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FOREWORD

Environmental concerns date to long time back, and they prompted the country to take measures aimed at environmental protection. Various initiatives were taken at different periods. Thus during the colonial era, programmes for the conservation and establishment of protected areas and other reserves were launched and continued well after independence.

However, the degradation of environment continued to worsen as a result of the population pressure, serious erosion, pressure on natural resources, massive deforestation, pollution in its various forms, lack of a strong and coherent political, institutional and legal framework and, in a particular way, as a result of the 1994 war and genocide.

Faced with this situation, the Government of National Union found it necessary and urgent to provide the country with an environmental policy capable of improving man's well-being, with a view to guaranteeing sustainable utilisation of natural resources and the protection of vital ecosystems for present and future generations.

The National Environment Policy sets out overall and specific objectives as well as fundamental principles for improved management of the environment, both at the central and local level, in accordance with the country's current policy of decentralisation and good governance.

The policy sets out also institutional and legal reforms with a view to providing the country with a coherent and harmonious framework for coordination of sectoral and cross-cutting policies. It furthermore introduces innovations including, among others, the establishment of a Rwanda Environment Management Authority and provincial and district or town committees responsible for environmental protection.

It also lays a solid foundation for the establishment of a legal framework for improved management of the environment, as well as the right principles for the participation of the population in general, and women and the youth in particular.

The National Environment Policy contains policy statements and strategic options with regard to population and land-use management, management and utilization of natural resources and other socio-economic sectors, as well as the necessary arrangements for the implementation of the policy. It provides a framework for the reconciliation of the three pillars of sustainable development, namely environment, social and economic issues. It is thus in line with the policy for poverty reduction while ensuring the quality of life and environment.

This policy is the outcome of wide consultations carried out by the Ministry of Lands, Resettlement and Environment. The preparation of the policy document involved State institutions, United Nations Agencies, Non Governmental Organisations and Civil Society at every stage.

The Ministry of Lands, Resettlement and Environment wishes to thank in a very particular way the United Nations Environment Programme (UNEP) and the United Nations Children's Fund (UNICEF) for their financial and material support.

It conveys also its deep gratitude to all the national experts and to all those who, in one way or another, contributed to the preparation of this policy document. Finally, it invites each and everyone to take an active part in its implementation.

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Minister of Lands, Resettlement
and Environment

Chapter 1. INTRODUCTION

Environment is a set of physical, chemical and biological elements as well as socio-economic, cultural, aesthetic and intellectual factors likely to have a direct or indirect, immediate or long term impact on the development of environment, human beings and human activities. It is a cross-cutting field and must be integrated in economic growth and social development with which it constitutes the three pillars of sustainable development. The fight against poverty, long term planning and protection and management of natural resources constitute the essential objectives of the national environment policy for sustainable development.

1.1 Environmental dimension awareness

Awareness of environmental issues in Rwanda goes back to the colonial period when actions aimed at the protection and conservation of environment were undertaken at different periods.

Indeed, reforestation activities started in 1920. Thereafter were created respectively Albert Park (1925), the Natural Forest of Nyungwe as a reserve forest (1933) and the Akagera National Park (1935). These environment friendly initiatives were also supported by a vast campaign for soil conservation initiated by INEAC (later known as the Institut des Sciences Agronomiques du Rwanda (ISAR)) since 1937 first in research stations, before extending it to the whole country when, in 1947, soil conservation activities were made compulsory by colonial law. This policy was discontinued after independence because it was resented as a drudgery.

After independence and particularly since 1977, action programmes of an environmental nature were launched under annual themes such as: human settlement (1977), stockbreeding (1978), soil protection and conservation (1980), water supply in rural areas (1981), erosion control (1982), reforestation (1983). Also in 1983, a Division of Hygiene and Environment was created in the Ministry of Health and Social Affairs. The first national seminar on environment was organized by this Ministry in 1985

This seminar recommended the development of a national environment strategy. This was done in 1988-1989, and the strategy was adopted by Cabinet in May 1991. The aims of this strategy were as follows:

- a. to enable the country to strike a dynamic balance between population and resources while complying with the balance of ecosystems;
- b. to contribute to sustainable and harmonious socio-economic development such that, both in rural and urban areas, men and women may realize their development and well-being in a sound and enjoyable environment;
- c. to protect, conserve and develop natural environment, these activities being the concerns of each and everyone.

In 1989 was created the "Environment and Development Project" in the Ministry of Planning, which later became the National Environment Unit, a springboard for the establishment of the Ministry of Environment and Tourism (MINETO) in 1992, the duties of which included, among others, the coordination of all environment related activities carried out by different ministries.

It should also be pointed out that during the same year, Rwanda took part in the Rio de Janeiro World Earth Summit and institutionalised the National Environment Week, which was in addition to other initiatives such as the establishment of the Office National de la Population (1981), the Tree Day (1980), the Water Day (22nd March), the Meteorology Day (23rd March), the Biodiversity Day (22nd May), etc. 1992 was marked by the drafting of the Law on Environment.

The 1994 genocide and massacres brought to a standstill the initiatives that had been launched, and they were revived by the Government of National Union. It is in this context that should be viewed the ratification of International Conventions such as:

- a. Convention on Biological Diversity (1995);
- b. United Nations Outline Convention on Climatic Changes (1998);
- c. United Nations Convention on Desertification (1998);
- d. Vienna Convention for the Protection of the Ozone Layer (2001);
- e. Stockholm Convention on Persistent Organic Polluting Agents (2002).
- f. Ramsar Convention on Wetlands (2003);
- g. Convention on the Conservation of Migratory Species of Wild Animals (2003)
- h. Convention on the Prior Informed Procedure for certain hazardous chemicals and pesticides in international trade (2003)
- i. Basel Convention on control of transboundary movements of hazardous wastes and their disposal;
- j. Kyoto Protocol to the United Nations Convention on Climate Change;

In 1996, National Agenda 21 and the National Environment Strategy and Action Plan were updated. Following the Government reshuffles of 28th March 1997 and 8th February 1999, Environment was successively placed under the Ministry of Agriculture, Animal Breeding, Environment and Rural Development and the current Ministry of Lands, Resettlement and Environment, the principal mission of which was to formulate the policy and the law relating to the protection of Environment.

Moreover, in 2001, the Ministry was strengthened by the establishment of a Ministry of State responsible for the Protection of Environment, which was operational from August 2001 till 15th November 2002. The establishment of Rwanda Environment Management Authority (REMA) is in the process of finalization. It will be the organ responsible for the execution of environment-related policies and laws.

1.2 Environment and Vision 2020

The protection and management of environment are among the pillars of Vision 2020. The objective of the Government is that by 2020, it will have built a nation in which pressure on natural resources, particularly on land, water, biomass and biodiversity, has significantly been reduced and the process of environmental pollution and degradation has been reversed; a nation in which the management and protection of these resources and environment are more rational and well regulated in order to preserve and bequeath to future generations the basic wealth necessary for sustainable development.

With regard to the protection and management of natural resources and environment, the aim of the Government of the Republic of Rwanda is to see, by 2020, the percentage of households involved directly in primary agriculture reduced from 90% to less than 50%; effective and updated regulations established which are adapted to the protection of environment and sustainable management of natural resources; the rate of diseases related to environmental degradation reduced by 60%; and the share of wood in national energy balance reduced from 94% to 50%,

In the fulfillment of this objective, particular attention will be paid to the integration of the environmental dimension in all educational, sensitization and development policies and programmes and at all levels of decision making. This will entail also the promotion of participation of grassroots communities in the management of environment with special attention to women and the youth. All the initiatives will be guided by the principles of generations and gender equality, precaution and polluter-pays so as to clearly define and establish individual and collective responsibilities.

The application of laws and regulations, the adoption and dissemination of environment friendly technologies will constitute a high priority for the central and local authorities. Finally, regional and international cooperation will be promoted and strengthened so as to contribute effectively to the protection and management of environment.

Public institutions responsible for environmental protection and management will be strengthened, and the role of the private sector and civil society will be well defined and increased with a view to a more coordinated and harmonious action in favour of the environment.

1.3 Environmental management and poverty reduction

The fight against poverty relies on sustainable economic growth and it is worth identifying the potential contribution of environment to this economic growth. Yet, the exploitation of natural resources has a direct impact on the quality of environment. The links between environmental degradation and poverty reduction have been well established. In fact, the poor depend directly on resources and natural services for their livelihood, and they are often affected by the degradation of environment, particularly water and air pollution, exposure to toxic chemical products, etc. Moreover, the poor are particularly vulnerable to natural disasters such floods, drought in the east and south-east of the country, volcanic eruptions, as well as conflicts related to natural resource control, especially land resources.

