



Burundi

Macro Policies on Deforestation

July 2009

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First published in 2008 by the Nile Transboundary Environmental Action Project (NTEAP)

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Acknowledgements

The Nile Transboundary Environmental Education Action Project (NTEAP) wishes to acknowledge the many people who contributed to the success of this publication. The production of this report would not have been achieved without the efforts and support of the NTEAP staff and other participants from the Nile Basin countries who participated in a number of workshops. Dr. Abel Atiti's role as a critical reader, at the editing stage, is highly appreciated.

Finally NTEAP is grateful to the Global Environmental Facility (GEF), United Nations Office for Project Services (UNOPS) and United Nations Development Programme (UNDP) for supporting this initiative.

Foreword

The Nile Basin Initiative (NBI) is a partnership between riparian countries of the Nile; namely Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, and Uganda. The NBI's shared vision is to "achieve sustainable socioeconomic development through the equitable utilization of, and benefit from the common Nile Basin water resources". To translate this shared vision into action, there are two complimentary programmes: the Shared Vision Program (SVP) which creates a basin wide enabling environment for sustainable development; and the Subsidiary Action Programmes (SAPs) engaged in concrete activities for long term sustainable development, economic growth and regional integration of the Nile Basin countries.

The Nile Transboundary Environmental Action Project (NTEAP), one of the seven projects under the Nile Basin Initiative's (NBI) Shared Vision Programme, is mandated to provide a strategic environmental framework for the management of the trans-boundary waters and environmental challenges in the Nile River Basin.

As part of a broader plan of raising environmental awareness, NTEAP seeks to enhance the understanding of common and high priority policy issues that affect the environment of the Nile Basin. This will be done through policy studies of the patterns of economic development and priority transboundary environmental issues. The Nile Transboundary Environmental Analysis which was developed by the riparian countries in collaboration with the World Bank, UNDP and GEF identified priority environmental issues and threats in the Nile Basin. Better understanding of how these environmental threats are influenced by macro and sectoral policies and identifying the root causes is essential to explore possibilities of jointly addressing the threats.

In August 2006 the NTEAP held a planning workshop in Tanzania on impact of macro-sectoral policies on the Nile Basin environment. The workshop discussed the concept note on macro policies prepared by NTEAP, reviewed country papers and decided on the kind of studies that could be carried out in line with macro and sectoral policies. Topics were selected on the basis of their relevance to the Nile Basin, significance of trans-boundary aspect and where policy intervention/policy reforms will be required. Four research themes/topics emerged. These focused on the macro/sectoral policies: on soil erosion; non point pollution/pesticide pollution; exploration and development of oil projects; and deforestation in the Nile Basin.

This report aims to open a debate that will enhance understanding of the relationship between deforestation and the environment in the Burundi part of the basin. Thus it provides a forum to discuss a strategic environmental framework for the management of the Nile Basin and the impending environmental challenges and threats existing in the Basin. Further it will contribute to the achievement of sustainable and equitable socio-economic and development of communities in the basin. Specifically, this report provides a synthesis of the impact of macro-sectoral policies on deforestation in Burundi. It also suggests the necessary interventions and reforms required to influence policy change.

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Deforestation is the major environmental problem which affects the Nile Basin in Burundi. It is exacerbated by the macro and sectoral policies of the Nile Basin Environment. The impact of the deforestation in Burundi affects other riparian countries.

The main causes of deforestation in Burundi are human activities such as agricultural practices, overexploitation of biological resources, overgrazing, wild fires, human and livestock migration due to socio-political conflicts. Some of the consequences of deforestation are:

- Low soil fertility due to erosion,
- Deterioration quality of water,
- Climate change,
- Degeneration of water catchments areas,
- Diminishing wet zones,
- Decline in flora and fauna resources.

These consequences are progressively felt in Burundi and spill over in cross-border zones (Rwanda and Tanzania).

Severity and extension of environmental deforestation in Burundi

According to the World Bank estimates of 1990-2000 periods, there was an annual decline of forest cover of 9 %. More than 30,000 ha have been destroyed and forest cover declined from 8 % in 1992 to 6 % in 2000. Savannah grassland, which covered about 150,000 ha in the past, has been reduced to about 90,800 ha with 56,800 ha of protected areas.

Soil loss through water erosion is about 15 to 18 tonnes / ha in the central part of the country.

The cross-border impact of soil erosion is evidenced by deterioration of quality of water by sediments from effluents of Akanyaru and Akagera rivers. Soil erosion results into reduction in soil fertility in the Nile Basin zones of Burundi, decrease in soil's humus component from 4 % to 0.5

%). Deforestation is also a main contributor to climate change which is manifested through torrential rains and long dry season with an impact on water sources. Some lakes in the north such as Gacimirinda disappeared. People in highly deforested areas are faced with hunger and migrate to neighbouring countries such as Rwanda and Tanzania.

Macro-policies and sectoral policies on deforestation

Strategic Framework for Growth and Poverty Alleviation this clarifies areas for intervention based on major forest threats in Burundi as follows;

- Reforestation on deforested lands due to conflicts since 1993,
- Training and equipment for forester police,
- Development of plans for natural resource management,
- Strengthening research institutions in charge of natural resources,
- Involvement of local communities in forest management.

National Strategy for Environment and Environmental Action Plan (1998)

This strategy is perceived as a response to the antagonism between agricultural production and environment protection. The intensive agriculture practiced in the country leads to deforestation because of continuous fragmentation of available land.

National Strategy for Energy

Wood remains the source of energy in rural and urban areas. The lack of clear policy for alternative sources of energy is the major cause of excessive forest exploitation.

National Agricultural Strategy

The strategy lacks a clear policy for an intensive agriculture promotion for a

country characterized by increasing population growth and soil erosion. There is also a continuous need for agricultural land leading to a continuous encroachment into forest areas.

National Strategy and Action Plan for Biological Diversity

The strategy recognizes the importance of a coordinated and dialogue framework. However, mechanisms for coordinating actions of multi-sectoral and multi-disciplinary partners are lacking. Therefore, participatory approaches for management need to be specified. This explains why there is a decline in flora and fauna in some ecosystems.

Recommendations

- To develop a National Vision for long term development with specific priorities in terms of actions for environment protection according to the Millennium Development Goals.
- To strengthen inter-ministerial coordination by creating a frameworks for exchange between intervening parties and monitoring-evaluation for adjustment in case of failure of a given strategy.
- To develop a National Strategy showing major areas of intervention for sustainable land management based on requirements for a sustainable, fair and efficient land management.
- To develop a National Forest Policy based on fair sharing of profits from forest resources.
- To ensure good governance by strict adherence to the existing laws in forest industry.
- To strengthen institutions involved in management and protection of environment.

The south-most source of the Nile is in the Southern part of Burundi. Water runoffs from Central and Northern regions flow into the Akagera River which subsequently flows into Lake Victoria. Burundi covers an area of 13,518 sq km of the Nile Basin. This is about 48.6 % of the total area of the country. This area represents the south most part of the Akagera Sub-basin in the southern part of Lake Victoria Basin.

The Burundi part of Nile Basin is characterized by a tropical climate, with a dry season from June to September alternating with a rainy season from October to May. The rainfall varies from 1,900 mm/year on the Congo-Nile crest to 800mm/year in Bugesera Depression. The rainfall distribution is irregular especially in Bugesera. This leads to serious disturbances of agricultural seasons. The mean temperatures vary from 15°C to 25°C.

