation in the country.

### 3. Degradation of agricultural land (including rangeland)

Due to geographical condition that approximately 80% of its territory is occupied by mountains, the country has very limited land resources suitable for agricultural production.

Total agricultural lands are 2,042,100 ha or 16.6% of terrestrial land area. Of them, 1,839,000 ha are arable lands and the remaining are non-arable lands. Thus the actual land area available for agricultural production covers only 15% of the land total which equals to 0.08ha of arable land per capita in the country.

Below shows the areal distribution of agricultural land by its use type. (2004)

Rice (paddy) field	574,000 ha
Non-paddy field	1,005,000 ha
Fruit orchard	144,000 ha
Mulberry field	85,000 ha

The proportion of arable lands by gradient are; 82% between  $0^{\circ} \sim 15^{\circ}$  , 15% between  $15^{\circ} \sim 30^{\circ}$  , and 3% above  $31^{\circ}$  .

The loss of soil by erosion in sloping lands amounts on average to 40~60 tons/ha per year, but in severe cases it exceeds at maximum 100 tons/ha per year.

In sloping cultivation areas, the area of the non-paddy fields with less than 20 cm of soil layer has been expanded and the crop yields from those fields reduced by 25%.

On the other hand, there is now also severe degradation in tideland-origin rice (paddy) field area.

The tideland rice field has originally low nutrient contents and is further losing silicon contents through continuous cultivation over 50 years, leading to reduction of the grain yields.

The degradation of agricultural land occurs also due to construction of reservoirs, roads and river dykes.

Tens of thousands paddy fields are affected or lost by waterlogging and infrastructure development leading to the decline of crop productivity.

The country has no traditional rangelands, but some area of forest lands have been converted to grazing lands totalling upto 204,600 ha.

However, the lack of sustainable grazing methods and practices eventually leads to some extend to the decline of ecological carrying capacity of rangelands.

#### 4. Climate change and water resources

Attributable to the sufficient amount of annual precipitation and the well-development of the medium and small sized watercourses, the country has plenty of water resources.

The problem, however, is the big seasonal disproportion of annual precipitation and evapotranspiration which increase the vulnerability to droughts and floods.

Especially, during the season between April-June, the important initial stage of vegetation growing, usually the minimum amounts of precipitation are recorded, affecting negatively on the agricultural production.

Furthermore, it is noteworthy to say that the recent global climate change has a growing impact on the deterioration of hydrometeorological dynamics of the country.

This impact is evidenced by universal increase of temperature and decline of annual precipitations as well as by growing deviation of seasonal distribution of precipitation.

The recent 10 year mean temperature is estimated to be increased by 9% (0.8°C) compared to 80 year mean temperature (1921~2000) and the mean annual precipitation reduced by 89% during the same period.

And the seasonal distribution of precipitation on the average of 30 years (1971~2000) are recorded to be 17% in spring, 50% in summer, 23% in autumn and 10% in winter, with exceptional few years when the summer precipitation reached even up to 60 to 70% of annual precipitation.

Through the rise of temperature and decrease of precipitation, the drought index and water resources were reduced 5% and 20%, respectively, between 1971~2000 compared to those between 1951~1980.

On the contrary, the use of water resources was increased in the same period, with the uprise of 27% for household waters, 35% for industrial waters and 16% for agricultural waters, respectively.

## 5. Natural disasters

The land degradation is also caused and accelerated by natural disasters associated with destruction of forest ecosystems and worldwide climate change phenomenon.

We still remember the natural disaster by flooding of whole Pyongyang City and Taedong River basin areas due to heavy rainfall of 400mm per hour in upstream river area in August 1967.

During last decade, the frequency and intensity of natural disasters such as floods, droughts and tidal waves have been scaled up, causing severe damages to the agricultural and forest land resources.

Through the successive floods in 1995 and 1996, 1.3 million ha of agricultural lands were damaged and lost by inundation and sedimentation. It brought about the cost of US\$ 1.038 billion in agricultural sector in 1995 and US\$ 2.271 billion in whole economic sectors 1996, respectively. In addition, the drought in 1995 devastated about 466,000 ha of arable lands.

As said above, the land degradation is nationwide phenomenon. It directly causes the reduction of agricultural productivity and regeneration capacities of biological resources, and has the severe and adverse impacts on the livelihood improvement and sustainable development in rural areas.

## Chapter 2. Policy/legislations; Institutional system and Existing activities related to land management

### Section 1. Major land management policies

The great leader Comrade **Kim Jong Il** said **“What is important in land management is to conserve land properly. This can prevent the loss of land and ensure the effective use of it down through the generations”** (“**Kim Jong Il Selected Works**” Volume 8. 151 p.)

Considering the growing concerns of land degradation and the specific condition of the country, the government set the policy to preserve and effective use the land resources.

Key aspects of the government's land management policy are as follows;

1) To prepare land development master plan and carry out the development activities of land and natural resources prospectively based on it. The main principles in preparing land development master plan are:

- to not allow in land and natural resources development the encroachment on farm lands and secure their preservation;
- to refrain from enlarging cities excessively and ensure the distributional small-scale urban development to suit to the living environment of human beings.
- to take into consideration the climatic and soil features of specific different areas,
- to take in advance the measures for preventing pollution, and
- to take into consideration the economic development perspectives at national and local levels.

The land development master plan should also reflect other issues in detail, for example; the issues related to readjustment, improvement and protection of land resources; reclamation of new arable lands; approaches to reforestation/afforestation and protection of forests; measures to protect valuable animal and plant species; construction and improvement of rivers, streams and reservoirs; allocation of flood control facilities; designing and construction of cities, villages and recreational areas; approaches to integrated development of marine and coastal areas; and so on.

2) To continually increase the area of cultivated land while avoiding the encroachment on existing farmland, and to complement the irrigation system for agricultural production at higher level.

Under the condition that there is very limited arable land resources compared to ever-growing population, it is essential for the country to care and preserve the existing agricultural lands.

Under the wise leadership of the President Comrade Kim Il Sung and dear leader Comrade Kim Jong Il, there were a number of measures taken and the state's investment increased for the expansion of agricultural land area through reclamation of tidal lands, exploration of potential sloping and vacant lands, based on the principles to preserve, as far as possible, the existing arable lands from all kinds of construction and natural resources development activities, and, if unavoidable, to obtain other land area as a substitute for the lost arable land.

Considering that the rice farming takes dominant proportion in the agriculture and is prone to the drought impact, the government has launched large scale irrigation projects to ensure safe



water supply to all rice fields, and also taken other measures for irrigating even dry fields including introduction of sprinkling irrigation system in vegetable gardens.

During last years, for example, the natural-flowing waterways construction projects between Kaecheon-Taesong Lake and Paekma-Cholsan have been implemented, and numerous wells and water ponds were dugged around the fields to catch water for irrigation.

3) To improve the management of mountains and rivers as an important means of securing the safe agricultural production.

The land management in the DPR Korea has traditionally close relationship with the management of mountains and rivers, with a long history started when the great leader Comrade Kim Il Sung planted a tree on Munsu Hill and broke the land at the site of the River Potong development project.

The main objective of government's policy of mountains and river management is; to protect and manage the mountainous forests in rational way including the reforestation and rehabilitation of degraded forests; to improve river embankment and management of watercourses in order to prevent and mitigate the disasters by droughts and floods.

It includes also; the promotion of activities of planting trees in mountains and forests; building the physical structures to prevent soil loss and landslides; and other land protection measures, with the aim to safeguard the human lives and their properties and promote the economic development of the country.

To this end, the government has taken measures to strengthen the public campaign for tree planting in forestlands, to distribute the management responsibilities of medium- and small sized rivers and streams among different use sectors including factories and cooperative farms, while the larger ones be managed by relevant land management authorities.

4) To improve the livelihood and promote the economic development in rural mountainous areas through integrated management of mountain resources.

The key aspects of this policy is to make effective manage and use of mountains not only as a timber production base but also as a comprehensive base for livestock breeding, sericulture and other resources production for rural economy.

The integrated management of mountains is one of the main options of rural development in the country which has dominant part of mountainous areas and less arable level lands.

Therefore, the government has paid great attention to the integrated management of mountain areas and development of related technologies.

To implement this policy, various activities such as establishment of timber production forest, oil plants forest, mulberry and fruit plantations have been carried out, contributing to the improved living condition and income growing of rural peoples.

5) To protect the land from pollution and increase the effectiveness of land use

The measures to protect the land resources from pollution caused by hazardous gas emissions, waste effluents from factories, lean ores, mucks and waste waters from mining industries, include the principles of installing dust and gas collection and purification processes/facilities and safe dumping ponds and deposit areas for mucks and lean ores, refilling of mining pithols to prevent the depression and so on.

6) To promote the broad participation and partnership in protection and management of land resources.

The great leader President Kim Il Sung said “the protection and careful management of land is the honourable duty of all people including farmers and governmental organs. All the people, and especially the farmers, should take part with a sense of ownership and responsibility in the protection, development and management of land resources”.

In line with this policy, the government has taken measures including; the promotion of education and awareness on patriotism and land caring among public mass; the organization of public campaign for land protection activities on the relevant and important occasions; distribution of responsibilities for protective management and use of land resources among public organs, factories and cooperative organizations; encouragement of voluntary participation of the public, including youth and women, in the land protection management works.

## **Section 2. Legislations related to land management**

The above government policies related land management are reflected in various laws and regulations. The representative main laws and regulations are as follows;

1) DPRK Land Law

The DPRK Land Law was elaborated personally by Great Leader Comrade Kim Il Sung and adopted on April 29, 1977 by Supreme Peoples Assembly. The law specifies the provisions on land tenure, land development master planning, land protection and development as well as on the management and supervision of land resources.