Nonetheless, poverty reduction cannot succeed without effective and real consideration of the environmental dimension. It is for this reason that Environment is one of the first priorities identified by the Poverty Reduction Strategy in Rwanda and is among the leading fundamental programmes selected within agricultural transformation and rural development.

Agricultural transformation and rural development must be accompanied by environmental protection activities such as earthworks, reforestation, water management and rational use of wetlands. The Poverty Reduction Strategy recommends also actions in the energy sector by promoting in a special way the rational use of wood and the promotion of alternative sources of energy. It supports

water supply and actions likely to enhance rain water harvesting and utilization in towns and “imidugudu” villages.

Chapter 2: RWANDA'S ENVIRONMENTAL FEATURES

In Rwanda, like everywhere else, Environment is divided in natural and human environment, and is governed by a policy, institutional and legal framework with a view to ensuring its functioning and its protection and management. Natural environment comprises the soil and the subsoil, water resources, air, biological diversity and landscape, sites and monuments, while human environment concerns land-use management and living environment.

2.1 NATURAL ENVIRONMENT

2.1.1 Geophysical features

Rwanda's physical environment can be explained partly by its geographical location in the east of Central Africa between 1°04 and 2°51 latitude south, and between 28°45 and 31°15 longitude east. Stretching over a surface area of 26,338 km² which constitutes the bedrock of the local environment, the principal geographical elements are particularly the relief, the soils, the climate, the vegetation and the hydrographic network.

2.1.1.1 Relief

Rwanda's relief presents varieties. From east to west, the altitude varies between 1000 and 4500m. The setting of this relief is composed mainly in the east by lowlands; in the centre by hills and in the west by high mountains.

- a. *The Congo-Nile Ridge*: This is a range of mountains, with an altitude ranging between 2500 and 3000m. Overhanging lake Kivu, it divides Rwanda's waters in two parts: those which flow into the Congo basin in the west, and those which flow into the Nile in the east. The Congo-Nile Ridge is dominated in the northwest by the volcanoes range which consists of five massifs, the highest of which is Kalisimbi with an altitude of 4507m.
- b. *The Central Plateau*: With an altitude ranging between 2000 and 1500m, the central plateau's relief is made of hills with tops that are sometimes stretched, sometimes round, separated by deep valleys of 50 to 15m, often filled up with alluvial deposits.
- c. *The lowlands of the East*: The lowlands are dominated by a depression of the relief, generally undulating between 1500 and 1100m of altitude.
- d. *The lowlands of the South West in the plain of Bugarama*: This is part of a tectonic depression of the African Rift, and it has an altitude of 900m.

2.1.1.2 Climate

Rwanda enjoys a temperate continental tropical climate. The thermal rhythm is relatively consistent. In the course of the year, temperatures vary between 16° and 17°C in the high altitude region, between 18° and 21°C in the Central Plateau, and between 20° and 24°C in the lowlands of the East and West. Annual rainfall varies between 700mm and 1400mm in the lowlands of the East and West, between

1200mm and 1400mm in the Central Plateau, and between 1400mm and 2000mm in the high altitude region.

The rainfall regime has a strong influence on the hydrological regime. There are floods during the long rainy season from March to May, and they subside during the long dry season of June to September.

Rwanda has increasingly been experiencing long periods of drought which tend to become cyclical and persistent, particularly in the East and South East. These climatic changes may have a direct relationship with those recorded in the world due particularly to the global warming of the planet.

2.1.1.3 Hydrography

Rwanda has an abundant water system situated on either side of two hydrographical basins, namely the Congo and the Nile basins. The Congo basin consists of insignificant and short rivers which flow into Lake Kivu. The Rusizi river is its outflow into Lake Kivu. Its principal tributary, the Ruhwa, marks the border between Rwanda and Burundi in the western part of their common border, while the Sebeya in the north flows into Lake Kivu at Gisenyi.

The Nile basin covers the greatest part of the country. Most rivers, namely the Nyabarongo and the Akanyaru with their numerous tributaries form, downstream from Lake Rweru, the river Akagera. They are closely associated with vast marshes and numerous shallow lakes found along these rivers.

2.1.1.4 Vegetation

The vegetation varies according to the relief and the distribution of the rainfall. There is a whole plant diversity from the dense forests in the West to the semi-arid savannah of the East.

2.1.2 Natural resources and Biodiversity

2.1.2.1 Soil and subsoil

In Rwanda, land is a resource of inestimable value. It occupies a first-rate place in the national economy since farming employs more than 90% of the working population and contributes about 93% of exports. However, out of a surface area of 26,338 km², 52% only is usable, representing approximately 1,385,000 hectares. Marshes suitable for agriculture would add to this about 165,000 hectares. Land is therefore a limited hence coveted resource.

In 1998, the cultivated area was estimated at 825,000 hectares, representing 60% of the land suitable for cultivation. At the moment, the cultivable area available for each family is about 0.60 ha per household, and this leads to overfarming and often misuse of land, with the harmful consequences on land resource and environment in general.

Rwanda's pedology is characterised by six types of soil:

1. Soils derived from schistose, sandstone and quartzite formations, representing about 50% of total soils.
2. Soils derived from granite and gneissic formations, representing about 20% of total soils;
3. Soils derived from intrusive basic rocks, covering hardly 10% of the national territory;
4. Soils derived from recent volcanic materials, occupying 10% of the territory;
5. Soils derived from old volcanic materials, occupying 4% of the territory;
6. Alluvial and colluvial soils, a feature of marshes in Rwanda, occupying 6% of the territory.

Rwanda's subsoil contains deposits of ore such as tin ore, wolfram, colombo-tentalite, gold, all of which are exploited on a small-scale. It also has industrial minerals and building materials which are also exploited using traditional methods. From 1999 to 2001, the mining sector played an important role in the national economy in the following proportions: export earnings: 1999: 5.9%; 2000: 12.58%; 2001: 42.64%. In 2001, mining took the second position after coffee.

2.1.2.2 Wetlands

Rwanda's wetlands consist of marshes, lakes and rivers and water courses and represent about 14.9% of the national territory, including 6.3% for marshes and 8.6% for lakes, rivers and permanent or seasonal fresh water pools.

In the high altitude region of the north west are found lakes Bulera and Ruhondo and the marshes of Rugezi. In the central and eastern parts of the country are found big marshes of Nyabarongo, Akanyaru and Akagera. Several deep lake basins communicate with these rivers and most of them are found in the Akagera National Park. From south-east to north-west are found lakes Cyohoha Sud, Mugesera, Rweru, Sake, Cyambwe, Ihema, Milindi, Rwanyakizinga, Kivumba, etc.

Wetlands have several functions and provide numerous services to man, some of which are floods water control and replenishing underground water. They constitute also biological diversity reservoirs.

2.1.2.3 Forests and protected areas

Rwanda is covered by varying ecosystems: natural ecosystems consisting of mountain rainforests, gallery forests, savannah, wetlands and aquatic areas and man-made reforestation. All these ecosystems host a wealth of flora and fauna.

a. Protected areas and natural reserves

Rwanda's protected areas consist of the Natural Forest of Nyungwe, the Volcanoes National Park and the Akagera National Park, while natural reserves are the natural forest of Mukura and the forests of Cyamudongo, Busaga and the savannah of the east. It should be pointed out that the natural forest of Gishwati has virtually disappeared.

(i) Natural Forest of Nyungwe

Dominating the shores of lake Kivu in the south west of Rwanda, the forest of Nyungwe, which is adjacent to the national park of Kibira in Burundi, is probably the largest mountain rainforest in the whole of Africa, with a surface area of 924 km² in 2000.

It stretches at an altitude ranging between 1600 and 2950 m and shelters a complex mosaic of types of vegetation. This rich variety of flora is accompanied by an equal variety of fauna, including several species of birds and primates.

Nyungwe natural forest is also one of Rwanda's water towers: it contributes up to 60% of the country's water and, moreover, it is here that the source of the Nile is found.

(ii) Volcanoes National Park

The Volcanoes National Park stretches in the southern part of the volcanoes range which constitutes Rwanda's northern border with the Democratic Republic of Congo and Uganda. It is characterized by a high altitude alpino-african vegetation, a heavy rainfall and cool temperatures. The Park is the sanctuary of mountain gorillas (*Gorilla Gorilla Beringei*). There are other endemic and CITES internationally protected species, and it hosts several species of plants, mammals, birds, reptiles, amphibians and arthropods.

