UNITED REPUBLIC OF TANZANIA

NATIONAL REPORT ON ENVIRONMENTAL ANALYSIS AND MANAGEMENT COMPONENT UNDER PILLAR D OF THE NILE BASIN INITIATIVE OF THE SHARED VISION PROGRAMME

By

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The Report is for GEF/WORLD BANK

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ACRONYMS

NBI	-	Nile Basin Initiative
COM	-	Council of Ministers
SEC	-	Nile Secretariat
UNDP	-	United National Development Programme
CIDA	-	Canadian International Development Agency
SVP	-	Shared Vision Programme
SAP	-	Subsidiary Action Programme
GEF	-	Global Environmental Facility
MCM	-	Million Cubic Meters
NGO's	-	Non Government Organizations
CWB	-	Central Water Board
NEMC	-	National Environment Management Council
NCSSD	-	National Conservation Strategy for Sustainable Development
LVEMP	-	Lake Victoria Environment Management Programme
PAs	-	Protected Areas
NPs	-	National Parks
GPs	-	Game Parks
GRs	-	Game Reserves
NCA	-	Ngorongoro Conservation Area
GCAs	-	Game Controlled Areas
IDA	-	International Development Agency
NARO	-	Uganda National Agricultural Research Organization
KARI	-	Kenya Agricultural Research Institute
TANAPA	-	Tanzania National Parks Authority
TFAP	-	Tanzania Forestry Action Plan
TAFIA	-	Tanzania Forestry Industries Association
HESAWA	-	Health through Sanitation and Water
USRP	-	Urban Sector Rehabilitation Project
BRA	-	Bureau of Resources Assessment (University of Dar es Salaam)
LANESO (NGO)		Nyanza Environment and Conservation of Nature
LAVECO	-	Lake Victoria Environment and Conservation
(NGO) SGS	-	Green Shinyanga Group
(NGO)JET	-	Journalist Environmental Association
(NGO)KCF	-	Kagera Credit Fund
(NGO)WWF	-	World Fund for Nature
(NGO) WCS	-	Wildlife Conservation Society

1.0 BACKGROUND AND INTRODUCTION

1.1 BACKGROUND

Nile river basin is shared by 10 riparian countries vis: Burundi, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda. Half of these countries are among the world's ten poorest countries. Today the Basin is characterized by poverty, instability, rapid population growth, and environmental degradation. Control of Nile Waters has long been a source of dispute and potential conflict in the region. Yet the Nile also holds great potential to foster regional social and economic development through power generation, food production, transportation, trade, environmental conservation, and other related development activities. To realize this potential, the riparians have come to recognize that they must take concrete steps to address these challenges and that cooperative development holds the greatest prospect of bringing mutual benefits to the region.

The Nile riparians have taken a historic step towards cooperation in the establishment of the Nile Basin Initiative (NBI) which was formally launched in February 1999. The initiative is a transitional institutional mechanisms that provides an agreed basin-wide framework to fight poverty and promote economic development. The NBI is guided by a shared vision "**to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin Water resources".**

The NBI is composed of the Council of Ministers of Water Affairs of the Nile Basin States (Nile-COM), a Technical Advisory Committee (Nile-TAC) and a Secretariat (Nile-SEC) located in Entebbe, Uganda. The formation of the NBI and on-going riparian dialogue is supported by the World Bank, UNDP and CIDA.

The NBI has articulated the shared vision, established a transitional institutional mechanism, and formulated general guidelines to facilitate cooperative development in the Nile Basin. To translate the vision into action, the NBI has also initiated a Strategic Action Program, which includes two complementary components as (1) a basin-wide Shared Vision Program (SVP) and (2) Subsidiary Action Programs (SAP). The SVP will include a series of projects, such as capacity building, studies and participatory activities to be implemented basin-wide to create an enabling environment for cooperative development. In parallel, appropriate groupings of countries (two or more) will initiate SAPs to define and implement investment projects that confer mutual benefits at the sub-basin level.

The SVP encompasses the following five broad theme areas, referred to as 'pillars':-

(i) Cooperative Framework (on-going UNDP sponsored D3 project);
(ii) Confidence Building and Stakeholder involvement (Pillar C);
(iii) Socio-economic, environmental and Sectoral Analyses (Pillar D);
(iv) Water Resources Planning and Management (Pillar E);
(v) Applied Training (Pillar F).

Pillar D addresses five components as follows:

- Efficient water use for agricultural production;
- Socio-economic/poverty diagnostic study;
- Assessment of opportunities for power trade and pooling;

- Environmental analysis and management and;
- Opportunities for integrated infrastructure development.

There is a clear recognition within the Nile Basin Initiative that the development of Nile waters must be environmentally sustainable in the long-term. This is reinforced by the fact that the Nile is widely perceived as an environmental issue of global concern. Identifying the environment and development synergies, and thus the sustainable development opportunities, will be a major task for the initiative.