The law stipulates a number of provisions regarding the protection, management and use of land resources, in particular, it specifies on; survey and inventory of forest resources, rivers and streams; their management and procedures of their development; land protection against environmental pollutions; completion of irrigation system in agriculture; the general principles and procedures in development and use of land resources including road and industrial constructions and settlement area development; integration of land development and protection into land development master plan and; public participation in land management activities.

2) The DPRK Environmental Protection Law was adopted on April 9, 1986 in Ordinance No.5 of Supreme People's Assembly.

The law specifies on the basic principles of environmental protection, preservation and promotion of natural environment, environmental pollution and its control measures.

3) The DPRK Land Development Planning Law was adopted on March 27, 2002 in Ordinance No. 12 of Supreme People's Assembly

Based on the definition that land development plan is an integrated, comprehensive and prospective plan aiming at managing the land and environmental resources in a strategic way, the law describes about the provisions on the principles of land planning procedures and methodologies. The law stipulated that the land development planning/activities should take into consideration the following principles of, namely, the preservation of existing arable land resources; promotion of reforestation and stream/river management to protect the land resources; avoidance of development of oversized urban areas; consideration of local specific climate and natural conditions and; the prevention and improved management of environmental damages.

4) The DPRK Forest Law was adopted on December 11, 1992 in Ordinance No. 9 of Supreme People's Assembly.

The forest law provides general regulations on forest resources management comprising definition of forest land resources, reforestation/afforestation, protection and use of forest land resources.

In the law, the forest lands are classified into five forest types, e.g, the special protection forests, common protected forests, timber production forests, forests with economic value and firewood forests. The law stipulates that the forest lands should be managed based on forest development master plan and according to each classified forest types, the public participation should be encouraged in reforestation and forest protection activities and etc.

5) The DPRK Law on Agriculture was adopted on December 18, 1998 in Decree No. 290 of Standing Committee of Supreme People's Assembly.

The agricultural law has the provisions on the diversified development of agriculture, completion of irrigation system and its management, protection of agricultural lands against natural disasters and on the prevention of land degradation.

6) The DPRK Water Resources Law and Law on Rivers and Streams

The water resources law was adopted on June 18, 1997 in Resolution No. 86 of Standing Committee of Supreme People's Assembly and the law on rivers and stream adopted on November 27, 2002 in Decree No. 3436 of Standing Committee of Supreme People's Assembly, respectively.

Water resources law deals with the survey, development, conservation and use of water resources, in particular, includes provisions that water resources should be preserved through nationwide and public involvement, the good quality and enough quantity of water resources should be conserved to make effective use for human life without any loss of them.

The river and stream law classifies the rivers and streams of the country into large-, medium- and small sized ones, stipulates regulations on river treatment, procedures and methodologies of river management. It addresses the following issues such as; the construction, conservation, embankment and use of centrally and locally managed rivers and streams, the distribution system of responsibilities for managing rivers, identification of flood prone areas and urban and agricultural land protection projects to improve the water management in those areas, etc.

In addition, other laws including land lease law, city management law, road law, underground resources law, etc, have also been enacted to contribute legally to the sustainable land management.

On the other hand, the land management policies of the country are also reflected in the presidential orders.

The Presidential Order No. 1 entitled “on the reinforcement of the nature conservation activities” dated July 26, 1973, put emphasis on the following issues; the preservation and improved management of forest resources through public participation; the construction and management of rivers and streams for safeguarding the land resources; proper selection of nature reserves, animal reserves, plant reserves, sea-bird reserves and marine resources protected areas in order to conserve the animal and plant resources; reinforcement of scientific researches and studies related to nature conservation of the country and; strengthening of awareness raising to promote the public participation in nature conservation activities.

Another one was the “Rules on protection and proliferation of marine resources” issued by Presidential Order No. 7 on October 24 1976.

It specifies the regulations on; controlling and checking the release of waste mucks from coal and mineral mining into rivers and seas; the protection of rivers and seas from pollution by various toxic substances and; prohibition of uncontrolled extraction of aquatic resources from rivers and seas.

There are also others including the order on reinventory and proper management of land areas.

### **Section 3. The recent land management policies and activities to address the land degradation**

As having significant adverse impacts on the agricultural production and the living environment of the people, the deforestation of forests and degradation of agricultural lands have become one of the main barriers to the sustainable development of economy and society of the country.

Entering new millennium, the government has taken decisive measures to reverse the land degradation, especially the deforestation.

Following the instruction of Great leader Comrade Kim Jong Il on “ bringing about new turn in the land management”, the resolution to promote land management activities through turn-out of all nation was adopted in September 1996 jointly by party, people’s committee and government, providing new milestone in addressing the land degradation and promoting the improved land management.

As an implementation measure of this resolution, the government launched nationwide land management campaign by setting up General Turn-out Month for Land Management in each spring and autumn to promote the reforestation and rehabilitation works of degraded forests, realignment of land resources, river banks management and other land management works through participation at all levels and sectors.

As a result, the annual reforested area reached to 130 thousand ha, tens of thousands paddy and non-paddy fields were realigned at regular scales, and long lines of river banks were repaired.

In particular, considering the limited land areas available for crop cultivation and trends of modern agricultural development, the government initiated the land readjustment projects and implemented them step by step, covering major provinces of agricultural production, thus obtained additional new rice cultivation areas through standardisation of irregular rice fields.

A number of medium- and small sized rivers and streams such as Dokji River, Ryonghung River, Jangyon-namdae creek, and others that meander the cultivation areas of South Hwanghae Province, North and South Pyongan provinces and South Hwanghe Province, were improved thorough embankment and dredging works, reducing the threats of floods.

In addition to the promotion of constructing reservoirs as many as possible, the natural style Paekma-Cholsan waterway project was undertaken following the completion of Kaechon-Taesong Lake waterway project to provide sufficient irrigation water supply to the agricultural lands including newly reclaimed tideland rice fields.

All these government measures and their implementation activities undertaken with public participation have contributed to further progress of combating land degradation.

#### **Section 4. Institutional system for land management**

The policies and legislations related to land management are implemented by both supervisory/coordinating authorities and user sectors.

The Ministry of Land and Environment Protection (MLEP) is a government authority responsible for the supervision and coordinated management on land and environmental assets of the country, and was established in 1961.

It has relevant departments such as Land Supervision Department, Land Use Planning Department, Forest Department, Road Management Department and River and Stream Management Department to monitor and control the overall land use patterns of the country. It has established nationwide institutional system for land and environmental protection from central to provincial and local levels. In particular, there are the land resources controlling bodies, forest resources controlling bodies and forest management units established under the Department of Land and Environment Protection at city and county levels.

There are also scientific and technical institutions under the MLEP including Land Development Planning Institute, Central Forest Design Technical Institute and Environmental Protection Institute, and at provincial level, the land use planning institutes, forest design institutes and so on. They conduct researches and surveys and make recommendations to decision makers related to development of land use master plan, forest development master plan, forest management design and land protection management issues etc.

The Ministry of Agriculture(MoA) is responsible for the management and use of agricultural lands of the country.

It has its subsidiary bodies like in provincial level, Rural Management Committee, in county and city level, Cooperative Farm Management Committee and in Ri(last administrative division)level there are cooperative farms and so all agricultural lands are managed and utilized in collective way according to the socialist principles.

The Academy of Agricultural Sciences is responsible for scientific and technical issues related to the protection and management, and effective use of the agricultural land resources and it has also its branch academies in each provinces.

The ministry of Timber Industry manages and uses 5 million hectares of forest land for industrial timber logging and is in charge of the timber production and forest management in this area. It has also in some important provinces its timber production managing administrations and forest design institutes.

The scientific research and survey related to the land resources are also conducted by the Institute of Geography and Remote Sensing and Satellite Information Institute under the State Academy of Sciences.

The educational institutions related to land management include the Faculty of Global Environmental Sciences, and Faculty of Life Sciences at the Kim Il Sung University as well as

agricultural colleges in each provinces. Pyhyon Land Management College also serves as educational base to train managerial and scientific experts in the field of land management.

As a NGO-type social organization, the Korea Nature Conservation Union(KNCU) has relevant associations such as Land Protection Association, Forest Protection Association and Water Conservation Association, all of which play important role in awareness raising and technical extension activities related to protection and management of land resources.

## **Section 5. Constraints and gaps in current land management**

### **- Weakness in databases and information sharing related to land management.**

One of the critical issues is the incompleteness of comprehensive database related to land use and degradation. Currently there are some data bases established seperately by few sectors, but, even so, their scientific and technical abilities are not enough, and there is the lack the exchange and sharing of information between them.

It is necessary to identify criteria and indicators to assess the land degradation and to establish integrated information database related to land resources management and degradation through technical capacity strengthening, and further to strengthen the exchange of informations among relevant stakeholder agencies.

### **- Creation of enabling environment to implement the sustainable land management**

It is important to improve the legislations according to the changing situations in order to achieve the sustainable development and better livelihood of the people in the country.

Recent decades around the new millennium, with the increasing critical environmental concerns such as desertification and land degradation and global efforts to reverse them, new concepts, advanced technologies and approaches to sustainable land management including watershed management and ecosystem approach are developed and applied to the practice at the global level. It requires the revision and update of existing legislations and practical guidelines by replacing their provisions on old management approaches and technologies with advanced ones and, if necessary, by producing new laws, regulations and guidelines, to provide enabling climate for effective prevention of land degradation and promotion of sustainable land management.