(iii) Akagera National Park

The Akagera National Park is situated in the eastern part of the country. It covers a surface area of about 90.000 ha and shelters several species of plants, big mammals, amphibians and reptiles.

(iv) Forest outliers and savannah of the East

Forest outliers found around the Akagera National Park accommodate a range of endemic and rare species mostly used in traditional medicine.

b. Afforestation

Man-made forests started between 1920 and 1948 and consist mainly of Eucalyptus, but agroforestry species such as *Grevillea*, *cedrella*, *calliandra* have been increasingly gaining ground.

c. Agro-ecosystems

Agro-pastoral space covers more than 70% of the country. All the arable land is used for agriculture and animal breeding. There are permanent crops of different species and varieties. In Rwanda, there are mainly food and industrial or export crops.

Local species are still found in the agro-system, but most of the cultivated species and varieties are of foreign origin or imported from abroad. As for animal breeding, it is mostly extensive and traditional and is carried out at the family level. However, among the breeds kept in Rwanda, there are foreign breeds both for cattle and goats.

2.1.2.4 Biodiversity

Biodiversity in Rwanda is rich and varied. There is a variety of plant and animal species, some of which appear on the list of internationally protected species by the Washington Convention commonly known as CITES (Convention on International Trade of Endangered Species).

- (i) In the forest of Nyungwe, there are 1250 plant species, including 50 fodder species, 133 orchids, 275 birds species 24 of which are endemic.
- (ii) In the Volcanoes National Park, there are 245 species of plants 13 of which are internationally protected orchids, 115 species of mammals, including the mountain gorillas estimated at more that 650, 187 species of birds, 27 species of reptiles and amphibians, 33 species of anthropods.
- (iii) In the Akagera National Park, there are 900 species of plants, including 6 orchids, 500 species of birds, 9 species of amphibians, 23 species of reptiles.
- (iv) In the gallery forests, there are endemic and rare species, particularly those used in traditional medicine and modern pharmacopeia.
- (v) In wetlands, there are about 104 species of flowers and several species of fauna.

2.1.2.5 Energy resources

Energy needs in Rwanda are met from several sources of varying importance. However, biomass is the principal source of energy since it meets 94% of national needs. Wood fuel and plant residues are used for cooking and in industries and cottage industries as a source of primary energy.

The development of methane gas of lake Kivu represents a primary option because it will provide a substitution to traditional sources of energy, wood and charcoal, as well as the production of nitrogen fertilisers. Rwanda has peat reserves estimated at 155 million tonnes which can be used also to replace wood, charcoal and fuel oil.

With regard to solar energy, the country has enough sun which represents an interesting source both for rural electrification and drying needs. The wind energy potential has not yet been assessed to date; the alternative of substitution biomass, mainly the papyrus, faces competition from the requirements of intensive agriculture.

The country has numerous water courses favourable to the construction of micro-power stations.

2.2 HUMAN ENVIRONMENT

2.2.1 Socio-demographic and economic features

2.2.1.1 Socio-demographic data

To day, Rwanda has a population of 8 162 715 inhabitants on a surface area of 26 338 km², representing a physical density of 309 inhab/km² (*Population and human settlement census, August 2002*), one of the highest densities in Africa, in a country without natural resources and whose level of technology is still low.

Taking into account that the surface area actually used is no more than 18 740 km², the physiological density is 433 inhab/km².

Rwanda is therefore among the most populated countries in Africa where population growth exerts enormous pressure on natural resources, in particular on arable land and forests, and where the illiteracy rate is still very low, with a low health rate and still inadequate basic infrastructure such as water, electricity, transport and communications means and health centres.

2.2.1.2 Economic aspects

From the economic point of view, Rwanda is one of the poorest countries in the world. Its economy is basically agricultural. More than 90% of the population depend on peasant subsistence agriculture which contributes 40% of GDP estimated at 210 US\$ in 2000 and 90% of export earnings. The industrial sector is still in its early stages.

The secondary sector employs 2% of the working population, 0,2% of whom are women. The services sector employs not more than 6.6% of the population, 4.1% of whom are men and 2.5% women. The informal sector represents 79,80% of employment and the public and parastatal sector represents only 2,4% in the town of Kigali. The unemployment rate continues to rise and sources of monetary income are increasingly becoming rare. Economic conditions of the population are becoming worse and poverty is steeply rising.

2.2.1.3 Human settlements

Human settlements constitute the basic physical infrastructure for the overall development of the country. In Rwanda, there are rural human settlements and urban human settlements, both of which are characterized by unplanned occupation of space.

a. Rural settlements

For years, rural settlements in Rwanda have been and continue to be scattered in some regions of the country. For a long time, they have been characterized by unplanned occupation of space, thus doing harm to environment by wastage of land and soil erosion. However, in December 1996, the Government adopted a national human settlement policy aimed at establishing an improved rural human settlement model, grouping settlements in villages generally known as IMIDUGUDU, which meet the criteria of environmental viability through the reorganization of the national space, land reform, improved housing quality, etc.

b. Urban settlements

The urbanization policy, which is in the course of finalization, aims at discouraging the proliferation of unplanned residential areas with a view to improving sanitary and security conditions, providing decent houses and socio-economic infrastructure. Commendable efforts have been made in the development of town master plans aimed at resolving problems caused by unplanned residential areas, while meeting the requirements of modern urbanization, taking into account environmental concerns.

2.3 Institutional and legal framework

It could be said that from the institutional and legal point of view, there exists no law on environment. However, different legal texts found here and there protect environment and define the management framework of some aspects of environment. There are thus the law on wood and forests; three articles of the criminal code relating to the management of natural resources such as water, land and wood; the law on the soil conservation; the law on dangerous and unsuitable human settlements; the law on fisheries; the law on pollution and contamination of water sources, lakes, water courses and parts of water courses. There are also texts relating to the protection and management of protected areas, natural reserves and a mining code. It is however worth noting that this is certainly going to change with the New Constitution adopted through the Referendum of 26 May 2003 which, in its Article 46, clearly enshrines the protection and conservation of environment.

There are also bills: particularly the bill on water, the draft sanitation code, the bill on the creation of Nyungwe National Park, the bill on land scheme, the bill on the review of the borders of Akagera National Park, the bill on the development of marshland, the bill on industry and trade.

International conventions relating to environment have been signed and ratified and others will be signed and ratified soon. Rwanda participates also in regional initiatives in the protection and management of environment such as the Nile Basin Initiative, the Common Market for Eastern and Southern Africa (COMESA), the Lake Victoria Biodiversity Programme and the New Partnership for Africa's Economic Development (NEPAD).

At the institutional level, the Ministry for Land, Resettlement and Environment is responsible for the formulation of policies and laws aimed at the protection and rational use of environment. The same Ministry is also responsible for coordinating and monitoring all the activities carried out in the country by different stakeholders and development partners which can have some impact on Environment.

Other Ministries are involved such as the Ministry of Agriculture, Livestock and Forests (MINAGRI), the Ministry of Industry, Commerce, Public Investment Promotion, Tourism and Cooperatives (MINICOM), the Ministry of Infrastructure (MININFRA). There are also public institutions such as Rwanda Authority for Tourism and National Parks (ORTPN), Rwanda Bureau of Standards (ORN), as well as higher teaching and research institutes: National University of Rwanda (UNR), Kigali Institute for Science, Technology and Management (KIST), Rwanda Institute for Agricultural Science (ISAR), Institute for Scientific and Technological Research (IRST). Non Governmental Organisations, both local and international, as well as Cooperating Agencies/Organisations are also involved. These are: Global Environment Facility (GEF), United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), United Nations Food and Agriculture Organisation (FAO), United Nations Children's Fund (UNICEF), World Bank, etc.

Chapter 3. ENVIRONMENTAL PROBLEMS

Rwanda's environmental problems are associated mainly with bad management of natural resources such as land, forests and water. There are also problems caused by industrial, commercial and human settlement activities and various pollutions. The production and management of waste constitute also a challenge to environment quality, particularly in urban areas.

3.1 Degradation of natural resources and biodiversity

3.1.1 Population and resources imbalance

The major environmental problem in Rwanda is the imbalance between the population and natural resources (land, water, flora, fauna and other non renewable resources) which have been degrading over decades. This degradation is reflected through massive deforestation, the reduction of biodiversity, the cultivation of marginal areas, the erosion and unplanned cultivation of marshes.