The Kibira Forest is the most important natural forest cover of Burundi. It is a humid tropical mountain forest rich in endemic flora and fauna species. In addition to its hydrological importance, it is of high economic, scientific and tourist potential. The other natural formations are mainly constituted of natural forest reserves covering 14,000ha. They include the Vyanda Reserve, Bururi Reserve, the Monge Reserve, Rumonge Reserve and Kirwena Reserve. These forest reserves are under threat from increasing demand of firewood and timber for the country. For example, in 1990, the national demand for wood was estimated at 6,000,000 cubic metres of fire wood and service wood and 179,900 cubic metres of timber while the supply was 1,000,000 cubic metres of fire wood and service wood and 260,000 cubic metres of timber. The current demand is estimated to be 7,762,000 cubic metres of fire wood and service wood and 233,000 cubic meters of timber. By 2012, these demands will rise to 10,750,000 cubic metres for fire and service wood and 322,000 cubic metres for timber.

Thus the most serious environmental problem in Burundi is deforestation which leads to soil erosion, loss of soil fertility and inadequate water supply. Consequently, these lead to decreased agricultural production which is the mainstay of the national economy, recurring hunger situations and shortage of wood resources for different uses by rural and urban households.

CAUSES OF DEFORESTATION

Many of the macro policies in place in Burundi are well elaborated following the socio-economic context of the country after the war. These policies are based on restoration of forests that were destroyed during the Burundian crisis and take into account the available capacities in the country. However, some of the policies need to be harmonized to take into account of the Millennium Development Goals (MDG).

Causes of deforestation in Burundi can be broadly classified as; causes of political origin; causes of juridical origin and causes of institutional origin.

Causes of political origin

Bad governance

The unlawful exploitation of forests is partially due to lack of respect of laws. Some legislation contains provisions with measures for environment protection. Local administrative authorities regard state forests as sources of direct and easy income leading to abusive logging. Tree cutting is carried out in disregard of the law banning unauthorised forest exploitation. Cases of abusive logging for income, bush burning for extending grazing areas, inadequate mine and quarries exploitation and poor monitoring of forests by local administration has resulted into continued depletion of environment in general and the forest cover in particular.

Article 69 of the Constitution of the Republic of Burundi clarifies the responsibility of each citizen in the use of the public good. The Article clarifies that each Burundian must defend the nation, protect and respect resources such as land and forests. The Constitution is supported by other laws including the Forest and land codes. Even though such laws that require individual to protect and conserve the environment do exist, the country continues to be faced with many environmental threats.

Article 77 of the Forest code focuses on protection of plant component of the biodiversity through creation of natural reserves, re-introduction of plant species and the development of botanic gardens and arboreta. Article 88 states that preservation of biological diversity, recovery of degraded ecosystems and regeneration of plant species under

threat or about to disappear constitute an obligation for the State, the local communities, private personalities, physical or moral persons. However, the main provisions of this code are not applied. Several articles of the code prohibit actions whose impacts are unfavourable to environmental management. For example, article 77 bans the clearing of state forests and forested areas.

The Land Code requires all stakeholders to be involved in the protection of land. Following Article 171, protection of soils against erosion is a national obligation and mitigation measures are of public importance. The failure to follow the Land Code is among the causes of land exploitation and degradation. Article 105 of the Mining Code requires one to prove the existence of mineral reserves and to make topographic designs before mining can be authorised. However, this is not respected and mining is often carried out in forest reserves in an uncontrolled manner. Failure to abide by this law is of the root cause of uncontrolled mineral and quarry exploitation. This affects plant cover in general and forest reserves in particular.

Lack of National Vision for long term development

The existing macro and sectoral policies are based on short and medium term plans. The main strategies for development and protection of environment need to be based on a long term vision for sustainable development. Some of the short and medium term plans include the National Environment Strategy (NES) and the National Agricultural Strategy. The Strategic Framework for Poverty Control (SFPC) is a fundamental policy for poverty alleviation and for nature protection projected up to 2015. This period is relatively short to plan for the protection and conservation of environment.

The National Vision for development must form the basis for elaborate national policies oriented to the creation of other income sources away from agriculture. As mentioned earlier agriculture leads to deforestation and excessive land atomization. Moreover, a National Development Vision must guide the implementation of programmes for mineral exploitation, roads and town construction and huge infrastructural development.

Lack of National Forest Policy

Major strategic directions in the forest sector are still based on the five-year plan of the Ministry of Forestry. Although the document contains essential elements of a forest policy, it is very general in terms of standards and measures to manage forests. It is important for the Ministry of Forestry to have a policy document clarifying basic principles and objectives to guide all stakeholders involved in the sector. The principles and objectives must ensure the sustainable utilisation of forest resources.

Besides degradation, the forest sector is facing poor management of the wood sector. The interdependence of different components of the forest sector and their complexity require a global and integrated approach to forest management. A lack of National Forest Policy has led to poor management of the wood sector. There is less interest of private operators in the sector as it does not generate sufficient incomes.

Lack of a policy for alternative sources of energy

Lack of policy on alternative sources of energy has contributed to overexploitation of forested areas. Wood remains the main source of energy in rural and urban areas. High population growth, excessive and often abusive logging in forests has increased demands for fuel wood. A policy on alternative sources of energy needs to be put in place with a view to reducing human pressure on fuel wood. There is a need to encourage the production of energy sources based on domestic wastes, the use of peat, solar or electric energy in order to reduce human pressure on forests reserves.

Inadequate use of arable land is also a root cause of land degradation. Extensive agriculture has led to over cultivation of land causing excessive erosion on the watersheds of the Burundian part of the Nile Basin. Exploitation of marshes is carried out without consideration of the existing marsh zoning. This has contributed to the drying up of marshes. The dried up lakes in the North of the country (Gacimirindi and Twinyoni) are cases in point.

Socio political conflicts

Socio-political conflicts that Burundi has faced since 1993 have negatively affected the environment in general and the

forest cover in particular. For example, internally displaced people have settled near forest reserves and exploited forests indiscriminately. The settling of refugees need to be based on a rational plan for managing environmental resources. Settlement of internally displaced persons without carrying out an environmental impact assessment is a root cause of immense forest destruction in Burundi. Donor funded projects that sought to restore forests before the socio political conflicts broke out have been interrupted due to loss of donor confidence in the country.

The existing plans and programmes of *Ministry of Land Management, Environment and Public Works (MLMEPW)* have a clear orientation to restore forests and to reduce erosion. However, most of actions planned since 1993 have not been implemented due to lack of funding. For example, the low budget of 1.5 % of national budget allocated to the environment sector in 2008 cannot enable the Ministry to operate even if essential activities are planned in its sectoral policies.

The formulation of a National Environmental Strategy is a response to the dysfunction between the agricultural sector and environment protection. The Strategy proposes measures to address linkages between development and environment concerns in the country. It gives directions for environment management. However, activities planned in the strategy have not been carried out due to lack of funds. Furthermore, the objectives of the National Action Programme to fight against land degradation that was drawn up in December 2003 within the framework of the United Nations Convention to Combat Desertification (UNCCD) have not fulfilled. These objectives are to:

- Ensure sustainable land use through the drawing up of a territorial zoning plan.
- Promote and implement techniques of management of watersheds.
- Alleviate effects of climatic disturbances.
- Contribute to poverty reduction.
- Contribute to good governance and strengthen institutions.
- Promote environmental awareness, education and information actions for the population.

A priority action programme for

implementing the Strategic Framework for Poverty Alleviation gives clear directions on future environment management. The programme provides government priorities for the rural sector in the framework of agriculture promotion and ecosystem conservation. Creation of employment and income opportunities seems to be a solution to reduce population pressure on forests resources. The National Self-evaluation of Capacities Project (NSCP) for the management of world environment was put in place in 2005. NSCP seeks to implement the Convention on Biological Diversity (CBD), the United Nations Convention on Climate Change (UNCC) and Framework Convention Against Desertification (FCAD). The Project aims to put in place strategies and plans of action for building national capacity to manage the environment. However, planned activities within the above mentioned programmes have not been carried out for due lack of funds.