It is also important to develop and implementation the national action plan for sustainable land management, improve and strengthen the existing institutional infrastructure and



capacities as well as the collaboration and coordination within and between land management and use sectors.

Currently, there are weakness in collaboration and coordination among land management and relevant other sectors, resulting in low efficiency in land protection efforts.

- **Lack of proper awareness and knowledge of the public including relevant stakeholders on land degradation and sustainable land amangement.**

In combating land degradation, there is a need to have clear perception and understanding about the values and importance of land resoures. And, based on the knowledge of what are the causes and consequences of land degradation, the land degradation issues can be addressed properly.

Although the existing educational institutions related to land management deal with the scientific and technical as well as managerial, practical issues, there are often gaps in their training contents, revealing constraints in introduction and application of new concepts and technologies.

On the other hand, the lack of advanced knowledge and techniques on land degradation and sustainable approaches to land management among staffs and employees active in land management and use sectors has become another constraint to sustainable and effective management and use of land resources. Compared to the exerted efforts of the government to prevent land degradation with public participation, the lack of necessary knowledge and skills on advanced technologies and methods for combating land degradation and sustainable land management makes the intervention to land management less efficient.

There is also to note that the public awareness raising and propaganda through media such as newspapers, broadcasting, TV and publications would play important role if necessary funds and other resources are provided for these activities.

- **Insufficiency of financial resources and low technical capacities**

The economic stagnancy coupled with frequented natural disasters over last decade had significant adverse impacts on the economic development and livelihood of the country, creating difficulties in provision of financial budgets necessary for the smooth and sustainable development by sectors including land management and use sectors.

Limited access to the advanced technologies and investment are also another challenges.

- **Natural geographical conditions and impacts of climate changes also are vulnerable factors causing land degradation**

The geographical and climatic conditions of the country are the natural factors driving to land degradation.

The prevailing proportion of mountainous areas with steep slopes and hydrological cycles relying on it, distorted seasonal variation of annual precipitation with heavy rainfalls during wet season, July-August, are the vulnerable natural factors to the land degradation including soil erosion, land slides and flooding.

The rapid climate change and global warming effects contributed to the increase of mean temperature upto 1 °C on average and frequent occurrence of natural disasters including droughts and floods, accelerating the land degradation process.

Thus, the response measures to combat land degradation and achieve the sustainable land management should take careful consideration on these vulnerable geographic and climatic conditions.

## Chapter 3. National Action Plan (NAP) to Combat Land Degradation

### **Section 1. Participatory Approach in Preparation of the NAP**

The preparation of the national action plan to address land degradation was started from June 2005.

The initial national awareness workshop on CCD implementation and NAP preparation was held between June 15 -16, 2005 in Pyongyang with the support from UNCCD secretariat, involving representatives from various government agencies, scientific and public organizations

Preceding this event, 2 senior officers from the government agency had participated and received training in the regional workshop on GEF activities related to combating desertification/land degradation held during 19-21 January 2005.

For the preparation of initial national awareness workshop, a preparatory working group was organized to collect, analyse the data on status of land degradation and national policies/activities to address it.

The awareness workshop has contributed to the awareness raising among stakeholder agencies on the concepts, issues and international activities of combating land degradation and the national obligations to UNCCD, and also provided opportunity to share and exchange the views about the options and ways to sustainable land management.

In the workshop the participants agreed upon the organization of NAP preparation working group involving expert representatives from relevant government agencies and scientific institutions and the scheduled workplan for NAP preparation.

Through the activities including information gathering and analysis, frequent consultations and group discussions, and two internal workshops, the NAP preparation working group has reviewed the status of land degradation, identified its main issues, causes and constraints and, based on them, prepared the draft NAP.

The preparation of NAP to combat the land degradation was proceeded in close collaboration with the National Capacity Needs Self-Assessment(NCSA) project, especially with the land degradation working group of the project.

The participation of government representatives in the 7<sup>th</sup> Conference of the Parties(COP) to UNCCD held in Nairobi (September 15-28) and the close collaboration with the regional

coordinating unit of CCD Secretariat have become another catalytic factors for further revising the NAP draft.

The final NAP validation workshop was convened in June 15-17, 2006 in Pyongyang.

The list of NAP preparation working group members and relevant stakeholder agencies involved in the process of NAP preparation are attached to the end of this document.

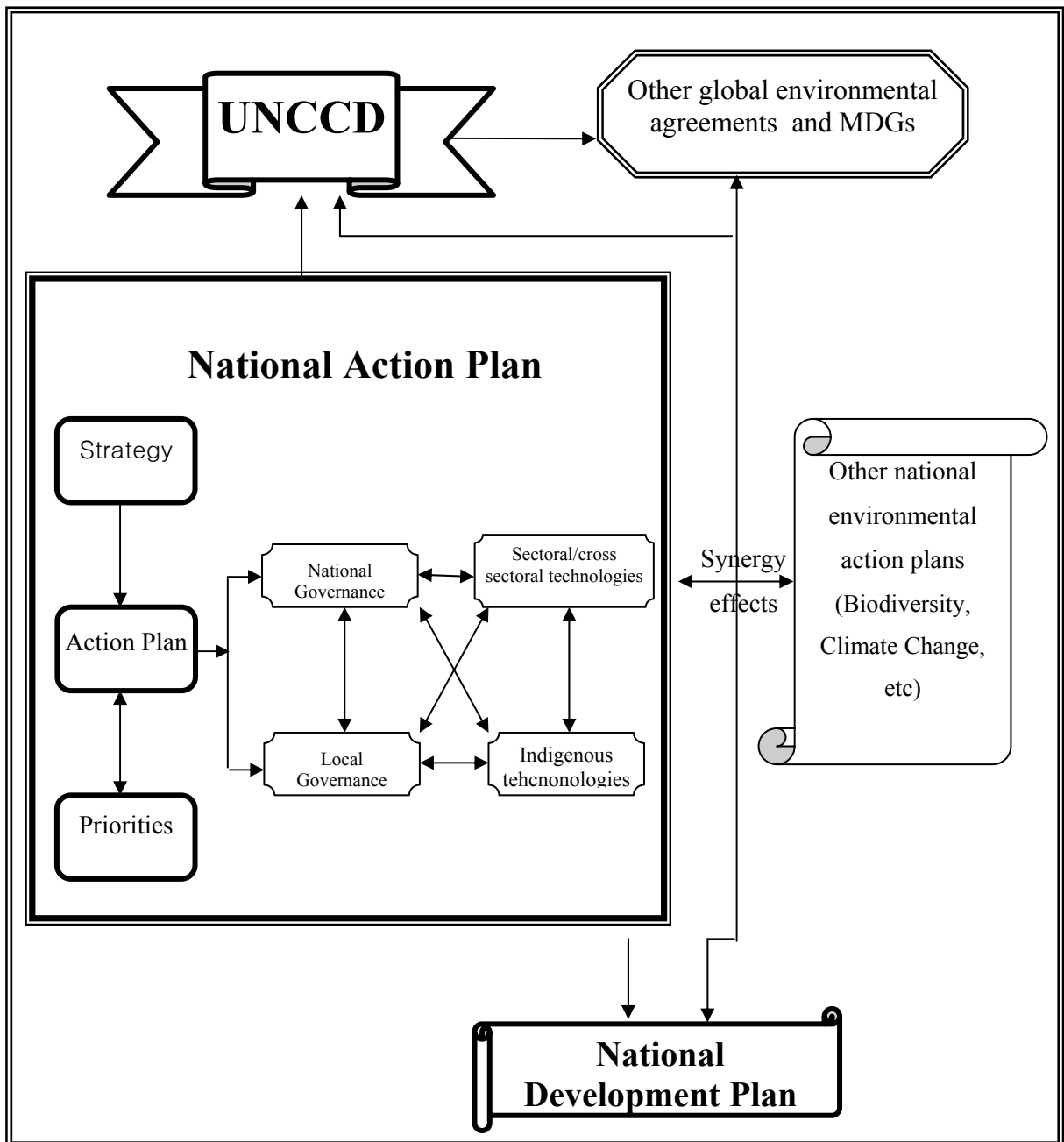


Figure 2. National Action Plan to combat land degradation and its relationship

## **Section 2. Goals, programmes and Activities**

The National Action Programme consists of strategy, programme and activities.

In development of strategy which aims to realize sustainable land management with mitigating land degradation, more attention is paid on keeping principle of eradicating major causes of land degradation than rehabilitation of existing status of land degradation.

In this respect, main concern could be measures of both mitigation of degradation in major land use and sustainable land management.

As the main causes of land degradation are related to human activities and sustainable land management can be achieved by improved human activities, effective participation of people is considered as main solution.

On the other hand, integrated approach which includes biophysical conditions, and socio-economic as well as institutional capacity is an important principle in preparation of the strategy. It covers all the factors which influence on land degradation and resources mobilization.

Under these considerations, to achieve the vision for mitigating land degradation which is considered here, it is very important to develop institutional capacity to address land degradation at national and local level, test and identify possible measures and methodologies and improve enabling environment in short span of time, before large scale activities for sustainable land and water management is immediately launched.

### **1. Strategic goals**

In DPRK, the socialist prosperous and powerful country building line will be carried out and the sustainable development realized and, accordingly, all the activities will direct towards enhancement of effectiveness of sustainable land management and natural resources use, which contribute to meeting the needs for socio-economic development in appropriate level.

For this goal, scientific-technological capacity will be fully developed for land and natural resources management and practical activities implemented in cooperation and partnership between relevant sectors.

Priorities are set in achieving following targets.