The imbalance between the population and natural resources has resulted in a constantly increasing impoverishment of the population. In 1993, the proportion of households living below the poverty threshold was 53%. It greatly increased after the 1994 war and genocide. Surveys carried out in 2001 show that at the national level, 60% of households live under the poverty threshold.

3.1.2 Land degradation

The degradation of land in Rwanda is happening at a worrying speed. The current situation is alarming. There are several causes for this. There are natural and/or structural causes first, and there are also man-made causes.

3.1.2.1 Natural causes

a. Causes of a pedological nature

From their pedogenesis, Rwanda's soils are fragile and therefore vulnerable and very sensitive to erosion.

b. Causes of a geomorphological nature

Rwanda is characterized by an uneven relief with a physiographical configuration formed of steep slopes exposed to erosion.

c. Causes of a climatic nature

Rainfall in Rwanda is governed by altitude. Annual rainfall increases from East (900mm) to West (1600mm). High rainfalls expose steep-sloped soils to water erosion, and low rainfalls expose lowlands to high insolation.

3.1.2.2 Man-made causes

a. Population pressure due to agricultural land needs

The use of land for agriculture occupies more than 90% of the population. Today, the physical population density in Rwanda is about 309 inhabitants/km² and the physiological density is more than 430 inhabitants/km².

As a result of the high population pressure, there is a rapid reduction of the size of farmland for families. This land shortage has led to the occupation and cultivation of land which is unsuitable for agriculture. Crops are planted on slopes and occupy up to more than 80% of land recognized as more marginal, marshland and protected areas.

Erosion due to cultivation on excessively steep slopes without any techniques for erosion control or soil and water management and conservation, together with their excessive cultivation make soils in Rwanda prone to continuous degradation. Land losses are considerable and are estimated at between 0 and 557 tonnes/ha per year.

b. Scattered settlements and excessive land parcelling

The prevailing mode of scattered human settlements in Rwanda is the source of wastage of land which is supposed to be suitable for agro-pastoral activities.

In addition, scattered human settlements enhance erosion as a result of the many paths joining households and the lack of systems for the collection and drainage of wastewater and rain water.

Excessive land parcelling as a result of land heritage had contributed to the miniaturization of plots to such an extent that farmers no longer practice fallow and no longer manage to meet their basic nutritional needs. This crisis situation contributes to the exhaustion of land resources and accelerates its deterioration and, indirectly, the degradation of environment.

c. Bad farming practices and overgrazing

The methods and techniques used for soil conservation have given priority to soil protection at the expense of the improvement or restoration of soil fertility of the hill land. This inadequacy of modern farming techniques for land development and rational management of land resources leads to frightening erosion.

Concerning marshland, a comprehensive analysis of the problem of wetlands in Rwanda shows that, in general, they are mismanaged and used in a disorganized manner for agricultural and quarrying purposes without prior studies of the impact on water resources and human health.

The destruction of lake shores and river banks has led to the sapping of shores, resulting in silting up and inverted soils due to inflow of new materials deposited by water erosion from neighbouring watersheds.

Overgrazing affects particularly the eastern regions of the country where cattle treading promotes the degradation of the soils already weakened by severe sunny

periods and facilitates the progression of the desert. As a result, there is a very extensive degradation of the soils and serious loss of their fertility as well as increased water and wind erosion.

d. Anarchical exploitation of mines and quarries

Mining and quarrying activities carried out in the different parts of the country affect the soils of the hills and marshes. They contribute to increased erosion on hills where quarries that have been left open promote erosion, together with the drying up of marshland, lakes and rivers.

e. Deforestation and abandonment of the system of erosion control

Massive deforestation, combined with the abandonment and the destruction of erosion control systems, particularly following the displacement of the population caused by the 1994 war and genocide, contribute greatly to the degradation of the bare land on steep slopes and hills.

3.1.3 Loss of biodiversity

The principal threats to biodiversity are reflected through the destruction of biotopes; poaching, pirating and illicit trade; uncontrolled introduction of exotic species and overexploitation of biological resources.

a. Destruction of biotopes

The destruction of biotopes is the result of the clearing of biodiversity habitats, including natural forests, protected areas and wetlands for various reasons. It is caused by agricultural and pastoral activities, and collection of species for crafts, medicinal and other purposes.

The destruction of biotopes leads to the modification of the flora and fauna of affected ecosystems. Some plant and animal species become extinct all together, others decrease significantly. When reduction of biotopes is accompanied by poaching acts and fires, then the situation becomes worse. The spatial reduction of biotopes is worrying because Rwanda has lost more than 50% of its natural forests over a period of 40 years, between 1960 and 1999. At the national level, the regression rate amounts to 69%. The forest cover rate is about 18% (MINAGRI 2002) with a reforestation rate of about 1/20 ha per capita, whereas at the world level, every inhabitant should have at least one hectare of forests.

This is how the leopard from the Volcanoes National Park and the forest of Nyungwe became extinct since 1971; the hyena, the elephant and the buffalo, once numerous in the Volcanoes National Park and the natural forest of Nyungwe, have become rare today, the giant forest hog and the wildcat as well as the African hunting dog from the Akagera National Park have become extinct; the bamboo is quickly regressing from the foot of the volcanoes, and forest species with a high economic value are becoming rare. Current researches have shown that 115 plant species are threatened with extinction in Rwanda.

b. Poaching, pirating and illicit trade

Poaching, pirating and illicit trade lead to the decrease and extinction of targeted plant and animal species. Game is either consumed in families or sold. The most targeted animals are the buffalo, the gazelle, the antelope, the wild boar, the porcupine, the duiker, the partridge, the colobus and the bamboo. Pirating and illicit trade affect often rare species and those in the process of extinction and concern generally living individuals, the remnants from the dead or trophies and genetic material.

c. Uncontrolled introduction of exotic species

The main consequences of the uncontrolled introduction of exotic species are the dominance of exotic species over native species, competition, introduction of new diseases and uncontrolled crossings. For example, the water jacinth found over the entire extent of wetlands constitutes a serious threat for their biological resources. Among the damaging effects of the water jacinth, one can cite the degradation of the quality of water since it covers water and leads to the reduction of the quantity of dissolved oxygen, PH and temperature, the direct result of this being the reduction and disappearance of the biodiversity of affected wetlands. Lake Mihindi has currently reached the final stage of silting up and drying up. *Lanthana camara* (Umuhengeri) has invaded cultivated fields, especially in the east of the country.

d. Overexploitation of biological resources and biomass

The use of some exploitation techniques and practices has consequences on the production and productivity of biological resources. For example, the fauna in wetlands is threatened by rudimentary and often destructive fishing techniques. Fishing by strike and by the use of nets with very fine meshes is detrimental to the maintenance of fishing resources and other small aquatic animals in the lakes of the eastern basin. The use of explosives and toxic products to catch fish has also been reported.

Biomass is the most used source of energy in Rwanda. In fact, 97% of households use biomass in the form of wood, charcoal, shrubs, animal dung and plant detritus for cooking and lighting. Wood is also used in schools, tea factories and other public institutions as energy.

3.1.4 Reduction of water resources

Water is increasingly becoming rare in Rwanda. The regions of Umutara, Kibungo, Mayaga, Bugesera and the volcanoes are poor in water sources and the daily water consumption is 5 litres per capita on the average, which is below the national average estimated at 8.15 litres per capita and far below the international standard of at least 20 litres per capita a day.

The destruction of the plant cover and the poor drainage of marshland have resulted in capacity reduction and water retention period, the drying up of water sources and lakes. Add to this the increasingly frequent climatic disturbances, a progressive reduction of natural water reserves in the country, and the low level knowledge of water management techniques.

All these factors contribute increasingly to the reduction of water availability given that during the rainy seasons, water constitutes a danger and causes considerable damage due to lack of rain water harvesting and conservation techniques.

3.2 Energy crisis

Wood is the most used source of energy in Rwanda. This is detrimental to environment since the excessive use of wood and charcoal causes and/or accelerates deforestation and lays the soils bare, thus making them exposed to erosion. The energy balance shows a high deficit all the more since petroleum products are imported and electricity is not available in the whole country and new and renewable energy is still out of the reach of the majority of the population.

3.3 Various types of pollutions

Pollution comes from domestic and industrial solid waste, agropastoral activities, uncoordinated mining and quarrying, as well as invading plants such the water jacinth and water lettuce.