Burundi has put in place a policy of Watershed Management to protect against erosion and to restore forest cover. A number of projects are being implemented through donor funding to realise this policy. The projects include the:

- Project of Watershed Management (PWM) of the Ministry of Environment, Land Management and Public Works of 2006. This project is funded by the Global Environmental Facility (GEF).
- Post-Conflict Rehabilitation and Transition Project (PC RTP) launched in 2007 and financed by International Fund for Agricultural Development (IFAD).
- Project of Rehabilitation and Development of Rural Areas (PRDRA) launched in 2001 and funded by IFAD.

These projects focus on the training of local communities on rural forestry and agroforestry in order to bring social change in the context of forest resource management, environment protection, erosion control and crop diversification. In conjunction with the FAO, the UNDP has financed a project on protection of watersheds and preservation of marshes in the central and northern parts of the country. The project has developed actions and strategies for community management of forests.

To address environmental issues that arise from socio political conflicts, Burundi has ratified a number of

International Conventions. They include the Convention on Biological Diversity (CBD); the United Nations Convention to Combat Desertification (UNCCD) and the United Nations Convention on Climate Change (UNCCC). Nevertheless, plans and programmes identified within these Conventions on addressing socio-political conflicts remain unfunded and hence, not well implemented.

The Convention on Biological Diversity constitutes a world success for the conservation of biological diversity, sustainable use of its components and the equitable share of benefits from exploitation of genetic resources. Article 7 of the Convention clarifies obligations and duties of each party in terms of identification and monitoring of threats on biodiversity, its conservation and sustainable use. UNCCC seeks to stabilise concentration of greenhouse gases in the atmosphere to a level preventing any dangerous entropic disturbance of the climatic system. On the national level, the implementation was notably reflected in implementation of the national communication on climatic changes that responds to article 7 of the Convention. Following the ratification of the United Nations Convention to Combat Desertification, Burundi has developed the National Programme of Action Against Land Degradation (NAALD). Realisation of objectives and activities planned in the NAALD can restore forests lost following mismanagement of environment.

Causes of juridical origin

Incomplete and often flawed laws

Legislation related to environmental management contains many shortcomings and inconsistencies and thus difficult to implement. There is also lack of strict adherence to internal legislation such as the Environment, Forest and Land Codes. There is need to harmonise legislation within these codes.

Lack of implementation texts and tools for existing laws

Some laws lack implementation texts to be operational. For example, the Forest Code lacks regulation on transfer and concession of State land. This causes transfer related problems of State's land properties to third parties as private land properties. This can be attributed to the allocation of land containing quarries to private persons by administration officials for revenue generation. However

this has had the consequences of uncontrolled exploitation of land and forests found on it.

Causes of institutional origin

Burundi has low institutional capacities in terms of human, material and financial means to address the issue of deforestation. There is also poor inter-sectoral coordination that leads to isolated and fragmented environmental management interventions by relevant ministries. Lack of an inter-ministerial coordination, monitoring and evaluation synergy is the root cause of the low implementation of plans and programmes on restoration, protection and conservation of the environment. Poor coordination and inter-ministerial monitoring-evaluation

The management of natural resources depends on the involvement of many stakeholders and Ministries. The lack of a framework of coordination of focal points with clear responsibilities undermines the implementation of plans and programmes oriented to environmental management. The coordination of the National Water Commission (NWC) confirms this argument.

Low civil society and stakeholder participation

The civil society and local communities are not fully involved in the management and protection of environment. The absence of a policy to involve all stakeholders in the management of natural resources through a participatory approach is one of the root causes poor environmental management. The Conventional on Biological Diversity underscores the need for the equitable sharing of natural resources as a strategy of ensuring adequate environmental management. The population living near gazetted areas need to use natural resources of these areas to acquire raw material for craft-related activities and medical plants.

The impacts of deforestation and the depletion of animals and plants have an influence on the environmental behaviour of the Nile Basin zone. The local communities have the right to access right natural resources like forests in order to improve their livelihoods. However, they also have a responsibility to participate to the sustainable management of the resources. Forests

management need to be decentralized in line with the principle of responsible sharing of benefits among local populations, the private sector and the State. Recently (March 2008), a study was carried out to evaluate the actions of various stakeholders in the Nile Basin. The aim of the study was to formulate operational recommendations for the Government and the civil society on sustainable management of natural resources.

Low level of training and information

The level of environmental awareness, training and information among the population on addressing environmental issues is still very low. Even though public and private media are integrated in land and water management by giving information on environmental education, there is lack of coordination and planning. Public and private radio-televisions have already taken significant moves to broadcast information on environmental issues in their weekly programmes. However, the lack of a strategy to intensify information on management of natural resources is the cause of the gradual absence of vibrant environmental education programmes. Good coordination of all stakeholders involved in the provision of environmental education and awareness programmes is required in order to increase the levels of environmental literacy in Burundi. This involves identifying key partners and ensuring the monitoring-evaluation of the impact of the training, information and environmental education.

Extent and severity of deforestation

Burundi has fourteen protected areas that represent variable ecosystems. Amongst these are mountain forests, dry forests and grassy savannas. These protected areas are threatened by unlawful exploitations of precious forest species, deforestation, fire to prepare land for grazing and cultivation. A number of factors hinder the conservation of the natural protected areas. They include:

- High levels of poverty around the areas
- Lack of appropriate conservation policies and legislation
- Inadequate financial resources for the management of protected areas
- Lack of awareness of environmental

importance of protected areas

The high Burundian population and animal movements due to socio-political conflict since 1993 exerted significant pressure on the bio-physical environment. This has led to increased deforestation and encroachment on protected parks. According to the World Bank, during the 1990 - 2000 period, an average of 9 % of forests was destroyed each year. This constitutes the highest rate of deforestation in the world. 93.7 % of Burundian households use wood as energy source (mainly for cooking). More than 79.4 % of urban population use charcoal as energy source. Over 30,000 ha of forests have been destroyed and the rate of forest cover decreased from 8 % in 1992 and to 6% in 2000.

Mountain forests with precious plant species have been subjected to over-exploitation for a long time now. The overexploitation of forest resources is characterized by an unlawful cut, sawing, and irrational harvesting, de-barking of trunks for medicinal use and charcoal burning etc. In several areas of the country, peasants get fire wood and charcoal from the most valuable species. Trunks are used to build cowshed and leaf stalks for roofs of houses. Due to increased fishing activities, big trees are cut to make pirogues. The baking of construction material (tiles, bricks) and the use of wood as energy in food transformation (drying of tea leaves) has led to exploitation of standing forests.

Land clearing for food or industrial crops has significantly modified vegetation cover in Burundi. According to National Strategy and Action Plan on Biological Diversity of 2000 (NSAPBD), the previous forests observed in the past years on crest from North to South are but represented as very distant shreds. They have been destroyed by farmers and pastoralists looking for rich soils and grazing areas respectively. Former savannas with trees occupying 150,000 ha 50 years ago have been reduced to 90,800 ha of which, 50,800 ha are protected under Ruvubu National park (SNPA-BD, 2000) Farming after land clearing and burning has led to progressive degradation of savannas in the East. In highlands and on the level of central plateaux, some valleys with *Cyperus* and *Cyperus pseudocladus* are replaced by traditional food and vegetable crops. The introduction of

crops like rice and tobacco coupled with fishing practices has aggravated the already precarious situation of marshes.

The extensive cattle rearing system in Burundi has caused overgrazing of natural grasslands. This has resulted into a reduction of ecosystems and degraded soils. This environmental issue is prevalent in the Eastern part of the country and on Congo-Nile crest where natural spaces and lawns are degraded. In central plateaux with vegetation adapted to degraded soil, *Eragrostis olivacea* is the most common plant species. Prevalence of this species has contributed a high level of soil acidity in the region.