A: Planning and implementation for sustainable and rational land use management which provide balance between forestry-agriculture (including animal husbandry)-water resources.

B: Increased participation in the improvement of ecological, economic and social values of land resources.

C: Organic combination of rehabilitation activities of degraded land and sustainable rural development

D: Capacity building to address land degradation and sustainable land management

## 2. Targeted Indicators

- Rehabilitation and maintenance of 700,000ha of degraded forest land by reforestation and assistance regeneration activities.

- Sustainable management of 2 mil. Ha of industrial forests including rehabilitation of 500,000 ha of degraded forests.

- Improvement of management of 200,000 ha of coop farm forest.

- Introduction of forests with economic value and agro-forestry in 340,000 ha of sloping lands

- Introduction and extension of sustainable sylvo-pastoral practices into 200,000 ha of forest land.

- Introduction of conservation farming in 280.000 ha of sloping agricultural land.

- Establishment and management of agricultural protection forests/wind break belts in 1Mil. Ha of arable land.

- Improvement of soil fertility through introduction of organic farming in 350,000 ha of degraded rain-fed fields and 210,000 ha of paddy fields

- Improvement of 60,000 ha of paddy field management which is influenced by water logging.

## 3. Immediate targets (2006-2010)

The immediate targets are to strengthen capacity to achieve strategic goal and to enhance the effectiveness of practices for rehabilitation of degraded land through active transfer of technology and extension, which will be implemented with keen linkage to food security, improvement of forest products supply including fuel wood, and enhancement of people's livelihood in rural areas.

Purposes are:

1) Establish basic for integrated and sustainable land management through capacity building activities in both central and local levels.

2) Decisively enhance the effectiveness of practices for rehabilitation of degraded land and sustainable land management through active transfer and extension of technology.

Indicators are:

- Enhanced public awareness and development human resources.
- Formulation and implementation of land management strategy and action plan in close relation with UNCBD and UNFCCC and mainstreaming into national development plans.
- Basis for land use assessment, planning and monitoring by application of GIS technology.
- Assessment of ecosystem vulnerability, early warning system for mitigating flood and drought damage and development of preparedness plan.
- Improved policies and legislation for sustainable land and water resources management.
- Improved capacity of land management in local, especially land use and management level.
- Transfer and extension of watershed management technology.
- Development and application of forest rehabilitation technology in purposes of resolving rural energy and improving forest products supply, and demonstration of sustainable forest management.
- Promotion of agro-forestry and sylvo-pastoral technology and land protection in slopping lands.
- Introduction of organic-farming and demonstration of establishment of agriculture protection forests (including wind break belts)
- Development of rehabilitation of degraded paddy fields in reclaimed tide lands.
- Application of mitigation technology of water-logging damage.

#### 4. Programmes, Objectives and Activities

The NAP, which covers goals to realize sustainable land management with combating land degradation, consists of some programme areas and relevant activities.

<b>Programme</b>	<b>Implementation period</b>	<b>Relevant agencies (estimated budget)</b>

		US\$)
<b>1 . Capacity Building</b>		
Programme 1. Capacity buildings for sustainable land management in national level		
Objective 1.1 Public awareness rising, training and education		
Activities 1.1.1 Development and implementation of public awareness rising programme	2006-2010	MLEP MOA MOFI ME (650,000)
Activities 1.1.2 Assessment and improvement of curriculum and training scale related to land management in relevant universities	2006-2010	
Activities 1.1.3 Establishment and operation of national short-training course for land management staff and technicians	2007-2010	
Objective 1.2 Establishment of land use data base and information exchange based on land degradation assessment and GIS technology		
Activity 1.2.1 Development of standardized criteria for land degradation assessment	2006-2007	MLEP SAOS (950,000)
Activity 1.2.2 Assessment of land use and land use change by GIS technology	2008-2010	
Activity 1.2.3 Land use reporting and dissemination of land management information	2009-2010	
Objective 1.3 Building enabling environment for sustainable land management		
Activity 1.3.1 Development of national strategy and action plan for sustainable land management	2006-2008	NCCE, Stat Planning Commision, MLEP, MOA (450,000)
Activity 1.3.2 Linkage of land degradation issues with MEA and mainstreaming into national development programme/plan	2006-2010	
Activity 1.3.3 Strengthening cross-sectoral coordination in land management	2006-2010	
Activity 1.3.4 Improvement of land management legislation	2006-2010	
Objective 1.4 Strengthening scientific research to combat land degradation		
Activity 1.4.1 Capacity building of soil research of Academy of Agricultural Sciences and Academy of Forest Sciences	2006-2008	AOAS MLEP SAOS (800,00)
Activity 1.4.2 Development of participatory rapid rural assessment and other tools for combating land degradation and sustainable rural development	2007-2009	



Activity 1.4.3 Development of multi-disciplinary research in combating land degradation	2008-2010	
Activity 1.4.4 Development of prevention of degradation and rehabilitation technology of paddy fields in reclaimed tide lands	2008-2010	
Activity 1.4.5 Mapping of real time water logging and development of assessment system of soil erosion and sedimentation based on GIS technology	2008-2010	
Objective1.5 Active participation in international cooperation in combating land degradation		
Activity1.5.1 Capacity building for project development, implementation and monitoring among staff of national focal point and secretariat of UNCCD	2006-2007	NCCE MLEP (300,000)
Activity1.5.2 Implementation of national obligation to UNCCD	2006-2010	
Activity1.5.3 Active participation in RAAP and SRAP	2006-2010	
Programme 2 Capacity building for sustainable land management in local level		
Objective2.1 Capacity building of land management in County Cooperative Farm Management Committee		
Activity2.1.1 Institutionalizing planning, implementing and monitoring for sustainable land management in the level of co-op farm or working group	2006-2008	Authority of selected priority areas MOA (950,000)
Activity2.1.2 Modernization of technical extension office of co-op farm and enhancement of it's role	2007-2010	
Activity2.1.3 Capacity building of integrated land management for cropping animal husbandry and forestry in co-op farm	2008-2010	
Objective2.2 Capacity building of district forest management board		
Activity2.2.1 Capacity building for forest resources survey and assessment and monitoring over it's change in district forest management board/station	2006-2008	MLEP Selected district forest management board (800,000)
Activity2.2.2 Development and implementation of 10 years plan of district for sustainable forest management	2007-2010	
Activity2.2.3 Development of incentives for participatory forest	2008-2010	

management and capacity building for organization of community forestry		
Activity2.2.4 Establishment and operation of technical Extension Office of District forest management board	2008-2010	
Activity2.2.5 Enhancement of enforcement capacity of forest legislation	2007-2010	
Objective2.3 Capacity building for forest management in Industrial forest management board		
Activity2.3.1 Assessment of forest resources and planning of rotational cutting	2006-2010	Selected Industrial forest management boards Authorities of selected districts (850,000)
Activity2.3.2 Establishment and operation of technical Extension Office in Industrial forest management board	2006-2010	
Activity2.3.3 Human resources development for forest ranger	2006-2010	
Activity 2.3.4 Monitoring on implementation of forest management plan	2006-2010	
<b>II . Technical transfer and extension of sustainable land management in sectoral and cross-sectoral level</b>		
Programme3. Technological transfer and extension for rehabilitation of degraded forests and reforestation for fuel wood		
Objective3.1 Assessment of degradation forest land and options of their rehabilitation technology		
Activity 3.1.1 Assessment of degraded forest land	2006-2008	MLEP (350,000)
Activity 3.1.2 Analysis and review of existing reforestation activities	2006-2008	
Activity 3.1.3 Development of recommendation for options of forest rehabilitation technologies	2007-2008	
Objective 3.2 Rehabilitation technology of degraded forest land by artificial tree planting		
Activity 3.2.1 Eco-climatological classification of territorial areas and deciding tree species to be promoted	2006-2008	MLEP (800,000)
Activity 3.2.2 Deciding reforestation structures oriented to mixed forests	2006-2009	

Activity 3.2.3 Development of nursery technology for propagation of important tree species, especially broad leaved species	2007-2009	
Activity 3.2.4 Deciding tree planting season and reforestation structure based on consideration of spring drought	2006-2009	
Objective 3.3 Rehabilitation technology of degraded forest land by assisted regeneration		
Activity 3.3.1 Assessment of regeneration capacity of degraded forest land and deciding suitable sites for assisted regeneration	2006-2008	MLEP MOFI (750,000)
Activity 3.3.2 Demonstration of planning and implementation of assisted regeneration of degraded forest land	2007-2010	
Objective 3.4 Mitigation of land degradation by transfer and extension of agro-forestry technology in sloping land		
Activity 3.4.1 Technological transfer and extension of agro-forestry in sloping lands	2006-2010	MOLEP MOA AOAS
Activity 3.4.2 Technological transfer and extension of silvo-pastoral management in sloping lands	2006-2010	
Programme 4. Prevention of Forest land degradation of sustainable management of public forests and industrial forests		
Objective 4.1 Formulation of National Forest Programme and development of Criteria and Indicators of Sustainable Forest Management		
Activity 4.1.1 Assessment of existing forest management activities and forest status	2006-2007	MLEP MOFI (300,000)
Activity 4.1.2 Formulation of National Forest Programme	2007-2008	
Activity 4.1.3 Development of Criteria and Indicators for Sustainable Forest Management	2007-2008	
Objective 4.3 Demonstration of ecosystem rehabilitation and rural and forest products for agriculture by application of community forest management technology.		
Activity 4.3.1 Assessment of social forest management by coop farm, enterprises and so on	2006-2008	MLEP MOA Relevant institutions in selected districts
Activity 4.3.2 Deciding the forest size for coop farms according to communities and development of their management methodology	2006-2008	
Activity 4.3.3 Demonstration of coop farm forest management in	2007-2010	