Waste water and solid waste particularly from septic tanks, latrines, animal waste and refuse infest water, air and soil. Though not many, Rwanda's industries are almost all built in or near wetlands and throw all their effluents and by-products in water without any prior treatment. Industries also emit fumes in the atmosphere and pollute air.

Agro pastoral activities involve the use of fertilizers and the application of pesticides and herbicides which are often toxic to water, air and soil. With regard to water jacinth, water lettuce and other bad aquatic grasses, they have invaded a big part of Rwanda's aquatic ecosystems and are responsible for the degradation of water quality.

Finally, the preparation of ore using much water constitutes also a major pollutant of running water in Rwanda. Mining and quarrying activities produce massive wastes which are thrown into nature in the form of enormous heaps of soil and rocks. These are transported by rain water erosion to the valleys where water courses are filled and covered by sterile mineral masses which are harmful to vegetation.

3.4 Disasters

A disaster is defined as a total upheaval of society, causing human life, material, economic and environmental losses, and which is beyond the capacity of the affected society to face it with its own resources. There are two types of disasters which affect environment: natural disasters and man-made disasters.

3.4.1 Natural disasters

Natural disasters are those which are due to climatic or seismo-volcanic disturbances. They represent a permanent threat to our country and include drought, torrential rains, floods, land slides, earthquakes, volcanic eruptions.

3.4.2 Man-made disasters

Man-made disasters are a result of human activities and are mainly bush fires, conflicts and wars, deforestation and others.

a. Bush fires

In Rwanda, bush fires are very frequent during the dry season, especially in the eastern and south-eastern regions (Umutara, Kibungo and Bugesera). Parks and protected areas are the most affected for pastoral reasons, poaching, mining, carbonization, etc. This phenomenon is responsible for land degradation, deforestation, loss of biodiversity, etc.

b. Conflicts and wars

Since 1959, Rwanda has experienced conflicts and social crises which resulted in losses of human lives. The latest and most flagrant case is the war which plunged the country into grief since 1990 and was followed by the massacres and the genocide in 1994, with the following consequences on the environment: degradation of environment in general; massive displacements of the population which led to the degradation and modification of ecosystems; loss of skills in the field of environment and reduction of formerly protected areas.

c. Deforestation

Although this phenomenon is not considered as a disaster in general, in the case of Rwanda, it is a major man-made disaster. The case of the forest of Gishwati is a sufficient example.

d. Other disasters

Some chemical products have the characteristic of exploding under the effect of high temperatures when they are badly conserved and/or have expired. Such is the case with mancozeb which caught fire in the warehouses of Gikondo. Mention should also be made of the excessive use of toxic products, fires from various sources, particularly those linked to petrol stations, garages, industries and factories; road accidents and poor electrical installations, etc.

3.5 Poor recognition of the environmental dimension by socio-economic sectors

3.5.1 Transport and communication

Land transportation in Rwanda uses automobile vehicles on roads and auto trails. The landscape is covered with a dense network of pathways and roads. The presence of transportation routes makes this sector an environmental factor, particularly with regard to road construction, petroleum products used in

transportation, maintenance and repairs and emission of gases with greenhouse effects.

The most distinguishing negative effects of major roads on environment often concern their border areas, namely:

- earth banks, which are sometimes very high, are often subject to strong erosion, falling rocks and land slides. One frequently sees roads that are impassable during the rainy seasons due to the above mentioned effects.
- areas down the roads full of unstable and very erodable excavated material to the extent of becoming a permanent threat for houses, crops and vegetation found down below.
- water ducts built under the roads which flow into the landscape of great water bodies laden with mineral matters (mud, sand and pebbles). These waters dig big crevices along their passage towards lowlands and marshlands, causing rapid filling up as a result of strong sedimentation.
- big quarries used in the construction of roads which have been abandoned without structures nor reforestation. They disfigure the landscape and constitute very easy points of erosion.

When these roads are unsurfaced, they are always covered with clouds of dust during dry seasons which cover the surrounding areas. The exhausts of vehicles are also a source of environment pollution, more so since the fuels used contain harmful substances such as lead and sulphur.

3.5.2 Trade, Industry and Tourism

Trade, industrial and tourist activities are closely linked with environment. When they are not well carried out, they are likely to affect negatively the quality of environment. In Rwanda, there are environmental concerns linked to trade, industry and tourism.

a. Trade

Lack of environment friendly trade policies, laws and strategy as well as the non-existence of appropriate depots for the storage of trade goods and items, pharmaceutical products and other chemical by-products which are potentially toxic are prejudicial to environment safeguard.

Environment also suffers from lack of facilities and skills for inspection and monitoring of commercial activities to determine their impact on the quality of environment. The country does not have sufficient facilities for monitoring international trade of chemicals, particularly those used in agriculture and industries likely to harm human health and environment.

Furthermore, customs officers, Interpol police and officials from the Bureau of Standards and Regulation Agency are often not aware of the possible dangers of some of the traded products on human health and environment. Neither is there a regulation for the protection of consumers against the trade and consumption of

expired products or products which do not comply with the recommended international consumption standards.

b. Industry

Although industrialization in Rwanda is recent and undeveloped, it embraces several sub-sectors, of which the major ones are: agro industry; textiles; wood; chemical industries; construction industries; mining; metallurgical industries; engineering; printing and paper industries.

Almost all these industries are concentrated in the city of Kigali. Order No. 41/78 of 28 May 1956 classifies industries and workshops among the “most dangerous, insalubrious and inconvenient institutions” due to their negative effects on human health and environment. For this reason, cases of environmental pollution are found at the level of work places and surrounding environment.

An analysis of the system of establishing industries, garages and other similar places of business show that they are found everywhere, established in a disorderly manner. On one hand, uncontrolled cohabitation of industrial establishments and non-separation from residential areas constitute a threat to human health and environment. On the other, almost all the industries, garages and workshops are located in valleys or marshes bordered by heavily populated areas. Some establishments are even found in dwelling houses.

c. Tourism

The relationship between tourism and environment are many and complex. In a country without sea tourism, “discovery tourism” or “vision tourism” relies mainly on the quality of the environment and, particularly, on the originality of the natural resources. The kind of tourism which would be built on a short-term vision, aimed solely at maximizing financial revenue, could have harmful effects on environment.

This is all the more true since it is undeniable that the principal tourist attractions of the country are mainly national parks and natural forests. It is in these areas that environmental impacts will be more visible if they are intensively frequented and no protective measures are taken to correctly monitor tourists.

In fact, an outline law on tourism is yet to be made and this hinders the smooth operations of tourist activities. The Rwanda Tourism and National Parks Authority concentrates more of its efforts on tourist operations rather than on conservation of protected areas and other tourist sites. This attitude is often linked with the lack of adequate human, financial and material means such that to day, tourism is elitist and selective and does not encourage mass tourism or quality tourism which respects the quality of environment.

3.5.3 Education, Information and Research

a. Environmental education

The shortcomings noticed in this field are found at all the levels of education and relate to the poor integration of environmental education in their curricula at primary,

secondary and higher education levels, and to lack of specialized teachers in environmental education.

Efforts and initiatives for environmental education are scattered. There is no platform or forum for dialogue or harmonization of environmental education activities.

b. Information

Information plays an important role in creating awareness and raising the consciousness of the population to the problems of environment and in the change of habits vis-à-vis environment.

In Rwanda, the most utilized ways of informing the population are the radio, the press, film videos, posters. At the moment, the role of information is the responsibility of Office Rwandais de l'Information (ORINFOR).

The public and private services in charge of information do not always receive sufficient funds for the production of certain messages considered efficient through films, books and articles on environment. The same applies to journalists who disseminate messages related to environment. It is generally only non professionals who are concerned with environmental issues.

c. Research

To day, research in the field of environment is carried out mainly in the following three public institutions:

- Institut des Sciences Agronomiques du Rwanda (ISAR)
- Institut de Recherche Scientifique et Technologique (IRST)
- National University of Rwanda

Some research activities are also carried out in some Ministries and Government offices. However, activities carried out by these institutions cover some sectors only such as the agricultural, medical, energy and biological sectors. Themes relating to the management of environment are addressed in an incongruous manner due to lack of a national research programme in the field of environment and unavailability of staff. In addition, the research carried out in 1992 established priority environmental research themes, but it is not up to date.