Erosion and soil losses

The root causes of soil erosion are deforestation, population pressure, poor agricultural techniques and practices, effects of climate change (high temperatures and heavy rains) and the geological nature of soils. The magnitude of water run off also varies with the same factors conditioning solid transports but depends specially on rain intensity, soil type and water saturation.

Land resource in Burundi is over-exploited with the tendency to cultivate on steep slopes and small plots. The population pressure is the cause of the use of all lands for agriculture. An estimated population of 7.3 millions in 2004 with an average density of 250 inhabitants per sq km exerts a strong pressure on natural resources in general and in particular on arable areas as more than 93 % of Burundian population depend on agriculture and livestock. Based on the current population growth rate, it is projected that there will be 11 millions of inhabitants in 2020 with an average density of 392 inhabitants per sq km (BEP, 2007). Following the National Action Against Land Degradation Programme (NAALD) data (2003), land atomization due to high population density is responsible for insufficient agricultural plots (0.5 ha / household). Soil is exposed to erosion due to continuous cropping and lack of fallows. The practices for protecting soils against erosion constitute an investment in terms of time and energy that peasant families cannot manage alone.

Soil losses and the rate of water run off on farmed plots vary significantly. The losses depend on rain intensity, land cover, soil type, slope and its length, degree of soil

humidity, agricultural practices and management systems. The experimental results of IASB show that on a bare plot recently ploughed, soil losses can reach more than a hundred tons per hectare for one set of heavy rains. These losses are equivalent to 1 cm of superficial soil taken on the whole plot and if the phenomenon occurs several times in similar conditions, all arable layers disappear.

Extensive farming in densely populated Burundian zones of central plateaux (Muramvya-Gitega) has already led to excessive atomisation of land on which, agricultural exploitation for the rural area averages 0.3 ha per household. That phenomenon has already had its impact on water erosion varying from 15 to 18 tonnes of lost soil / ha / year. The excessive erosion has its transboundary impact given that the waters of Akagera and Akanyaru tributaries contain substances in suspension that are likely to degrade the water quality. This is proven by the reddish clay sediments deposited along Ruvyironza and Ruvubu rivers.

The effects of erosion and soil losses on the ecosystems of Nile Basin zone lead essentially to bare lands of the Burundian part of the Nile Basin. They also lead to an accumulation of sediments in Nile waters of other countries. The consequences of soil erosion include modification of biodiversity in the region. Climatic conditions are often linked to the vegetation cover; deforestation; negatively impacts on precipitation's distribution in Burundi and the sub region. This case is illustrated by extension of dry season with a rainy season characterized by torrential rains in 2006, 2007 and 2008. Equally, the displacement of sediments originating from erosion along Akagera and Akanyaru rivers will have an impact on the biodiversity of marshes in the sub-region. This is explained by a deposit of red clay alluvium in the sub-basins of Ruvubu and Akagera modifying progressively the wetlands and aquatic zones of regions crossed by these waters.

Decrease of soil fertility

There is rapid decrease of soil fertility in Burundi due to soil depletion that results from water erosion and intensive agricultural activities on small plots. Decrease of fertility is also accompanied

by an increase in soil acidity and the rate of free aluminium. For example, the amount of humus in soils in central Burundi has decreased from 4 % to 0.5 % with the rate of mobile aluminium decreasing from 2 % to 6 %. Erosion is accelerated by downstream ploughing activities that progressively remove the arable layer, lack of organic matter restoration due to progressive loss of soil fertility, removal of harvest residues and agricultural waste and insufficient organic manure. The decrease of soil fertility is the basis of reduction of crop productivity and frequent and recurring hunger situations in Burundi.

Deteriorating of water quality

The degradation of the water quality in rivers and lakes of Burundi is often caused by movements of suspended soil sediments in water run off. The material in suspension is responsible of high turbidity and excessive sedimentation in aquatic habitats. This turbidity is unfavourable to biological productivity of water. This explains the low potential in fish in rivers of the Nile Basin. The sedimentation is responsible for silting on wetlands and in lakes. A major part of this sediment load is washed into Akagera and Akanyaru ending up in Lake Victoria.

Climatic variability

As a result of severe deforestation in several places of the country, there is evidence that the climate has considerably changed. Unusual climatic conditions have been experienced over time. For example, the rainy season, has shortened from 9 months to between 5 and 6 months since 2005. Often the climatic disturbance is accompanied by other serious consequences such as floods and in some cases drought. Such climatic changes will not be limited to one country but will affect the entire region. Effects of climate change in the Nile basin include flooding, drought and famine, human displacements from country to country, loss of habitats and biological species and ecological imbalances.

Drying up of water sources and courses

As water used for farming is mainly from rain, any climate change causes a significant reduction in agricultural production. It also negatively impacts on biodiversity in general and on forest

resources in particular. Water as a resource has been a major tool in the strategies for socio-economic development of the country. Many sectors such as energy, health and agriculture depend on water. However, water quality lowers due to climate changes and deforestation. The drainage and drying up of marshes for agriculture purposes have increased land under cultivation to the detriment of natural ecosystems and forests. For example, Gacimirinda Lake in Kirundo Province, disappeared due to drainage and farming without an afforestation plan. Other water sources disappeared in the central and eastern parts of the country due to lack of a recovery plan for swampy lands exploited for agricultural purposes. The drying up of waterways in Burundi has disastrous consequences on the country's ecosystem as well as that of the Nile River Basin. The water of Akagera and Akanyaru rivers getting into the Nile Basin has diminished.

In addition to agricultural and livestock products, wild plant and animal species, the disappearance of species has been caused by lack of clear policy for creating alternative resources for use by the population. The list of species under threat of disappearance on the national level has been increasing with time (BEP 2007). Animal species have been affected by human population explosion increased farming activities. Currently, 101 species are under threat of disappearance. According to data published by PEP (2007), 45 species are endangered and 10 mammalian species are reported to have become distinct (BEP, 2007). The depletion of biodiversity is noticed at worrying proportions at the intra specific level.

Degradation of wetlands

The degradation of wetlands is a result of inadequate agricultural practices, mine exploitation, overexploitation of plant and animal resources. Important wetlands in the sub-basin of Akanyaru-Nyabarongo-Akagera are transboundary. They constitute water reservoirs and biological resources shared by Rwanda and Burundi. Their degradation by the lowering of the water level of those wetlands or the drying up could have as negative impact such as loss of plant and animal resources.

The swamp and lake settings of the Akanyaru-Nyabarongo-Akagera system

and that of Ruvubu constitute a reservoir for water storage playing an important role in the regulation of water flow in the medium and lower parts of Akagera. Water is retained during periods of floods and released during the dry season. Its destruction would thus result in fluctuations of Akagera water level with floods during the rainy season.

MACRO/SECTORAL POLICIES

Burundi has developed a number of environmentally related policies for the protection of natural resources and the environment in general. The majority of these are sectoral in nature and lack monitoring and enforcement. This section discusses some of the macro policies especially those which relate to forest protection. The section also looks at the effect of these macro policies on the protection of forest

Strategic Framework on Growth and Poverty Alleviation (2004)

The Strategic Framework for Poverty Control (SFPC) was formulated in 2004 within a framework of sustainable recovery of economy and national reconciliation. To improve environmental protection, SFPC clarifies areas of intervention based on environmental threats in a post-conflict country. These areas include:

- Equipping and training specialists on water issues
- Training and equipping the environment police
- Formulating plans on natural resource management
- Invigorating the NEC
- Reforesting all Watersheds
- Protecting natural resources under threats
- Exploring exploitation of community forests as a source of incomes
- Involving the private sector in natural resource management

In short, the SFPC is a complete policy for the country's development in general, and to protect and conserve environment in particular. However, the strategic framework lacks efficient mechanisms of lobbying and advocacy. As is the case with other policies, lack of implementation of the SFPC is attributed to poor funding. Donors seem reluctant to support a number of projects, including those which are environmental in nature. However, the World Bank

through the Global Environmental Facility (GEF) supports activities in the forestry sector.