selected coop farms		(700,000)
Objective 4.4 Transfer and extension of multi-purpose forest management		
Activity 4.4.1 Assessment of potential of wood and non-wood forest products in major forest types	2006-2008	MLEP MOFI MOA (500,000)
Activity 4.4.2 Assessment of ecological and social function in major forest types	2006-2008	
Activity 4.4.3 Options and demonstrations of multi-purpose management technology for forests to contribute to sustainable rural development	2007-2010	
Programme 5. Soil and water conservation through improving management of eco-protection forests and protected area		
Objective 5.1 Establishment of eco-protection forests and improvement of their management		
Activity 5.1.1 Assessment of status and management of existing water conservation and anti-erosion forests	2006-2008	MLEP SAOS Other relevant institutions (800,000)
Activity 5.1.2 Development of improved criteria and indicators for establishment and management of eco-protection forests	2007-2008	
Activity 5.2.3 Demonstration of organic combination of conservation and development through planning and implementation of biosphere reserve management	2007-2010	
Programme 6. Transfer and extension of conservation farming in agricultural sloping lands		
Objective 6.1 Development and extension of conservation farming in rain-fed fields of sloping lands		
Activity 6.1.1 Assessment of status of land use and soil erosion in rain fed fields of sloping lands	2006-2008	MLEP MOA AOAS (600,000)
Activity 6.1.2 Technological transfer and demonstration for erosion control in rain-fed fields of sloping lands	2006-2010	
Activity 6.1.3 Technological transfer and extension of improved cropping in rain-fed fields of sloping land	2006-2010	
Objective 6.2 Development and extension of soil and water conservation in sloping orchards		
Activity 6.2.1 Assessment of status of land use in sloping	2006-2008	MOA

orchards		AOAS (600,000)
Activity 6.2.2 Demonstration of introduction of inter-cropping and green manure crops in sloping orchards	2007-2010	
Programme 7. Technological transfer of eco-farming and organic farming in agriculture of low lands		
Objective 7.1 Introduction of eco-farming in agriculture of low lands		
Activity 7.1.1 Assessment of ecological conditions of agriculture fields of low-lands	2006-2008	MOA
Activity 7.1.2 Technological transfer and demonstration of windbreak establishment	2007-2010	AOAS MLEP
Activity 7.1.3 Technological transfer and demonstration of rational structure of cropping	2007-2010	(850,000)
Objective 7.2 Technological transfer of organic farming in low-land agriculture		
Activity 7.2.1 Assessment of land degradation status in arable lands by application of chemical substances and rough-processed solid wastes	2006-2008	MOA AOAS
Activity 7.2.2 Demonstration of technological transfer of organic farming in rain-fed fields	2007-2010	MLEP (750,000)
Activity 7.2.3 Demonstration of technological transfer of organic farming in paddy fields	2007-2010	
Programme 8. Technological transfer of watershed management for integrated and sustainable land management		
Objective 8.1 Survey and assessment of watershed and setting priorities		
Activity 8.1.1 Selecting survey and assessment methodology of watershed	2006-2007	MLEP SAOS
Activity 8.1.2 Survey and assessment of watershed and establishment of database	2007-2010	SHMA Other relevant institutions
Activity 8.1.3 Selecting of criteria and methodology of setting priorities for watershed management	2007-2010	(600,000)
Objective 8.2 Demonstration of participatory watershed management		
Activity 8.2.1 Demonstration of land use management planning in watershed	2007-2010	Local authorities in

Activity 8.2.2 Demonstration of sustainable resources use in watershed	2007-2010	selected areas MLEP (400,000)
Activity 8.2.3 Demonstration of pollution prevention in watersheds	2007-2010	
Objective 8.3 Technological transfer of monitoring on watershed management		
Activity 8.3.1 Setting baseline and criteria for monitoring in watershed management	2007-2009	MLEP SHMA
Activity 8.3.2 Monitoring technology of land degradation in watershed management	2007-2010	
Activity 8.3.3 Monitoring technology of biodiversity in watershed management	2007-2010	
Activity 8.3.4 Monitoring technology of pollution in watershed management	2007-2010	
Activity 8.3.5 Monitoring technology of water resources in watershed management	2007-2010	
Programme 9. Technological transfer for mitigating natural disasters		
Objective 9.1 Assessment of threats of natural disasters	2006-2009	MLEP, HMA, SAOS, Other relevant (400,000)
Objective 9.2 Technological capacity strengthening of hydro-meteorological forecast and early warning system	2006-2008	HMA, SAOS, MLEP (500,000)
Objective 9.3 Development of strategy and action plan for preparedness against disasters	2007-2010	MLEP HMA (300,000)
		Total Budget (17,950,000)

### Section 3. Priorities for international cooperation

The land degradation issue often occurs due to unsustainable management of forests, rangelands and agricultural lands.

Specifically, the deforestation is most critical factor of land degradation in DPR Korea as it affects not only forestlands but also low lying cultivation areas and contributes to the reduction of agricultural production.

The National Action Plan has therefore addressed a number of thematic areas to cover all land degradation issues.

The immediate action plan (2006-2010) is aimed rather to prevent the land degradation by addressing the causal factors and has the focus on the capacity building issues for the integrated land management.

In this context, the international cooperation is an important factor in implementation of the NAP. Thus the NAP has considered and identified priority issues for the international cooperation in combating land degradation, using the following principles; 1) to create enabling environment at central governance level and capacity building of local land management; 2) to promote capacity building projects, transfer, demonstration and replication of best technologies and practices, and increase their synergistic effects; and 3) to harmonize the national land combating issues with the implementation of global environmental objectives such as Millennium Development Goals. And the criteria used for setting cooperation priorities include the scope of the issue, its urgency and relation to other environmental areas as well as the cooperation demand.

## **1. Establishment of national land management information database and development of national strategy and action plan for sustainable land management**

### **Background**

Establishment of land use information database is a challenging requirement for the integrated management of the land resources of the country.

It will lay the basis for the scientific researches and public awareness raising on integrated and rationale management and use of land resources, provide input to the development of strategy and action plan for sustainable land management as well as the starting point of monitoring and evaluating the implementation process of the action plan and any changes in land use and degradation patterns.

The proposed project is aimed to establish comprehensive national land information database in support to the development of strategy and action plan for sustainable land

management. It will enable the timely record of land use changes and promote the sharing and exchange of information among relevant stakeholder agencies.

**Objective and expected activities:**

The proposed project is aimed to establish GIS-based national land information database in support to the development of strategy and action plan for sustainable land management. It will enable the timely record of land use changes and promote the sharing and exchange of information among relevant stakeholder agencies. The expected activities are:

- Classification and identification of criteria and indicators for land information database.
- Mapping on the use and management of land and water resources using GIS
- Assessment and analysis on the use and management of land and water resources using GIS
- Development of strategy and action plan for sustainable land management
- Establishment of monitoring system on the land use changes based on GIS

**Expected outcomes**

- information map on the land use and management
- ecological assessment on the land use patterns
- strategy and action plan for sustainable land management
- monitoring and evaluation guidelines on the management and use of land resources
- 

**Implementing agency:** MLEP, AoFS, Institute of Remote Sensing and Geometrics, Institute of Geography, Institute of Soil Sciences under the Academy of Agricultural Sciences, State Hydro-meteorological Administration, Central Statistics Bureau.

**Period:** 2006-2010

**Estimated Budget:** Total 1,650,000 US\$

International organization(s) input	950,000
Cofinancing	200,000
Government input	500,000

**2. Technical transfer and dissemination of technologies for rehabilitation of degraded forestlands and establishment of sustainable firewood forests**

**Background**



The deforestation is the main causal factor of land degradation and occurs often by the overcollection of firewoods driven from the shortage of rural energy.

Entering new millennium, the government has set strategic policy to strengthen the mountain and river management and implement the greening and gardening overall the country and launched for its implementation nationwide land management campaign by setting up General Turn-out Month for Land Management in each spring and autumn to promote the reforestation and rehabilitation works of degraded forests.

Despite these efforts and advocacy, there occurs continuous soil losses and erosion in sloping lands, and rural energy shortage becomes more serious. To solve these problem, there needs innovative approaches and measures for proper land management.

**Objective and expected activities:**

The purpose of this project proposal is to rehabilitate the degraded forests and improve the establishment and sustainable management of firewood forests in rural areas, thus to remove main causal factor of land degradation and contribute to the livelihood improvement in rural areas. It will also have crosscutting effects to the implementation of the national action plans related to climate change and biodiversity conservation.

Follwing activities are expected to achieve this objective;

- Assessment of degraded forest lands and identification of technologies for their rehabilitation
- Assesment of demands for firewood and identification of options for firewood production in rural areas.
- Introduction of firewood saving technologies including improved oven in rural households
- Transfer of technologies related to reforestation and rehabilitation of degraded forests
- Transfer of technologies related to rehabilitation of degraded forests through assisted natural regeneration.

**Expcteted outcomes**

- technical transfer and demonstration on rehabilitation of degraded forestland
- technical transfer and demonstration on establishment and sustainable management of firewood forests.
- Tehnical transfer and demonstration on firewood saving technologies

**Implementing agency:** MLEP, Ministry of Forestry Industry (MoFI)

**Period:** 2006-2010

**Estimated Budget:** Total 800,000 US\$

### **3. Technical Transfer on sloping land management and agro-forestry as part of integrated management of mountainous areas.**

#### **Background**

The sustainable sloping land management and agro-forestry are considered to be promising options to promote safe food production and rural energy supply, ensuring the development activities sustainable and compatible with the environmental protection.