3.5.4 Health and human settlement related problems

3.5.4.1 Human settlement

Rural areas are dominated by scattered human settlements. Inappropriate spaces are used for agriculture, trees are planted in lowlands and other agricultural areas, watersheds and fragile wetlands are used in disorganized manner due to lack of a

Land Development Master Plan and explicit land policy and law governing the land tenure system and human settlements. As a result of this management, there is soil degradation, reduction of water resources, devastating floods, etc.

In urban areas, the population has grown from 7% in 1993 to 18% of total population in 2002. Realistic assumptions put the urban population to 30% of total population by 2020. Annual urban needs are considerable in terms of housing, infrastructure and facilities in Rwanda.

The country's urbanization faces the following problems:

- weakness in urban planning and in implementation of planning tools;
- weak urban infrastructure;
- uncoordinated management of human settlements;
- limited financing resources.

3.5.4.2 Health

The analysis of the health sector shows a health level that is still low in the country, whether in terms of infant diseases control, reproductive health, malnutrition, access to medical care and malaria.

In rural areas, in towns and in settlements, one still finds rubbish in the streets and in the homes. Wastewater is often poured in the yard. This situation shows that in terms of attitude and hygienic and sanitation practices, the population is not sufficiently informed or sensitized.

Many dwelling houses in rural areas shelter various parasites, rodents and other disease vectors. No precautions are taken to protect drinking water, and consumption of unfit water for human consumption is the cause of many water borne diseases. Disorderly building of houses in towns without provision for disposal of wastewater and rain water worsens the problems of sanitation. These waters destroy public roads and stagnate, thus becoming the favourable sites for the breeding of mosquitoes and other vectors of human and animal diseases.

3.5.5 Economic planning

Rwanda's economy has since long depended on agriculture and animal breeding the production of which is directly linked to the fluctuations of climatic conditions. The main questions raised focus on the identification of better ways of raising income through the harnessing of factors with a view to increasing production; guaranteeing of macro-economic stability by overcoming fiscal and external imbalances; and the reduction of expenditure in relation to the external debt.

This economic situation does not cater adequately for the protection of environment because the majority of the population are more concerned with survival without thinking about the future. The State too allocates available resources according to national priorities and often, the share earmarked for the protection of environment is not enough considering the challenges ahead. Furthermore, environmental costs are not included in the development budgets.

3.6 Environmental problems of an international scope

Environmental problems are found in the countries the world over. Among these problems are some which are the most salient and require the mobilization of efforts and the collaboration of nations with a view to finding adequate solutions together. The most common are those linked to climatic changes and the destruction of the ozone layer.

3.6.1 Climatic changes

During the 1980s, the world faced the problem of world warming. Human activities, particularly industries and means of transport emit greenhouse gases which, in turn, cause the warming of the planet. In order to solve this problem, the countries of the world negotiated and signed the United Nations Convention of Climatic Changes in June 1992.

Rwanda signed this convention on 10 June 1992 and ratified it on 18 August 1998. In the implementation of this convention, the country is preparing the first national paper on climatic changes with the technical and financial assistance of the Global Environmental Fund. Once this initial paper is finalized, it will be followed by the preparation and the adoption of the National Action Programme for adaptation to climatic changes with a view to contributing to the alleviation of the harmful effects associated to climatic changes.

3.6.2 Ozone layer depletion

The depletion of the ozone layer has been observed since 1980s. Polar regions have been the most affected by this phenomenon. The depletion of the ozone layer results in increased intensity of ultraviolet radiation on the earth and threatens the health of living things. Ultraviolet radiation may cause skin cancer, blindness, reduction of body immunity and affects and/or destroys fauna and flora species.

Rwanda supports the efforts of the international community aimed at reducing and eliminating the consumption and production of substances likely to deplete the ozone (SAO). It is in this framework that Rwanda ratified the Vienna Convention on the protection of the ozone layer and the Montreal Protocol relating to substances which deplete the ozone layer on 11/10/2001. It intends to adhere to all the amendments relating to the Montreal Protocol. With the support of the Multilateral Fund for the implementation of the Montreal Protocol, the Government launched in 2002 a project for institutional capacity building in this field as well as the development of the country programme for the elimination of SAO.

3.7 Gender and youth problems in environmental protection

In Rwanda, women account for more than 52% of the population according to the 2002 general population and human settlement census. Women are the principal actors in the agricultural sector since the rate of women activities in the primary sector is 52.3% compared to 38.8% for men (MINECOFIN, 1998).

In addition to agricultural activities, rural women in Rwanda are involved in various other activities such as household activities, child education and child care, hygiene and cleanliness of the environment. Just like the rural women, the urban women

combine production activities in the formal or informal sectors, with domestic chores, child bearing, child education and child care.

All these activities bring women in direct and regular contact with environment. Through these activities, women play a crucial role in the management of land, forestry and water resources. Yet the means put at their disposal are not measure up to the tasks assigned to them. In fact, poverty has been feminized, the majority of the poor being women who often are homeless or live in inadequate dwellings or in precarious conditions where they fight for survival without thinking about tomorrow or the protection of environment.

The same goes with the out-of-school and idle youth who are often left to themselves. And yet, the youth represent more than half of the population of Rwanda and should constitute a potential force for sustainable environment friendly development.

Measures should be taken to raise the living standards and understanding of this so important category of the population so as to enable women and the youth to play their full role in the management of natural resources and environment.

3.8 Weak policy, institutional and legal framework

Lack of an outline law for the protection and management of environment, combined with the weakness of institutions responsible for environment, have also contributed to the degradation of environment. Legislative and regulatory shortcomings and the inadequacy of some policy legislations and sectoral strategies have enhanced unsustainable exploitation of natural resources and slowed down the implementation of conventions, protocols and agreements in the field of environment.

From the institutional and national capacities point of view, the main constraints for a rational management of the environment include the lack of a comprehensive vision of environment management in the establishment of structures, the departmentalization and duplication of decision making centres with the fragmentation of roles and responsibilities; the absence of synergies of action at the sectoral level, low capacity in terms of material, human and financial resources; institutional instability of the department of environment; the absence of a permanent technical structure for the coordination, monitoring-evaluation of environment management and lack of experience by decentralized institutions in the management of environment.

From the policy, social and economic point of view, the impoverishment of the population and the degradation of the conditions of living, the social and political crises as well as the low capacity and level of education among the population enhance behaviours and customs which are not environment friendly.

Chapter 4. PRINCIPLES AND OBJECTIVES OF THE NATIONAL ENVIRONMENT POLICY

4.1 General policy principles

In order to find solutions to the above mentioned problems and ensure the protection and sustainable management of the environment, ten principles should be kept in mind:

- (i) Every individual has the right to live in a healthy and balanced environment and has the obligation of safeguarding environmental health;
- (ii) Economic growth in Rwanda should be based on a more rational utilization of resources and take into account the environmental dimension;
- (iii) Active and effective participation of the entire population in the protection and management of environment;
- (iv) Special attention should be paid to educational and awareness creation programmes in environment at all levels with a greater involvement of women and the youth;
- (v) Introduction of the principle of prevention;
- (vi) Introduction of the principle of polluter-pays
- (vii) Environmental impact should be analyzed during consideration of developmental projects;
- (viii) The principle of equality among generations and fair share in the utilization of resources should be respected;
- (ix) Establishment of a favourable social and economic environment for the utilization of natural resources;
- (x) Recognition of sub-regional, regional and global environmental interdependence.

4.2 Overall objective

The overall objective of the Environment Policy is the improvement of man's well-being, the judicious utilisation of natural resources and the protection and rational management of ecosystems for sustainable and fair development.

4.3 Specific objectives of the policy

The policy aims at the following specific objectives:

- (i) to improve the health and the quality of life for every citizen and promote sustainable socio-economic development through rational management and utilization of resources and environment;

- (ii) to integrate environmental aspects into all the development policies, in planning and in all activities carried out at the national, provincial and local level, with the full participation of the population;
- (iii) to conserve, preserve and restore ecosystems and maintain ecological and systems functioning, which are life supports, particularly the conservation of national biological diversity;
- (iv) optimum utilization of resources and attain a sustainable level of consumption of resources;
- (v) to create awareness among the public to understand and appreciate the relationship between environment and development;
- (vi) to ensure the participation of individuals and the community in the activities for the improvement of environment with special attention to women and the youth;
- (vii) to ensure that the basic needs of today's population and those of future generations are met.