Programme of Priority Actions for implementation of the Strategic

The Government of Burundi, in collaboration with its development partners has drawn up a programme of priority actions for implementation of the SFPC for the period 2007-2010. The programme gives clear orientations on environment management for this period, considering the population pressure and agricultural methods used in Burundi. It outlines the government priorities for the rural sector to promote agriculture and to conserve ecosystems. The creation of job opportunities is seen as a solution to reduce population pressure on resources. The restoration of destroyed natural resources and the protection of existing environment resources have also been identified as priorities in the SFPC.

Framework for Poverty Alleviation (2007)

While natural resources continue to be degraded, there is lack of human, technical and financial means for the priorities identified in the SFPC. Although the good content of the priority programme for poverty alleviation and environment protection are well articulated, the evaluation of Millennium Development Goals in Burundi shows a delay in implementation of objectives referring to the vision for 2015 set targets.

National Strategy and Action Plan on Environment

The National Strategy for Environment (NES) is perceived as a response to malfunctions of the agricultural sector and environment protection specifically to settle the conflict between development objectives and those of natural resources protection. The National Strategy for Environment in Burundi (SNEB) was set up in 1992 and updated in 1997. The Environmental Action Plan (EAP) was completed in 1998. The National Environment Strategy proposes measures to address the balance between development interests and environment concerns in Burundi. Based on the NES, the Ministry for Environment has developed a five-year Implementation Plan of 2006. The plan focuses on problems the Ministry for

Environment is facing in the area of environment protection.

The objectives of the plan should be implemented by the Central Administration services under the authority of the ministry and Public administration institutions. Services of the Central Administration comprise the General Management of Territorial Management, Rural Engineering and Protection of Land Heritage, the General Management of Forests and Environment with the support of Public Administration Institutions managed by the MLMEPW are NIENC and Burundi Geographic Institute (BGI). On the institutional level, all structures are in place to manage and safeguard the environment.

The five-year Plan of the MLMEPW as stated in the NES is supposed to highlight a clear policy to ensure strict adherence to the internal laws such as the Environment Code, the Land Code and the Forest Code. Burundi has laws and texts which could help to significantly reduce the main environmental problems like deforestation. The Forest Code bans tree cutting without authorization from technical services of MLMEPW. However, State forests are the target of illicit logging by local authority supposed to respect the law. This is a result of failure to implement the law which is supposed to be applied irrespective of its shortcomings

The absence of a plan and a strategy at the NES level to revise laws and texts with shortcomings contributes to poor management of natural resources. Also, the lack of tools for environment management constitutes a barrier to implement plans and programmes for the management of natural resources. The National Environment Strategy needs to outline ways of mobilising funds given that development policies during the crisis were evidently not applied. The existing plans and programmes for example at the MINATETP have a clear orientation to restore forests and reduce erosion. However, most of these have not been implemented since 1993 due to lack of financial means. The lack of a policy for mobilization funds is one of the major causes of failure to implement projects and programmes.

There is need for the harmonisation and stronger synergies in the planning and implementation of projects and programmes in the environment sector

in Burundi. The assessment report on the implementation of Agenda 21 in Burundi shows that inter-sectoral integrations are low. It also highlights lack of coherence and harmonization of interventions. The report further states that development policies have had a negative impact on the environment in particular for agro-sylvo- zoo-technical sectors, handcraft and industry, energy and mines. The socio-political context of crisis in the country hindered implementation of environmental action plans.

Sectoral policies and their impact on forest management in Burundi

The National Energy Strategy

Electricity in Burundi is mainly generated from hydroelectric power (more than 95%). A low proportion is generated from thermal. Electricity production from other sources such as wind, and photovoltaic is still marginal. Despite the dependence on hydroelectric power, the rate of electrification is very low in rural areas. The number of households with supply is 1900 of the 1,400,000 households, representing 0.1%.

In the framework of progressive disengagement of the State from the production and distribution of electricity, the Government decided to liberalise the generation and supply of electricity to allow the participation of the private sector. This approach is based on law n°1/014 on liberalisation and regulation of electricity sector, promulgated on August 14, 2000. It is assumed that when the private sector invests in the power generation, many citizens of Burundi will have access to hydropower electricity and reduce on the consumption of wood-energy is about 95% of the total available energy. This represents more than 6,400,000 cubic metres of wood energy used at the national level per year. In 2004, this consumption was about 5,900,000 cubic metres. The rural area use more than 76% of the total consumption at a rate of 2.93kg/person/day. The agro-industry, commercial and institutional sectors use 24% of the energy. Charcoal consumption is about 346,617 tonnes representing an average of 0.67kg/person/day. This is an excessive consumption since it requires more than 188,000 ha of forest with a rate of exploitation of 34m³/ha/year. This poses an environmental threat of deforestation if measures are not taken to reduce charcoal consumption.

resource to satisfy the population's fundamental needs;

- Multidisciplinary water management;
- Responsibility of neighbouring countries for the management and maintenance of common waterways.

Implementation of this policy faces many challenges that have to be overcome. Some of the challenges include:

- Low interest in management, protection and conservation of water resources;
- Persisting confusion between the roles of management, protection, conservation and exploitation of water resources;
- Insufficient human, technical and financial means;
- Insufficient consultation between various partners in water sector;
- Low mobilization of funds in the water sector;
- Low population's understanding of the strict implementation of the law organizing the public hydraulic domain;
- Insufficient specialised permanent frameworks in planning and management of water resources;
- The scattered habitat on an uneven relief, does not allow an easy and rational exploitation for agro-sylvo-zootechnical ends; and
- The phenomena of climate change that is reducing the water potential.

Institutional and legal frameworks

Institutional Framework

The MINATETP lacks human and financial means to implement set plans and programmes for the management of land; water; forest; and air. In order to strengthen its capacity, the MINATETP works with other line ministries. However, the intersectoral coordination is still weak.

Focal persons have been appointed in line ministries such as the ministries of Planning, Agriculture, and Communication, Mines and Energy, Public works and other government institutions to form the National Environment Commission (CNE). The CNE was established as a body for reflections, arbitration and assessment of environmental impacts. However, the commission seem to concentrate on information exchange and as an informal network for meetings. It is also

characterised by overlapping even creating rivalries in the process of sharing, roles and responsibilities. Thus most institutions have elected to operate in isolation.

Further, the National Environment Commission lack debates on the necessity to reconcile development and conservation. Instead it concentrates on protection. CNE is also faced with the challenge to differentiate roles from those of the MINATETP. Line ministries see activities of the CNE as extra job to their duties. Some members have no skills to analyse the integration of environmental impacts. In addition the CNE does not have its own budget but depends on MINATETP budget. The CNE constitutes an advisory technical structure instead of framework which could be used to orient policies.

The environment police in charge of overseeing protection of forests and gazetted areas are facing institutional-related constraints. The officials of protected areas do not have authority over the environment police.

Research in environment is a responsibility that is shared by the University of Burundi (Faculty of Sciences, Faculty of Agronomics), INECN and NGOs involved in environment. However, the research output is negligible. There is little or no investment in research that focuses on the environmental related topics.

This brief review of the institutional framework shows that there is little institutional capacity for the development and implementation of policies on environmental impacts. The MINATEP and MINAGRIE both lack qualified personal to support work in the environmental field. This is exacerbated by the fact that like the other line ministries, the two ministries also work in isolation.