Compared to the mountainous areas covering approximately 80% of total country's territory there are very limited arable lands available, making it inevitable to encroach to the sloping forest lands to reclaim them for crop cultivation and other land use purposes.

Since mid 1990s, the repeated natural disasters and economic stagnancy has brought about devastation of large areas of forestlands including uncontrolled conversion activities in sloping forestlands, leading to severe degradation and soil erosion in sloping lands and increase of threats by floods and droughts. Unsustainable management of traditional and newly reclaimed sloping arable lands has worsened more land degradation.

#### **Objective and expected activities:**

The proposed project has the objective to arrest and reverse the degradation of sloping lands and ensure the sustainable rural development through; development and implementation of rational and sustainable land use plan for sloping lands overall the country; technical transfer and dissemination of technologies related sustainable forest management, especially the agro-forestry and conservation farming in sloping and lowlands. It will also support the implementation of national strategy and action plans under CBD and UNFCCC .

The activities envisioned are;

- Assessment on use and productivities of sloping lands
- Preparation of guidelines for sloping land management planning and its demonstration
- Demonstration of community based forest management using forest user groups
- Technical transfer and demonstration of agro-forestry by different land categories
- Technical transfer and demonstration of silvo-pasture by different land categories
- Technical transfer and demonstration of silvo-medical plants cultivation technologies by different land categories
- capacity building of forest user groups at county-level forest management board and its demonstration

**Expected outcomes:**

- guideline on sloping land management planning
- guideline on agro-forestry
- demonstration and replication of sustainable sloping land management practices including agro-forestry.

**Implementing agency:** MLEP, Institute of Geography of SAoS,

**Period:** 2006-2010

**Estimated Budget:** Total 700,000 US\$

#### **4. Capacity building of land management in Cooperative Farm Management**

##### **Committee and demonstration of sustainable management of agricultural lands**

###### **Background**

The sustainable development of agricultural lands is a primary and crucial issue for food security of the country.

In DPR Korea, the agricultural lands consisting mainly of paddy, non-paddy fields and fruit orchards are very limited with per capita average of about 0.08ha.

The large proportion of non-paddy fields are located in sloping lands covering about 360,000 ha. Through the unsustainable cultivation practices in these lands the top layer of its soil was thinned through soil erosion and the level of nutrients content lowered remarkably. It is similar to the plain non-paddy fields.

The intensive use and lack of organic farming on rice cultivation lands have also lowered nutrients content of its soil. Especially the destruction of colloidal substances in rice fields of tideland-origin has led to lower production yield of rice grain in those lands.

In this context, the implementation of sustainable land management requires primarily the capacity building of Cooperative Farm Management Committees which are the basic units of agricultural land management and agricultural production. The capacity building of the committees and its demonstration will promote the successful implementation and replication of sustainable management of agricultural lands.

###### **Objective and expected activities:**

The objective of the project is to promote the safe food production and sustainable rural development through technical transfer and demonstration of technologies for reversing the degradation of agricultural lands and sustainable land management.

Activities

- Assessment on the use of sloping agricultural lands and their potential for sustainable management
- Introduction and demonstration of conservation farming methods in sloping lands
- Assessment on degradation of plain non-paddy fields and demonstration of productivity improvement of these fields through introduction of organic farming.
- Introduction and demonstration of organic farming in rice fields, particularly in those fields of tideland origin
- Capacity building of Cooperative Farm Management Committees (CFMC) in operating Technical Extension Office
- Demonstration of establishing and management of wind breaks in agricultural lands
- Capacity building of CFMCs in developing and implementing land management plan, monitoring and evaluation

**Expected outcomes**

- guideline for crop cultivation in sloping lands
- Demonstration of sloping land management
- Demonstration of organic farming in general non-paddy fields
- Demonstration of rehabilitation of rice fields of tideland origin through introduction of organic farming
- Demonstration of establishment and management of pilot wind breaks
- demonstration of modernization of Technical Extension Office of CFMCs
- capacity building of CFMCs in sustainable land management

**Implementing agency:** MoA, Academy of Agricultural Sciences,

**Period:** 2006-2010

**Estimated Budget:** Total 850,000 US\$

**5. Technical transfer and demonstration of watershed management (capacity building and demonstration of participatory watershed management and sustainable rural development)**

**Background**

The territorial land of DPRK covers more than 10,000 watersheds and 73.2% of the land is occupied by forest land.

Annual rainfall is about 1000~1200 mm. Watershed management practices, therefore is assumed as key role activities for natural environment protection and sustainable rural development.

As common as in many developing countries, watershed degradation is one of main environmental issues in DPR Korea owing to socio-economic development activities and climate change.

Main issues in watershed degradation are related to deforestation and land use change, improper land management, infrastructure development, pollution and so on.

Deforestation occurred in 1990s damaged as much as 1.5 million ha, including 360,000 ha of encroached forest area. It has been main cause of watershed degradation – land degradation.

It is also main a main cause of habitat loss and isolation and increased threatened species which leads to decreased biomass, accordingly carbon pool which was roughly estimated as tens of millions of tons of carbon stock, which might contribute to global warming.

Global warming is evidenced in the increase of air temperature by about 1 °C between 1990-2000 on average comparing to those between 1920 - 2000 in the DPRK.

From above brief description, solving watershed degradation issue actually becomes a prerequisite in environmental protection and livelihood improvement in DPRK.

The government, entering new century, set forth a strategic policy on strengthening mountain and water management and is launching nation-wide movement for the reforestation and greening of the whole country. The government also took measures to unfold General turn-out activities monthly in every spring and autumn for rehabilitation of degraded land and ecosystems. Accordingly, 130,000 ha of forest land are restocked by planting trees and 900 km of riverbanks are treated every year.

The FAO supported technical cooperation project entitled “participatory integrated watershed management in upland areas” was carried out between 2002-2004 (TCP/DRK/169). The main objective has been to assist the Ministry of Land and Environment Protection in its efforts to reverse the watershed degradation focusing on the rehabilitation of damaged nurseries, on technical capacity building related to participatory, integrated watershed management and on small-scale demonstration and training activities in selected pilot watersheds.

The project proposed the national watershed management strategy highlighting three phase of approaches to address the problem through a national watershed management programme in DRPK. They are:

- (a) Short - term – orientation phase (2004-2008)
- (b) Medium term – expansion phase (2009-2020)

(c) Long – term consolidation phase

Under the strategy, 8 activities are proposed during the orientation phase, while 7 and 4 activities are expected in medium and long term periods to expand and consolidate the activities of orientation phase.

Among the 8 activities proposed in orientation phase, the issues related to capacity building are as follows:

- Strengthen the MLEP's watershed management capacity
- Participatory watershed management in five critical watersheds located at five counties in DPR Korea
- Capacity development of national watershed condition survey
- Support to Forest Science Academy
- Human resources development for watershed management
- Land reclamation and stream channel training activity in problematic counties.

But the recommendations are not realized and under consideration, because of low capacity and financial shortage.

Some constraints and weakness to address watershed degradation are previously considered as follows.

- lack of public understanding on watershed management approach and technology
- lack of specialized technologies on watershed survey, assessment, prioritization, formulating strategy and action plans
- lack of understanding on best practices for given watershed management including land use planning, resource management and pollution control
- weak institutional arrangement to address watershed degradation
- weakness in mainstreaming the watershed management issues to national development planning
- lack of consideration of watershed degradation into CCD, CBD, FCCC and MDGs in a integrated way
- weakness in supervision and coordination in water resources management

Identified capacity needs (objectives) are as follows:

- public awareness raising including decision making level
- survey and assessment on status of watershed countrywide with application of GIS
- prioritization of watershed management and formulation of strategy and action plan
- establishment of demonstration sites including land use planning, best practices for sustainable resource sue, pollution control, EIA process, and institutional development
- training staff and technicians
- improved policy and legislation

Proposed project of watershed management will greatly contribute to sustainable rural development and environmental protection. It will also contribute to implementation of national obligations under Rio-conventions through;

- preventing land degradation and mitigating national disasters (UNCCD and GEF OP15)
- biodiversity conservation and sustainable use of its components (CBD, GEF OP12 and others)
- reduction of greenhouse gases emissions and increasing carbon sequestration by LULUCF (FCCC and Kyoto Protocol)
- contribution to poverty reduction in rural areas (MDGs, UNCCD)

**Planned activities:**

- public awareness raising activities including workshops, printing materials, media, study tour, cross-visiting and so on
- training activities for staff and technicians through oversee training, workshops and hands-on training
- 
- watershed survey and mapping using existing information and additional field survey
- establishment of database
- watershed assessment and prioritization
- formulation of national strategy and action plan for watershed management
- 
- selection of demonstration sites and land use planning
- application of best practices to demonstration sites according to land use categories
- development of major pollution sources and taking measures to control it
- introduction of EIA in the case of development projects
- 
- relationship assessment between watershed management and sustainable rural development
- extension of watershed management technologies through various means

**Expected outcomes:**

- adaptation of innovative methodologies and approaches of watershed management at national level
- raised public awareness in watershed management; trained staff and technicians; establishment of demonstration in selected sites
- enhanced capacities of watershed management at institutional and individual levels

**Implementing agency:** MLEP, SAoS, selected rural authorities

**Period:** 2006 – 2010

**Estimated budget :** Total 1,450,000 US\$

GEF: 750,000 US\$

Co-financing : 250,000 US\$

Government input : 450,000 US

## **6. Development of National Forest Programme; Capacity building of District Forest Management Board(DFMB) and Industrial Forest Management Board(IFMB) at County level and its demonstration**

### **Background**

Forest Management is an essential part of addressing land degradation and plays vital role in the biodiversity conservation and mitigation/adaptation of climate change.