Chapter 5. POLICY STATEMENTS AND STRATEGIC ACTIONS

In the light of the above mentioned overall objective, specific objectives and general principles, the policy statements that should be given weight and the strategic actions to undertake are as follows:

5.1 Population and Land-use Management

5.1.1 Policy statement

Balance the national policy in terms of population, land-use management and environment.

5.1.2 Strategic actions

- (i) to develop a rational policy for space management in rural areas;
- (ii) to develop or update master plans and special plans for land-use in urban areas;
- (iii) to continue with the reorganization process of the scattered human settlements into grouped settlements (imidugudu) through the creation of developmental poles equipped with basic infrastructure;
- (iv) to train, educate, inform and create awareness of the public in population, management of natural resources, environment and family planning.

5.2 Natural Resources

5.2.1 Land

a. Policy statement

To ensure that land, which is the major resource of the country, is not degraded and used in an unplanned manner.

b. Strategic actions

- (i) to speed up the adoption of the land policy and law and prepare an action plan for their implementation;
- (ii) to ensure that land is used rationally;
- (iii) to prepare a Land Development and Utilization Master Plan;
- (iv) to ensure the protection and conservation of soils against any form of degradation;
- (v) to sensitize the population in land policy and regulations.

5.2.2 Water Resources

a. Policy statement

To ensure that water is used in the various economic and social sectors without endangering environment.

b. Strategic actions

- (i) to take necessary measures with a view to maintaining the balance of hydro-ecological processes;
- (ii) to put in place measures for the prevention of the degradation of the environment around water points;
- (iii) to control the gradual decrease of natural water reservoirs (vegetation-forest-marshes cover);
- (iv) to ensure that developmental projects include prior studies of environmental impact which will highlight the costs and benefits of the protection of watershed and other underlying ecosystems;
- (v) to promote an integrated approach by governmental and non governmental agencies involved in the implementation of protection measures of watersheds with a view to reducing erosion, silting, pollution by colluvial deposits, deforestation and other harmful factors;
- (vi) to control the water hyacinth and other invading plants;
- (vii) to promote programmes for the harvesting, storage and use of rain water;
- (viii) to promote regional cooperation in the management and equitable utilization of cross-border waters;
- (ix) to ensure compliance with the regulations on water quality and waste management.

5.2.3 Wetlands

a. Policy statement

To improve the conservation and management of wetlands.

b. Strategic actions

- (i) to develop a policy and a legislation on the conservation and use of wetlands;
- (ii) to develop a master plan for the development and conservation of wetlands;

- (iii) to draw up an inventory and characterize the components of the diversity of wetlands;
- (iv) monitoring and evaluation of the state of wetlands;
- (v) to introduce measures for the protection of watersheds with a view to prevent the degradation of marshes;
- (vi) to determine the marshes to protect and the marshes to use;
- (vii) to maintain all the marshes as public and private property of the State and entrust their management to the Government.

5.2.4 Forests and Protected Areas

a. Policy statement

To improve the conservation and management of forests and protected areas.

b. Strategic actions

- (i) to promote the conservation of the forestry heritage;
- (ii) to strengthen programmes for the formulation of forestry development and management plans;
- (iii) to enhance better utilization and development of forestry products through the promotion of wood processing units by private enterprise;
- (iv) to use marginal land for the promotion of reforestation programmes with a view to the protection and conservation of bare hills;
- (v) to involve the resident population in the rehabilitation, protection and conservation of natural forests;
- (vi) to study and put in place mechanisms for the prevention and control of bush fires;
- (vii) to enhance the rehabilitation of degraded ecosystems and the restoration of threatened species.

5.2.5 Biodiversity

a. Policy statement

To ensure the conservation and sustainable utilization of biodiversity of natural ecosystems and agro-ecosystems in compliance with the equitable share of benefits derived from biological resources.

b. Strategic actions

- (i) to make an inventory of endemic native and/or less known species of economic importance;
- (ii) to conserve in situ and ex situ the native genetic heritage;
- (iii) to ensure the development of alternatives for the exploitation of biodiversity;
- (iv) to conserve the genetic diversity of native plant and animal species;
- (v) to develop mechanisms for the control of imports and the dissemination of genetic materials;
- (vi) to implement identified action plans for the conservation of biodiversity in the National Strategic Plan on Biodiversity;
- (vii) to ensure the rehabilitation of sites after mining and quarrying activities.

5.3 Socio-economic Sectors

5.3.1 Agriculture, Livestock and Fisheries

a. Policy statement

To promote environment friendly agro-pastoral and fishing methods and techniques.

b. Strategic actions

- (i) to develop environment friendly agricultural production systems;
- (ii) to reactivate agricultural inputs national programmes with a view to increasing agricultural production while complying with environment;
- (iii) to create awareness among the population on the impact of agricultural inputs;
- (iv) to relieve the agricultural sector by the creation of non agricultural employments;
- (v) to enhance the practice of livestock stabling;
- (vi) to ensure that animal breeding does not exceed the capacity of grazing land;
- (vii) to promote environment-oriented irrigation;
- (viii) to develop off-land animal breeding around towns and along roads;

- (ix) to regulate the importation of exotic breeds and the movement of domestic animals;
- (x) to regulate and improve fishing techniques and methods with consideration to environment.

5.3.2 Transport and Communications

a. Policy statement

To ensure compliance with environment in all transport and communications activities.

b. Strategic actions

- (i) to ensure that land, lake and air transport regulations minimize pollution;
- (ii) to prevent air and soil pollution by emissions of gases and heavy metals from transport equipment;
- (iii) to ensure the protection of areas bordering roads;
- (iv) to protect the population against noise nuisances and dangers from air, lake and land transport;
- (v) to fight noise pollution by communication media (radio, portable telephones, television sets....);
- (vi) to promote the use of non polluting sources of energy in the field of communication (replacing cell batteries...).

5.3.3 Trade, Industry and Tourism

a. Policy statement

To integrate environmental aspects in commercial and industrial activities and promote environment friendly tourism.

b. Strategic actions

- (i) to control the quality of local and imported products;
- (ii) to regulate the location and management of industrial and market sites;
- (iii) to establish a system of information on prohibited, controlled products and potentially toxic products;
- (iv) to encourage the use of biodegradable packing products and the recycling of waste matter;
- (v) to regulate the trade of fauna and flora products and their by-products;

- (vi) to control hygiene and cleanliness of markets, business areas and industrial sites;
- (vii) to promote less polluting transport and storage technologies and technologies for the elimination of industrial products and/or waste;
- (viii) to enhance the development of ecological tourism (ecotourism);
- (ix) to create awareness among tourists on the importance of environment quality.

5.3.4 Energy and Mining

a. Policy statement

To increase energy supply while minimizing the negative impact on environment and ensure compliance with the environmental dimension in mining and quarrying activities.

b. Strategic actions

- (i) to promote diversification and utilization of alternative sources of energy (methane gas, solar, wind) and micro-hydro-electricity;
- (ii) to ensure compliance with security standards in the production, transport and distribution of energy;
- (iii) to ensure compliance with international standards in the emission of greenhouse gases due to utilization of energy;
- (iv) to regulate exploitation of mineral resources so as to protect environment;
- (v) to regulate the treatment of mineral waste so as to limit or eliminate water pollution if possible.

5.3.5 Education, Information and Research

a. Policy statement

To give the country an educational, information, sensitization and environmental research promotion policy.

b. Strategic actions

- (i) to include environmental studies in school curricula at the primary, secondary and tertiary level;
- (ii) to strengthen human and institutional capacities in the field of environment;
- (iii) to create awareness among the population in environmental protection;

- (iv) to promote environmental research and transfer of surveillance technologies;
- (v) to facilitate access to the findings of environmental research.

5.3.6 Health and Sanitation

a. Policy statement

To include health and sanitation at the centre of environmental issues.

b. Strategic actions

- (i) to establish a system for collection, transportation, repository and disposal of waste;
- (ii) to formulate a national strategy for specific management of chemical products and biomedical and industrial waste;
- (iii) to establish protection standards between dumping grounds and human settlements and water sources;
- (iv) to develop and strengthen institutional and technical capacities for the management, control and monitoring of unsuitable products;
- (v) to establish an appropriate system for the conduit and disposal of waste water and rain water in towns and in settlements (Imidugudu);

5.3.7 Economic Planning

a. Policy statement

To integrate the environmental dimension in economic planning.

b. Strategic actions

- (i) to take into consideration the impact and the cost of environment in socio-economic planning;
- (ii) to mobilize and allocate the necessary financial resources for the protection of environment;
- (iii) to ensure the inclusion of the environmental dimension in socio-economic developmental projects and programmes.