Legal Framework

Burundi has enacted a number of laws for the protection of the environment in general and natural resources in particular. These laws are, in the main, adequate to protect the environment and natural resources. However, lack of implementation strategies and programmes affects the efficient application of laws. These laws include: the Republican Constitution; communal law; creation of National Parks and reserves; forest code; land code;

environment code; mines and oil codes; and plant protection code.

The Constitution of the Republic of Burundi

The Constitution of Burundi recognizes the importance of environment protection and promotion of natural resources. Given that the development of the rural area constitutes the basis for the promotion of agro-sylvo-zootechnical development, the support to the agricultural sector can highly contribute to improve protection and restoration of land cover in general and forest heritage in particular.

Article 56 stipulates that the State has an obligation to favour the country development, and that of the rural areas in particular. In addition, Article 69 stresses that public goods are sacred and inviolable. Each one must scrupulously respect and protect them. Each Burundian citizen has the duty to defend the nation's heritage.

Any act of vandalism, corruption, dilapidation or other act disturbing the public good is punished within conditions specified by law. Despite the clear and real content of the first law of the country on fundamental duties of citizens and individuals to protect and safeguard the environment, the country is exposed to a high risk of natural resource deterioration by illicit use.

Communal Law

Law n°1/016 of April 20, 2005 on organisation of communal administration. Communal Law clarifies in Article 31 that one of the attributions of the Communal Administrator is to take measures on environment preservation. Article 84 related to communal estate, properties belonging to communal public estate are not subjected to trade when they have not been regularly dedicated to public use.

The State can transfer to communes, in exchange for payment or for free, all or part of its land plots set within its boundaries. As the article reads, the commune can use properties having a private form for commercialisation. However, the law lacks precisions on modalities for the exploitation of resources of private heritage notably, natural resources (forests, water and quarries) based on attributions of the communal administrator referring to Article 31 of the communal law. Further,

In order to reduce the dependence on fuel wood, the Burundi Centre for Studies on Alternative Energies (BCSAE) was established in 1983. The Centre carries out activities of applied research and diffusion of alternative energies from solar, wind and biomass. A number of biogas projects were created at the time. Thus, before the 1993 crisis, a good number of installations were made all over the country.

More than 50KWC with photovoltaic installations, more than 320 biogas installations and some wind energy units for water pumping were created. Currently, more than 70% of biogas installations are out of use due to lack of maintenance and vandalism. More than 50% of solar energy installations have broken down or have been stolen. After 1993 crisis, the development of these technologies slowed down following the suspension of foreign funding and reluctance of the private sector to invest in this area.

National Agricultural Strategy (July 2008)

The National Agricultural Strategy provides major orientations for the promotion of a market-oriented modernised agriculture for the period 2008-2015.

The document highlights the main constraints of the Ministry of Agriculture and the agricultural sector. It provides the major activities to be undertaken in order to resolve the identified constraints and the cost implication. However, the strategy lacks a proposal for a clear policy to promote intensive agriculture for a country with high population growth and accelerated soil erosion. The strategy also lacks mechanisms to mobilise funds to implement short, medium and long term objectives.

National Strategy and Action Plan on Biological Diversity (May 2000)

Within the framework for the implementation of the Convention on Biological Diversity in Burundi, a national framework to develop a policy on conservation of biodiversity was created. Burundi formulated a National Strategy and Action Plan on Biological Diversity (NSAPBD) in May 2000. The Strategy addresses conservation and sustainable use of elements from the biological diversity and fair and equitable share of

benefits from their utilisation. The Action Plan on Biological Diversity requires the country to carry out a detailed study on the:

- Diversity of wild plants and animals
- Diversity of cultivated and domestic species
- Diversity of biological resources
- Access to results of biotechnology
- Assessment of the impact of bio-security
- Aspect of fair sharing of benefits from natural resource exploitation
- Socio-cultural aspects in natural resource management
- Analysis of the legislative, political and institutional framework related to the CBD objectives.

The Strategy identifies threats to biodiversity in Burundi as well as actions to counter these. Although the strategy highlights the importance of setting up a framework for the coordination and inter-sectoral dialogue, it does not include mechanisms for coordinating actions of different multi-sectoral and multidisciplinary partners.

As biological resources are used differently at different levels, a participatory approach to the management of these resources is desirable. However, the strategy in its current form does not provide for communal and integrated participatory approaches to natural resource management.

It lacks an important regulation related to access to common resources for the population living near gazetted areas. The National Committee in charge of biodiversity management has turned into a mere body of information exchange; instead of playing the role of monitoring and evaluation as well as finding solutions to current issues.

National Action Plan to fight against land degradation (December 2003)

The creation of a National Action Plan for protection against land degradation (PAN) took place in December 2003. This was with the view to implement the United Nations Convention against Desertification. The programme considers problems related to management of natural resources and ecological balance. It focuses on the following:

- Sustainable use of land by the drawing up a Territorial Zoning Plan;

- Promotion and implementation of management techniques of watershed;
- Mitigation of effects of climatic disturbances;
- Contribution to poverty alleviation;
- Contribution to good governance;
- Institutional promotion; and
- Promotion of sensitisation, education and information actions for the population.

For each focal area, actions to be carried out and partners have been identified. The programme provides modalities for monitoring and evaluation by a multidisciplinary steering committee. The lack of policy for fund mobilization might have contributed to the failure to achieve objectives that are well detailed in the PAN. The lack of technical, human and financial means did not allow carrying out planned actions.

National Policy of Water Resource Management and Plan of Action (August 2001)

The national policy of Water Resource Management was developed to correct existing shortcomings in relation to the tools for water resource management in Burundi.

The policy clarifies general principles for water management policy. It proposes major orientations towards the development and management of water resource in agricultural production, supply of drinking water, industrial promotion, energy and environmental protection.

The national policy for water resource management also considers the reality that Burundi shares water resources with other neighbouring countries.

While water is a resource intervening in socio-economic development of the country, the policy of water resource management must be grounded on a number of basic principles taking into account social, economic and cultural aspects of Burundi. The following are the basic principles upon which the Burundian policy is built:

- Political commitment to sustainable development of water resources;
- Cooperation for respect of national sovereignty in the area of water management;
- Safekeeping of water and environment quality;
- Obligation of the State to use the

inadequate management of natural resources is practised on the level of local territorial administration (commune) due to misinterpretation of the law and lack of its implementation texts.

Creation of National Parks and Natural Reserves

The decree-law n°1/6 of March 3, 1980 on creation of National Parks and Natural Reserves determines the juridical system for gazetted areas notably on the ban of their concession and transfer, special measures on flora and fauna conservation, prohibition to set settlements near national parks and natural reserves, visits within gazetted areas.

The text does not define categories of gazetted areas “national park”, “natural reserve”, or “integral natural reserve”.

The creation of parks and reserves did not adequately consider the needs of neighbouring communities.

The communities living near the gazetted areas need to exploit natural resources from those areas for survival. They are therefore obliged to use the resources irrespective of the government's compelling policies and decisions. In addition, these communities have a traditional knowledge that they have used to for sustainable use of natural resource management.

The Forest Code

Law n°1/02 of March, 1985 on the forest code determines a set of specific regulations governing the administration, planning, exploitation, and the monitoring of forests. It integrates several statements for conservation and sustainable use of forest resources and other statements on integrity of forests officials.

The Forest Code focuses on the protection of plant biodiversity. For example, Article 77 promotes the establishment of natural reserves called integral reserves within or outside the parks.

These are areas that follow strict measures to ensure protection of endangered plant species in the country; the reconstitution of plant species, the conservation of botanic gardens and arboretum constituting reserves for plant species on the brink of disappearance, rare or outstanding species.

Article 88 states that preservation of

biological diversity, recovery of degraded ecosystems and regeneration of plant species under threat or about to disappear constitute an obligation for the State, the local communities, and individuals.