Specifically with its coverage of 73.2% of total land area, the forest land significantly contribute to the socio-economic development and protection of agricultural eco-environment.

### **Objective and expected activities**

The objective of the project proposal is to prevent the land degradation and implement the sustainable land management in forest lands that safeguards the stable production of forest products and provides safe ecological environment for agriculture and, further, contribute the implementation of national action plans related to biodiversity conservation and climate change and sustainable development of the country.

Expected Activities:

- Assessment of forest resources and their management overall the country
- Preparation of national forest programme
- Improvement of policy and legislations related to forest management
- Development of criteria and indicators for sustainable forest management
- Demonstration of 10 year project of forest management at selected District Forest Management Board(s) (DFMB)
- Demonstration of 30 year rotational timber logging master planning and implementation at selected Industrial Forest Management Board(s) (IFMB)
- Demonstration of community-based forest management

### **Expected outcomes**

- National forest programme
- Improved laws and regulations related to forest management
- National report on sustainable forest management
- Guideline for developing and implementating 10 years plan for sustainable forest management at DFMB and its application demonstrated
- Guideline for developing and implementating rotational timber logging masterplan at IFMB and its application demonstrated
- guideline for community-based forest management and its application demonstrated

**Implementing agency:** MLEP, **MoFI**



**Period:** 2006 – 2010

**Estimated Budget:** Total 950,000 US\$

## **7. Strengthening of the capacity for the effective early warning and advance planning against natural disasters**

### **Background**

The occurrence of disasters is a natural phenomenon, but it becomes more frequent and more cost-bringing due to human-induced deterioration of the global environment.

Today, natural disasters are considered to be a significant factor driving rapid land degradation and acceleration of poverty, and also one of the main challenges to sustainable socio-economic development.

Located in the temperate monsoon zone and having mountainous areas up to nearly 80% of its total terrestrial area, and semi-surrounded by seas, the DPR Korea is naturally very sensitive to natural disasters.

The successive floods in 1995 and 1996 and the droughts and strike by tidal waves in the following year, 1997 brought about tremendous damages and costs to the agricultural and forest sectors as well as settlement areas.

### **Objective and expected activities**

The project proposal has the objective to minimize natural disasters and land degradation, to protect human life and properties through enhancing early warning and prompt response abilities against natural disasters.

Expected activities:

- Assessment of ecological vulnerability of the whole country and risk analysis of natural disasters
- Capacity building of climatic, hydrologic and earthquake forecasting
- Establishment of early warning system
- development of preparedness plan against natural disasters and demonstration of disaster reduction management in selected areas

### **Expected outcomes**

- Ecological vulnerability and risk assessment map

- enhanced capacities of State Hydro-meteorological Administration and Earthquake Research Institute in observation, projecting, information gathering, forecasting and communication services

- Establishment of nationwide early warning system against natural disasters
- Preparedness plan against natural disasters
- demonstration of disaster reduction management

Implementing agency: MLEP, State Hydro-meteorological Administration, Institute of Remote Sensing and Geometrics, Insitute of Geograph, Earthquake Research Institute, Academy of Agricultural Science

Period: 2006 – 2008

Estimated Budget: Tota 1,000,000\$

## **8. Promotion of public awarenss and development of human resources for combating land degrade.**

### **Background**

To reverse the aggravating trends of land degradation including desertification, droughts and deforestation at both national and global scales, it is necessary, first and foremost, to raise the public awareness and concern on land degradation and develop human resources to cope with it.

The land degradation is becoming one of major environmental concerns in DPR Korea.

However, there are poor understanding and knowledge among the public on the eclolgical functions and services of the forests in the environement, land degradation issues including soil erosion and salinification, and their causes and consequences.

Therefore, the public awareness raising and develop proper human resources are the prerequisite for reversing the land degradation and implementing the sustainable land management at national and local levels.

### **Objective and expected activities:**

The project proposal will promote the capacity building at institutional and individual levels and create enabling climate to address land degradation by focusing on the public awareness raising activities and development of human resources. It will also increase the capabilities of solving the land degradation issue in synergies with other environmental agreements and integrating it into national development plans.

Expected activities:

- Strengthening of public awareness activities using various means and mechanisms.
- Training of managerial officers and technicians active in the field of land management through establishment and operation of national training center.
- Assessment and improvement of the training curriculums of relevant universities and colleges
- Assessment and improvement of training scientists and technicians at Doctoral Institute of Academy of Forest Sciences, Academy of Agricultural Sciences and other relevant universities.

**Expected outcomes:**

- Improved awareness among the public
- Establishment of re-training system of managerial officers and technicians active in the field of land management through operationalization of national training center
- Improved training curriculums on land management in relevant universities and colleges, and increased number of trained experts.
- Increased number of trained scientists and technicians through doctoraship process

**Implementing agency:** MLEP, Ministry of Education, Academy of Agricultural Sciences, mass media institutions

Period: 2006 – 2010

**Estimated Budget:** Total 650,000 US\$

## Section 4. Institutional Arrangement to combat land degradation

### 1) National Coordinating Body

The Ministry of Land and Environment Protection will act as coordinating body for combating land degradation in DPR Korea.

### 2) Promotion Committee(PC) for Sustainable Land Management

The Promotion Committee will be established comprising representatives from MLEP, MoA, MoFI and other relevant stakeholder agencies. It will work under the guidance of NCCE and have regular meetings semi-annually to review and take measures for the

implementation of the NAP. In this regard, the MLEP will take a leading role in operation of Promotion Committee.

### 3) Scientific and Technical Advisory Body (STAB)

The Scientific and Technical Advisory Body or STAB will be established comprising scientists and technicians active in land management, forestry and agricultural sectors and from relevant scientific institutions and universities

### 4) NAP Implementation Secretary

The Land Supervision Department under MLEP will provide secretarial service for the implementation of the NAP.

The MLEP has the mandate to supervise and control overall land resources and their management.

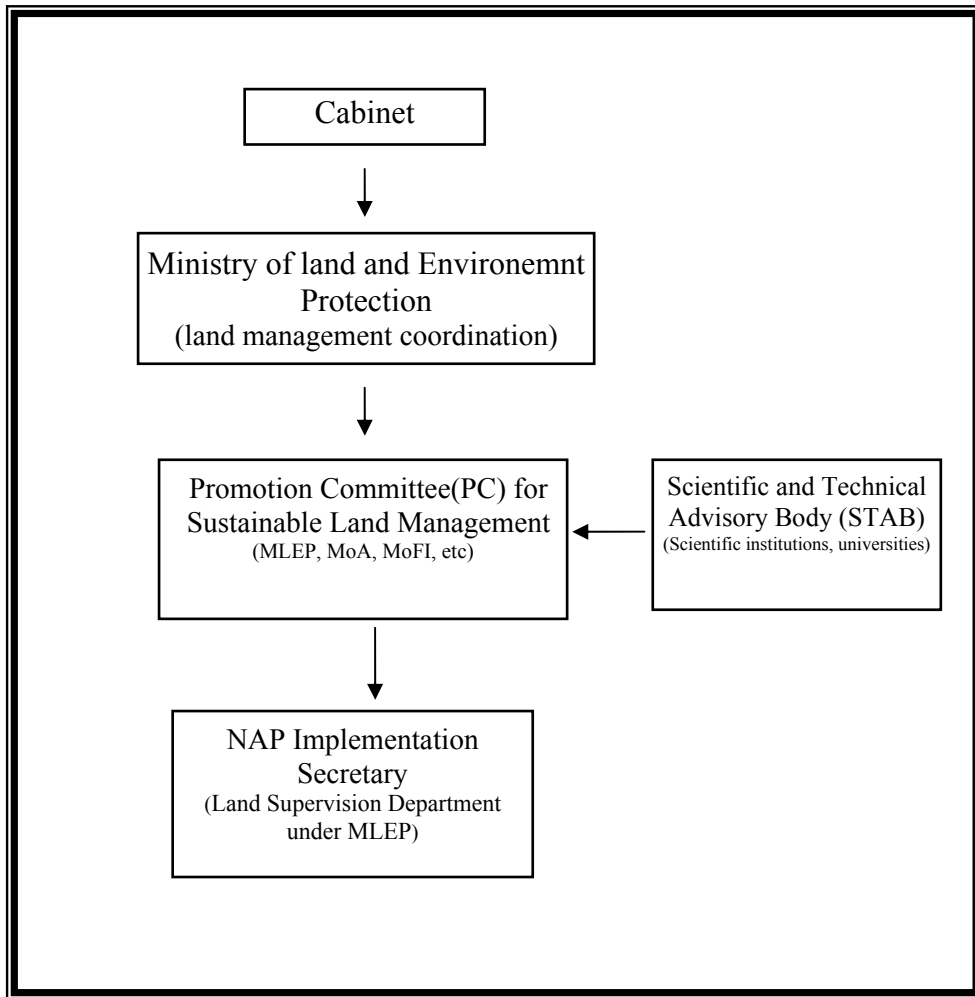


그림 2 . National institutional arrangement for combating land degradation

## Chapter 4. Potential Financial Sources

### 1. Internal sources

#### 1.1 Investment by central government

Recently, the government has paid great attention and exerted its efforts to increase the investment in the land management area. Large proportion of the investment are allocated to the nationwide land management campaign activities during General Turn-out Month for Land Management in each spring and autumn.