5.4 Atmosphere, Climate and Disasters

a. Policy statement

- (i) to take part in the establishment of a framework for early warning and management of natural and/or man-made disasters;
- (ii) to contribute to the establishment of a policy and legislation aimed at monitoring regularly climatic changes and reduce to the strict minimum substances which pollute the atmosphere.

b. Strategic actions

- (i) to create a database on disasters;
- (ii) to strengthen the structures for the comprehensive management of disasters;
- (iii) to create a preventive early warning system;
- (iv) to implement the regulations relating to the prevention and management of disasters;
- (v) to strengthen the meteorological and agro-meteorological monitoring systems;
- (vi) to develop a policy for the control of socio-economic activities likely to affect the climate.

5.5 Gender, Youth and Environment

a. Policy statement

To mainstream gender in the protection of environment.

b. Strategic actions

- (i) to ensure the involvement of men and women in the protection of environment;
- (ii) to alleviate the tasks of housewives, especially in rural areas;
- (iii) to improve the economic and social conditions of poor households, especially those headed by women and children;
- (iv) to facilitate access of women to natural resources and empower them to control their management;
- (v) to sensitize the youth from their early age in the protection of environment;
- (vi) to train and steer the youth towards non agricultural employment so as to alleviate pressure on natural resources and environment.

Chapter 6. POLICY IMPLEMENTATION

The environment policy covers several sectors of activity. Its implementation involves all the stakeholders in the social, political and economic life of the country. It will require the establishment of an appropriate institutional and legal framework and an adequate system for monitoring and evaluation of impact and outcomes of the objectives set out in the policy.

In addition, the actual implementation of the policy will require the mobilisation of financial, human and material resources and, to become more effective, it will be carried out according to the participatory and decentralised approach.

6.1 Legal framework

Existing laws protect some aspects of environment. However, most of the laws are sectoral, old and inappropriate. They are therefore not capable of ensuring the protection of environment in today's context. This state of affairs has a negative influence on the management of natural resources and environment.

To remedy this situation and ensure the successful implementation of the environment policy, it will be necessary to adopt an environmental law for sustainable development through sustainable utilization of environmental resources which meets the needs of present and future generations.

This law will have to be compatible with the country's political, socio-economic and cultural framework so as to ensure improved living conditions of the population. It will also have to provide a framework for the formulation, review and updating of sectoral laws for a better protection of the environment both at the central and local level. Finally, it will have to contribute to capacity building and to the strengthening of the missions of existing institutions.

Nonetheless, the law will have to include certain innovations, particularly the creation of a Rwanda Environment Management Authority and Provincial and District or Town Committees responsible for the management of environment in accordance with the new responsibilities of District and/or Towns under the policy of decentralisation and good governance introduced in the country since 2000.

6.2 Institutional framework

Being of a cross-cutting nature, environmental concerns require a multisectoral integrated management approach based on an institutional framework capable of enhancing the active and wide involvement of each and everyone.

Although there exists an institutional framework for the protection and management of environment, the implementation of the policy will require the establishment of an executive organ to support the Ministry responsible for environment as the conception and coordination body.

Therefore, the implementation of the policy will be entrusted to the Rwanda Environment Management Authority. This institution will be responsible for the following duties:

- (a) to coordinate various activities undertaken by environmental protection institutions for the protection of environment, and promote the integration of environmental issues in the developmental policies, projects and programmes with the aim of ensuring appropriate management and rational use of environmental resources on the basis of sustainable production for the improved well-being of the people of Rwanda;
- (b) to coordinate the implementation of Government policies and decisions taken by the Board of Governors, and ensure the integration of environmental issues in national planning, and in concerned departments and institutions within the Government;
- (c) to advise the Government on legislations and other measures relating to environmental management or to the implementation of relevant international conventions, treaties and agreements in the field of environment as and when necessary;
- (d) to make proposals to the Government in the field of environmental policies and strategies;

6.3 Role of Civil Society and private sector in the implementation of the environment policy

Non Governmental Organisations play a vital role in the mobilisation and awareness creation among the population on environmental issues. As such, they supplement the efforts of the Government and help to ensure that the concerns of the disadvantaged strata of society are taken into account in the national development process.

The private sector too is required to take a more active part in the protection of environment by ensuring that the environmental dimension are taken into consideration in all its activities, particularly in business, industrial and crafts activities.

The Government should give them a leading role in the implementation of the national environment policy with the ultimate aim of reaching local communities and grassroots organisations which are in regular contact with the population in all the corners of the country. A privileged place should be given to dialogue, discussion and exchange of views; training and capacity building.

6.4 Regional and International Cooperation

Environmental issues are seamless: they are very complex and involve the whole world. The context for their resolution goes beyond a single country, a single continent and extends on the whole planet. It is in this context that Rwanda join forces with neighbouring and distant countries so as to control cross-border movement of waste; manage better water resources and protected areas, and other environmental issues of a regional and/or international dimension, particularly those

relating to climatic changes, ozone layer and desertification control, biotechnology and others.

Rwanda has already ratified several conventions, protocols and agreements relating to environment and started their implementation. However, a number of these instruments have not yet been ratified and their implementation has not yet started. The environmental policy offers an unequalled opportunity for the actual implementation of the legal instruments to which Rwanda has acceded and those to which it will accede in future.

During the implementation of the policy, Rwanda will need a multiform and varied assistance from international and regional cooperation institutions; UN agencies and development partners.

The Government has already included environmental management in its multilateral and bilateral cooperation priorities and will take the necessary measures for the mobilisation and ensuring the efficient management of the support from its partners. Environmental management will also receive special attention in the allocation of domestic resources earmarked for development.

The Government will take measures to ensure a judicious allocation of budgetary resources with a view to enhancing inclusion of environmental issues in the different sectors of activity. The State, the local authorities and private economic operators are called upon to contribute to the cost of environmental management deriving from their responsibilities in this field.

6.5 Monitoring and evaluation

With a view to ascertaining and evaluating the impact of actions carried out in the implementation of the policy, a gradual monitoring and evaluation will be done. Policy statements and strategic actions will be adjusted as and when necessary to changes dictated by various circumstances that will occur in the future. Moreover, it is important to evaluate the effectiveness of the proposed strategies and the progress achieved in their implementation as resources become available and programmes and/or projects for the protection of environment are implemented. In this context, an internal monitoring and evaluation system is fundamental for the smooth and effective functioning of the Environment Management Authority.

In this connection, it will be necessary to develop systems for monitoring and evaluating the performance of the Authority and ensure that all the programmes and activities of the Authority have information systems with adequate and up to date data. It will also be necessary to establish progress benchmarks for all the programmes and activities and define properly the annual objectives and plans. Again, it will be necessary to build the capacities of Districts or Town and local authorities in the field of monitoring and evaluation.

The production and publication of periodic reports on the state of environment at the national and decentralised level will facilitate the evaluation of the progress made in the protection and management of environment and the adoption of the necessary measures as and when necessary.

6.6. Decentralization and environmental management

The Government of the Republic of Rwanda has opted for the policy of decentralization and good governance as a way of enhancing participation, transparency and accountability in compliance with efficiency and equity principles. The policy of decentralization and good governance in our country aims at developing the required capacities for the kind of development which gives priority to the poor, promotes women's emancipation, protect and regenerates environment and creates the necessary opportunities for employment and other means of subsistence.

The policy of decentralization and good governance introduced in Rwanda gives full authority to decentralized organs, namely Districts and/or Towns, in the fields of economy, policy and administration. Act No. 04/2001 of 13/01/2001 on the organisation and operations of Districts and Towns defines their responsibilities.

Districts and Towns are responsible for agriculture, livestock and forests. They are also in charge of land-use management, town planning, street cleaning, water supply, drainage, waste collection, treatment and disposal, maintenance of green gardens, parks and recreational areas, as well as the protection and management of environment.

District or Towns committees responsible for the management of environment are provided for by the environmental law and are in charge of the implementation of policies and programmes for the protection of environment at the local level.

The central Government will continue to be responsible for policy formulation and environmental planning, by passing laws and necessary regulations; monitoring and evaluation, organizing awareness, training and environment campaigns, and providing supporting advice to the needy decentralized institutions.

With regard to Local Governments, they will be responsible for policy implementation, application of laws and regulations relating to environment, and see to the protection of environment under their authority on a daily basis.