However, the code has shortcomings such as failure to define the status of public and private forestry, failure to clarify the administration powers, and conditions or procedures to prevent abuse of resources, and by prohibiting their use instead of regulating them (articles 45 and 56).

The Land Code

Law n°1/008 of September 1st, 1986 on creation of the Land Code. The Land Code comprises provisions calling on all stakeholders involved in protection of land to guard against any land degradation such as that resulting from soil erosion.

In Article 171, protection of soils against erosion is a national obligation and measures for this objective can be declared of public importance. Referring to this code, if soil protection is a national obligation, forest cover is also an obligation that must prevail at all levels. Analysis of the code shows that there is no provision for the protection of the land resources against degradation. Moreover, the Land Code limits application of the Forest Code: discordance in terms of competences for decisions on transfer and concession of forested land.

Environment Code

The fundamental principles of environmental legislation are registered under the Environment Code but are not known and are therefore not applied. Moreover, there is a tendency to consider the protectionism vision of the Environment Code while it was conceived to reconcile environmental quality and socio-economic development; for example, the Code promotes agricultural intensification and at the same time encourages environment protection.

Mines and Oil Code

The Mine and Oil Code governs the exploitation of mining and quarrying activities.

The person(s) that require mining rights are obliged to prove the existence of the volume of mine reserves to be exploited.

However, this is not respected and quarry's exploitation is often carried out in forest reserves in breach of the law. Failure to abide by this law is the major cause of illegal mine and quarry exploitation, affecting obligatorily plant cover in general and forest reserves in particular.

Plant Protection

Decree-law n°1/033 of June 30, 1993 bearing on plant protection. The phytosanitary legislation exists but its major orientations are not applied. With the ministerial Ordinance n° 710/550/309 of May 21, 1999, an officers' service card for phytosanitary inspectors in charge of phytosanitary invigilation was created but unfortunately it is not working. Implementation texts could clarify police's regulation for phytosanitary inspectors. Moreover, this legislation does not match with procedures, measures and phytosanitary standards prepared for States which are members of the East African Community.

Shortcoming and Inadequacies of the laws

The above laws have some shortcomings and inadequacies either in terms of updating or implementation. These include the following:

- Juridical shortcomings for example in the area of biotechnologies, use of income from exploitation of biological resources, definition of environmental standards, specific regulation for marshes;
- Sectoral codes (forest, mine, land, law on public the hydraulic domain, law on gazetted areas) are not harmonized with the environment code;
- There is no implementation text for codes, this renders legal obligations unoperational;
- The codes are not known by the various ministerial services, communes, the environment police and the public. As they are not translated into Kirundi, they cannot be easily popularised;
- Contradictions exist between the codes (for example between the forest code and the land code), this results in difficulties of interpretation;
- Being scattered, these texts are not easy to consult and it is important to

compile them in one set for their
easy consultation;

- No evaluation has been done on
implantation and effects of

regulatory texts.

Recommendations

This section provides some suggestions for remedial measures that should be taken to reduce deforestation. The section is divided into three major parts. These are political, institutional and legal frameworks respectively.

Political Framework

Good Governance

During the 1993 crisis in Burundi, the government faced a big challenge to win donor confidence as most donors fled the country or simply withheld financial support to the programmes. The government could not guarantee the security of foreigners. The signing of a cease fire between the government and rebel leaders demonstrated that there was hope for peace. Good governance is slowly being assured in the country. But this needs to be supported and strengthened by the citizens.

Public security

To operationalise development plans and programmes, it is necessary to boost security for persons, properties and services. This is important especially in the aftermath of the war. Reference policies exist and they notably include the CSLP, the National Environment Strategy and the National Agriculture Strategy.

National vision for development

Burundi faces challenges whose solutions require long term projections such as the management of agricultural areas; expansion of urbanisation; and sustainable exploitation of mines and quarries, among others. The integration of sustainable development principles in national policies could be achieved by taking into account the socio-political environment at national and international level.

The integration of millennium development goals into the National Development Vision is important for the orientation of development plans and programmes. Given that most policies have been developed without a National Vision for Development, policy formulation should embrace the vision.

Inter-ministerial coordination

Environment constitutes a common heritage whose safekeeping for a country is the duty of the State, communities, public or private organisations and

individual citizens. For the success of this mission, a structure of a horizontal coordination of stakeholders is key. The sectoral policy must therefore be revised to reflect mechanisms for inter-ministerial coordination in order to ensure synergy in the environment management. The absence of mechanisms for inter-ministerial coordination undermines the functioning and the implementation of objectives of various ministries. Coordination and collaboration principles should be incorporated in sectoral policies of all line ministries.

Agriculture reform policy

The lack of clear policy on agricultural reform in Burundi is one of the causes of environmental degradation. Thus agricultural Reform Policy must be incorporated into the five year plans of the ministries involved in the management of environment such as the MINATETP and MINAGRIE. The sectoral policies of MINATETP and MINAGRIE must be revised to incorporate mechanisms for adequate agricultural reform to reduce human pressure on natural resources.

Financial mobilisation

The sectoral policies of key ministries responsible for environment management must include strategies for financial mobilisation to carry out planned activities. The setting up of a policy for fund mobilization would allow the timely implementation of plans and programmes. For every plan and programme there is a need to identify partners; assign responsibilities to intervening parties and to establish results on each level; and advocate adjustments in case of failure or shortcomings. Monitoring and evaluation framework should be an integral part of the implementation process.

National Strategy on Sustainable Land Management

The National Strategy on Sustainable Land Management need to clarify the major orientations arising from the prospective vision of society and international commitments taken in the framework of sub-regional integration. Once clarified, these orientations can serve as references for the development of future tools for the planning of spaces

and future sectoral interventions in the territory.

National Forest Policy

● Considering the population's needs for fuel wood, food and habitat, the government must set up a coherent policy on the recovery of the destroyed forest cover and the development of destroyed forest heritage. The policy should promote the participation of the State, public administration, schools, NGOs and the population at large. Other related strategies that might strengthen the National Forest Policy may include the following:

- Develop agro-forestry around the natural forest to limit pressures on floristic species;
- Conceive and implement income generating projects such as small-scale stockbreeding to limit pressure on fauna species;
- Involve communities and the local administration in the management of natural resources.
- Promote use of indigenous knowledge systems on the richness and management of parks and reserves;
- Encourage the bringing of flora species of scientific/ or economic interest to family exploitations;
- Plan extension of forested areas in the country;
- Promote forest research and domestication of species;
- Set up incentives for private reforestation in provinces;
- Promote techniques allowing the economy of wood like carbonisation techniques;
- Stimulate emergence of professional operators; in the forestry sector.

Strengthening Institutional framework

Boosting the MINATETP

Strengthening intersectoral integration and coordination can be enabled through the National Commission for Environment. However, the state funding of less than 1% must be increased if the operations of the commission have to achieve its intentions. There is also need to create a structure within the MINATETP that would be responsible for monitoring and evaluation. Its activities would include: Environmental Impact Assessment (EIA), evaluation of effects of sectoral projects and macro-economic policy on environment. The current EIA

team in MINATETP must be reinforced by multidisciplinary team.

INECN and IGEBU

The human and infrastructure-related capacities of institutions in charge of INECN management and monitoring of environment are too low to produce any meaningful results. The IGEBU needs a new working orientation with technical and scientific tools responding to the current requirement and challenges resulting from climate change and natural calamities.

Wildlife Police

There must be a clear law for management of policemen and a large-scale training on environment management. The current set up where the forest police are attached to the Ministry of Home Affairs renders INECN (which is in charge of gazetted areas) useless. Further forest police need to be trained in modern natural resource law enforcement techniques.

Research and training in environment

There is need to enhance Research and Training in the environmental area at the University of Burundi and Burundi Agricultural Resource Institute. The development of an exchange programme between INECN and ISABU and other stakeholders in environmental research and training is also needed.