For example, the investment included 1.5 billion Won (or 10 million US\$) for reforestation works, 0.8 billion Won (or 5 million US\$) for rehabilitation works of river and streams and 2.5 billion Won (or 16 million US\$) for realignment of arable lands and irrigation waterway projects, respectively.

However, there were low effectiveness and efficiency of these investments because of the limited financial budget and lack of strategy and action plan for combating land degradation and sustainable land management. Furthermore there were insufficient funding to the field of scientific researches on land and water management.

Nevertheless, the government's financial input in the land management area is likely to be increased, with the revitalization of the country's economy.

#### 1.2 Local Investment

There are small and insufficient investments by local governments due to limited fund resources. With limited sources for income generation, and trying to meet the demands of rural peoples for their basic living, the local governments were not able to raise proper funds necessary for land management.

The total investment allocated to the land management activities including reforestation, river management and waterway projects from land management and planning authorities at provincial and county levels amounted about 4.5 billion Won (or 30 million US\$) annually on the average. This investment by local governments is also likely to further increase, together with budgetary improvement of local governments.

#### 1.3 Inputs from settlement administrations and public organizations

local communities (Ri and Burak) play important role in land management campaigns and cultural works. Coordinated by the People's Committees of each county, the local communities design their own schemes for land and environmental management and implement them with public mobilization. Their input was estimated to be about 1.2 billion Won (of 8 million US\$) per year. Most of these inputs are labor input.

#### 1.4 Contribution by the people in land management

Land management has direct co-relation with the food safety and safe living environment of the people.

The local peoples participate voluntarily in the land management projects and activities. In this regard, it is important to further promote the public awareness among the peoples.

## 2. Financial support from international agencies

### 2.1 contribution from the world communities

There is yet to explore the contribution potential from international communities with regard to combat land degradation.

Considering the fact that the DPR Korea signed the UNCCD in late 2003 and commenced its activity as a party to UNCCD since April 2004, there was not time enough to raise funding sources from the world communities. Furthermore, it was due to fact that the country has not prepared the NAP for CCD implementation.

However, though insufficient but some contributions from different international agencies including WFP and non-governmental agencies in the form of emergency support and humanitarian aids in relation to the repeated damages by natural disasters have been channeled to the rehabilitation works of degraded lands.

It should be also noted that the non-membership to World Bank, Asian Development Bank and other international financial organization is another one constraining factor in raising external funding sources.

### 2.2. Investment by foreign enterprises

In the climate that enables the investment by foreign enterprises, there are some, though not enough, foreign funds invested in processing industry sectors in the form of loans and interest return. But they are not available for funding to land management.

### 2.3 Bilateral financial cooperation

Generally, the bilateral financial cooperations are very limited in DPR Korea. Further, they are rarely available in the field of land management.

Swiss Agency for Development and Cooperation (SDC) has provided and continues the financial support for agricultural sector. One of its supports includes the small scale sloping land management project which started since 2004 and provides financial input of 80,000 € annually on average. The project will be implemented by 2008, but is possible to further continue on long term basis.

Swedish International Development Agency (SIDA) had also provided support of about 20,000 € for training on sustainable forest development planning. It shows its likelihood to further provide small scale financial support for the implementation of the NAP after its approval and distribution.

### 2.4 UN agencies

Food and Agriculture Organization of United Nations (FAO) has provided in recognition of the pending need for sustainable land management a technical cooperation project (TCP/DPR/0169(A), 330,000 US\$ ) entitled “participatory and integrated watershed management in upland areas” between 2002-2003. Through the implementation of this project awareness on watershed management approach was increased among participant stakeholders and 8 follow-up activities proposed. However, due to limited funding sources of this agency and lack of additional sources available for cofinancing, the proposed follow-up activities remain unimplemented.

The proposed follow-up projects are as follows;

- Capacity building of MLEP
- Demonstration of integrated watershed management in 5 selected counties
- Monitoring and survey of watershed area
- Human resources development for watershed management
- Capacity building of Academy of Forest Sciences
- Assistance to the reforestation works
- Assistance to the river management
- Assistance to the pest and disease management



FAO has also developed project document on lowland forest management in DPR Korea, but its implementation seems to be delayed due to, may be, budgetarial constraints generated from unexpected events such as tsunami disaster.

UNCCD Secretariat has provided financial support of 10,000 US\$ for the organization of national awareness workshop on UNCCD implementation in DPR Korea and, further, assisted financially the process of NAP preparation.

UNEP has approved the concept paper on sustainable land management under GEF OP 12 and 15 submitted by the government and financed 25,000US\$ for the PDF A- development of project document. This project document is yet to be approved finally by the agency.

#### 2.5 Global Environment Facility (GEF) and Global Mechanism (GM)

The Global Environment Facility or GEF contributes to the country' s efforts and implementation of national obligations under global environmental agreements via UNEP and UNDP. Until now its assistance was mainly confined in the biodiversity focal area, especially in protected areas management projects.

Recently, a new medium-sized project document for capacity building and demonstration in integrated land use management was developed under GEF OP 15 and 12 through PDF A process and is expected to receive 800,000 US\$ of GEF Grant for the project implementation.

Raising funds through Global Mechanism is yet to be initiated.

Using this mechanism would enable the mobilization of funding sources necessary for the development and implementation of projects under the NAP.

In addition, other mechanisms such as polluter pay principle(PPP), CDM projects under Land Use, Land Use Change and Forestry (LULUCF) can be potentially utilized for funding the projects related to prevention of land degradation and implementation of sustainable land management.

## Chapter 5. Monitoring, Evaluation and Communication on the Progress of NAP Implementation

The present National Action Plan or NAP is an initial document of the DPR Korea that manifests the intention of the country to take action for reversing the land degradation.

In the first stage of 5 year period the NAP will be implemented with the focused on the capacity building and demonstration activities. It will serve as basis of development and implementation of national strategy for sustainable land management, and be then further reformulated periodically based on the results of previous implementation stage.

It is necessary, therefore, to monitor and evaluate the progress of NAP implementation.

Through monitoring and evaluation, the achievements and lessons gained from the implementation process will be analysed for further revision and update of action plan and the improved knowledge and information sharing promoted.

The NAP has clarified the targets and time tables of planned activities. The monitoring and evaluation process will be built upon them and made in the form of preparing the annual progress report one year after commencement of the plan and at the end of each following year. If necessary, the review meeting can be held on an annual basis in which the results, lessons and obstacles reviewed and follow-up measures discussed.

The Ministry of Land and Environment Protection (MLEP), Ministry of Agriculture (MoA) and Ministry of Forestry Industry (MoFI) are together responsible for monitoring and evaluation process, and in close collaboration with Scientific and Technical Advisory Body (STAB).

Proper criteria and indicators for monitoring will be developed.

International agencies can be invited to the monitoring process, if necessary.

Communication is also important for the success and sustainability of NAP results.

Information on the NAP should be disseminated by following means;

- Publication and dissemination of NAP document among all stakeholder agencies following approval by government.
- Distribution of annual progress reports to government departments and key stakeholders.
- Dissemination of information for potential users of new information management systems and databases that are produced by from NAP implementation

- Publication and wide dissemination of best practices, ‘success stories’ and related results of NAP implementation among stakeholder agencies.

## Annex 1. Stakeholder agencies involved in the process of UNCCD-NAP preparation

- National Coordinating Committee for Environment (NCCE)
- Ministry of Land and Environment Protection (MLEP)
- Ministry of Agriculture(MoA)
- Academy of Agricultural Sciences
- Ministry of Forest Industry
- State Planning Commission
- State Hydro-meteorological Administration
- Central Statistics Bureau
- Land Development Planning Institute
- Institute of Geography
- Academy of Forest Sciences
- Environment and Development Center
- Central Forest Design Technical Institute
- Faculty of Life Science and Faculty of Global Environment Science, Kim Il Sung University
- Associations of land, water and forest protection under Korea Nature Conservation Union
- Land and Environment Protection Department of South Pyongan Province
- Land and Environment Protection Department of North Hwanghae Province

## Annex 2. List of member of working group for preparation of national action plan

Mr. Kim Kwang Ju	Team leader of the working group, head of External Cooperation Unit, MLEP
Mr. Kim Kwang Pil	Researcher of Environment and Development Center, MLEP
Mr. Jo Il Son	Researcher of Institute of Soil Sciences, Academy of Agricultural Sciences
Mr. Jong Dae Yong	Researcher of Institute of Geography, State Academy of Sciences
Mr. Ri Kwon Chol	head of research unit, State Hydro-meteorological Administration
Mr. An Chol Ho	Division chef of Academy of Forest Sciences

## Annex 3. National workshops and consultations related to the preparation of national action plan

- National awareness workshop on UNCCD implementation and preparation of national action plan  
(Date: June 15-16, 2005; Venue: Meeting hall of Ryanggang Hotel, Pyongyang; Total 65 representatives from 17 agencies and organizations at central and local levels; and 2 international consultants participated in the workshop)
- Consultations on the forms, causes and consequences of land degradation (first meeting on July 28 and second meeting on August 25; place of the consultation: Country Office for implementing the UNCCD; consulted among NAP preparation working group and representatives from stakeholder agencies)
- Mini-workshops on the measures to combat land degradation ( first-September 29; second- October 27; venue- Country Office for implementing the UNCCD; NAP preparation working group and representatives from stakeholder agencies participated)
- Preliminary meeting on the strategy, action plan and priority setting for combating land degradation (Date: November 23; place of meeting- Country Office for implementing the UNCCD; NAP preparation working group and representatives from stakeholder agencies participated)
- National validation workshop to finalize the NAP