Involvement of local communities in environmental management

A major part of forest reserves belong to communal administration under the Ministry of Home Affairs and Public Security. There is need for a law or policy that encourages and promotes communal management of forest resources. Hence co-management framework that supports community participation must be put in place.

Civil Society's Participation

The civil society has a major role to play in management and protection of the environment. However, its impact in Burundi is still low. There is need for policies that support civil society as a watchdog on the environment.

Role of the media

Currently the media is integrated in water and soil management. The role of the media can be expanded in the environmental sector. Both public and private media can provide the checks and balances in the environment sector.

Environmental training, information and education

Burundi does not have a coherent system of environmental information and monitoring to guide environmental strategies. Basic statistical data related to land and forest resources is not available. The Centre for Environmental Information at the MINATETP needs to be strengthened and equipped with tools, human and financial resources if it has to accomplish its vision.

Legal Framework

The legal frameworks and legislation that are supposed to support the development of environmental related policies are weak and exist as discrete entities. Thus there is need to strengthen existing laws and develop new ones in areas where they do not exist.

Revision of existing legislative texts

Burundi has a number of legislations that need to be revised, harmonised with international conventions and treaties signed and ratified by the government.

The regulatory texts must be harmonized for a better exploitation. For example, the sectoral codes including the forest, mine, land, law on public hydraulic domain, the law on gazetted areas are not harmonized with the environment code and this leads to misinterpretation. There is need for the forest code to clearly define the status of private and public forests and clarifying modalities for administrative authorization, conditions or procedures of authorization to avoid abusive cases of logging in forests (Articles 45 and 46). On the level of biotechnologies, there must be a regulation on biological resource use, definition of environmental standards.

The laws of Burundi must further be

harmonized with existing laws in the sub-region and especially in the East African Community (EAC). These include the phytosanitary legislation of Burundi on procedures, measures and phytosanitary standards of EAC. These procedures and phytosanitary measures are prepared by Member States of the community to prevent the introduction and dissemination of pests in compliance with Chapter 18, Articles 105-108 of the EAC Cooperation Treaty.

The translation into Kirundi of the various texts and especially the Codes would facilitate their popularisation as they are not known the general populous.

Elaboration of missing laws

For effective management of natural resources in general and of forests in particular, some new laws need to be enacted. They include forest legislation which could give weight to some statements of the Forest Code. Even if the impact of uncontrolled use of fertilizers and phytosanitary inputs is not really quantified, it is obvious that regulation of production and commercialisation of inputs should be well articulated and popularised.

Implementation texts and tools for existing laws

There are many laws which have no implementation texts. A good example is law n°1/014 on liberalization and regulation of the electric energy sector promulgated on August 14, 2000. For the implementation of this law, there is no Office for regulating electricity sectors to allow a big number of the population to participate in the electric energy sector. This could significantly reduce human pressure on forests.

Implementation of International Conventions and Treaties

The national focal points of various international and regional conventions signed by Burundi do not have efficient means to apply planned provisions. There is need to identify priority areas for action and mobilisation of resources for implementation. Negotiations with cooperating partners for funds to implement some of the conventions and treaties should be put in place.

VALIDATION OF PROPOSED REFORMS

The following are suggested ways of validating the proposed reforms

- Analysis and evaluation of the proposed reforms by a multi sectoral team;
- Involvement of policy and law formulation
- Sharing the proposed reforms with partners in the sub region.
- Stakeholder forum to discuss the proposed reforms. This evaluation could be done by such stakeholders in the management and protection of environment as the MINATETP by supporting its central administration services, and the civil society involved in management and protection of environment. It is on basis of results from the evaluation that one would draw conclusion on the significance of reforms.

The process of adoption of proposed reforms

Developing a framework for dialogue and consultation

The proposed reforms involve several stakeholders and many levels. The reform of macro-policies requires intervention of political decision makers from the bottom to the top, NGOs, religious groups and grassroots communities. The process for reforming macro policies requires deep dialogue among various stakeholders. The setting up of a framework for exchange of ideas to reform policies for their harmonization is cardinal.

Sensitization of political decision-makers

The political decision makers are key in the process of adopting national policies on environment. They influence on the progress of draft-laws and their promulgation. The sensitisation of

political decision-makers on environmental problems and proposed policy change could allow speedy reform process. Some decision makers such as local administration authorities (Provincial, Communal and military authorities) are also responsible of management and safekeeping of natural resources in general within their circumscriptions. It is therefore important to involve them in the reform of policies through sensitisation and consultations.

Partnership and networking with stakeholders

Burundi has associations and non-profit organisations involved in environment protection such as the "Green Belt Action" (Action Ceinture Verte). These organisations provide civic education on the importance of conserving the environment. They also have a large following in the environment sector. Forging partnerships with these organisations will speed up and validate policy reform process.

Political and economic analysis of the feasibility of reforms

The political and legislative reform requires funds to carry out related activities. For an efficient reform, interventions must be supported by a sound financial base. It is therefore important to carry out a financial cost analysis of activities to be carried out and possible financial resources required. As for political opportunities, the reforms must coincide with traditional events celebrated in the country such as the tree day and others.

Evaluation of the reforms

It is important to have an appropriate evaluation system for the reform of policies and laws in environmental

management to adjust, if necessary, in order to achieve good results. The impact of reform of policies must be regularly measured in the course of time to allow support intermediate decisions for the boosting of actions.

Setting up of a monitoring and evaluation framework

The formation of the body of an inter-sectoral monitoring and evaluation team would allow efficient assessment of the evolution of policy reform at all levels. As the management of environment is a duty of several ministries and institutions, the members of monitoring and evaluation team must be representative of all key institutions in the environments sector.

Environment management is also a duty of the private sector and the civil society. In order to ensure an efficient monitoring, it is important to engage private sector, NGOs and the civil society in monitoring and evaluation of the reform of policies and laws.

Establishment of an environmental information centre

The centre for environmental information could be a means for disseminating and exchange of ideas. Members of the general public would visit the centre to update themselves with the latest developments in policy and law reforms on the environment. Decision makers such as politicians and legislators would also make contributions through the centre.

Establishment of a public debate

Given that the Burundian context depend on natural resources for different uses and at different levels, a public debate on modalities of environmental management would allow critical review and assessment of the possible impacts of the proposed policy reforms.

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Interviewed

INTERVIEWED PEOPLE

1. BARAJENGUYE Privat Expert au PC RTP
2. BARARWANDIKA Astère Directeur du Département des forêts au MINATETP
3. HAKIZIMANA Bernadette Directeur du Département de l'Environnement au MINATETP
4. HAKIZIMANA Eliakim Directeur du Département de production animale
5. HAKIZIMANA Godefroid Conseiller au Ministère de l'Energie et des Mines
6. KABONEKA Salvator Expert à la FAO
7. KAHONDOGORO Amisi Officier phytosanitaire
8. NDABIRORERE Salvator Conseiller au MINATETP
9. NDAYIRAGIJE Pascal Directeur du Département de Production à l'ISABU et membre de la commission nationale pour l'homologation des pesticides
10. NDIKUMAGENGE Cébastien Directeur Général de l'agriculture
11. NDUWIMANA Joseph Directeur du Département de fertilisation
12. NTAHONDI Emile Chef de Cabinet au MINAGRIE
13. NUSURA Hassan Coordonnateur National D'ATP/NBI et Vice Doyen de la FACAGRO
14. RUZIMA Salvator Coordonnateur National du Projet NTEAPI
15. SABUSHIMIKE Jean Marie Directeur de la Recherche à l'Université du Burundi
16. SAKAYOYA Eliakim Directeur du Département de défense des végétaux
17. SIMBASHIZWEKO Astère Expert au FIDA/PRDRA
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