The Environmental Analysis and Management component of Pillar D will contribute to developing a strategic framework for environmentally sustainable development of the Nile River Basin, improve the understanding of the relationship between water resources development and the environmental in the Basin and, provide a forum to discuss development paths for the Nile with a wide range of stakeholders.

Environmental management studies and actions in the Nile Basin have thus far been largely undertaken on a national basis, and not with a trans-boundary vision. The present component will help translate existing national environmental commitments and interest into regional and basin wide analytical frameworks and eventually basin-wide action. It will consist of two sub-components with one output funded by the GEF and the other output funded by the USAID. The GEF resources will support the preparation of a basin-wide environment project, which will be presented to ICCONI. The USAID resources will support a trans-boundary environmental analysis which will produce a study and serve as reference for relevant information. The environmental analysis and management component of Pillar D will also co-ordinate with two other Pillars (Pillar C [confidence building and communication] and F [applied training and capacity building])

This report identifies the specific studies and preparatory work within the Environmental Analysis and Management component of Pillar D.

1.2 INTRODUCTION

Lake Victoria is the source of Victoria Nile. The Lake lies across, the equator between latitudes 0 31'N and 3^{o} 54`S and between longitudes $31^{o}$ 81` to 34^{o} 54`E. Lake Victoria is shared between Uganda, Kenya and Tanzania. The lake with an average depth of 80m is contained in a wide basin at 1124 meters above sea level. The surface area of the lake is estimated to be 69,000 km^2. The catchment of the basin in the Tanzanian side is 49% of the total catchment area of the basin which is 115, 380 km^2

In Tanzania, the Lake Victoria Basin comprises of Kagera, Mwanza and Mara regions and a very small part of Shinyanga region. The area of the Lake basin in Tanzania is 80,000 km^2. The Lake Victoria catchment area is drained by a number of perennial and seasonal rivers which empty their waters into the lake. The most important rivers are Kagera, Simiyu, Mbaraget, Gurumet, Mara, Mori, Isanga, Magogo, Ruwana, and Duma. Kagera River originates from the humid Burundi and Rwanda while Mara river originates from the highlands in Kenya. Rivers in the Tanzania side contribute 9956 million cubic meters (MCM) of water to the lake annually (Table 1.1 and map 1.0).

River name/ gauging station point	Catchment area (Km2)	Catchment yield MCM
Kagera Nyakanyasi	48,427	6,934
Ngono/Kyaka rd. Br.	2,611	657
Mara/Mara mines	15,000	990
Simiyu/ Rd. Br.	10,200	878
Gurmet/ Rd. Br.	9,210	347
Mbaraget (BR)	3,180	150

Table 1.1: River distribution in the Tanzania side of Lake Victoria Basin.

Tanzania's economy principally depends on agriculture which includes crops and animal husbandry. Over 80% of the population of 5.5 million people living in the Lake Victoria Basin live in the rural areas occupied in subsistence agriculture. Those who live in urban areas are engaged in industrial activities, fishing, tourist business, forestry and communications in the lake. The agricultural activities, including industrial, tourist, fishing forestry and communications they all have some environmental impacts on the water, resources in the basin. Most of the activities in the basin however do not aim at conserving the environment and making it sustainable.

The Lake Victoria Basin has 19 Agro-ecological zones with different types of soils ranging from weak dark brown to reddish sandy loams in Coastal Bukoba highlands to the clay loams in the southeastern part of the basin. Maize, millet sorghum, chickpeas, cassava, and sweet potatoes are the major food crops in south and eastern part of the basin namely Mwanza and Mara regions. Cotton is the major cash crop for the two regions. Food crops grown in the western part of the basin (Kagera region) include bananas, cassava, rice, sweet potatoes and Legumes. While coffee, tea and sugar canes are the major cash crops. Topography, climate and soil types influence the kind of agricultural activity. Rainfall in the basin ranges from 600mm to 1,800mm annually. While average mean maximum and minimum annual temperatures being 17oC and 30^{o}C and 17^{o}C respectively.

Rainfall in the Lake Victoria basin varies over the lakes' surface and the surrounding land area. Over the Eastern area of the lake rainfall is between 500 and 750 mm per year. Westward from this area rainfall increases to an annual average of over 2,000mm in areas around Bukoba and the Ssese islands. To the south of the lake in Mwanza region, the yearly average rainfall ranges from 750 to 1100mm. In Tarime District of Mara Region rainfall ranges between 1250 – 2000mm while rainfall in the central zone covering Musoma Rural District and the eastern part of Serengeti ranges between 900-13mm/year. In Bukoba region, rainfall range between 800 to 2,000 mm/year.

Lake Victoria Basin has a number of perennial and seasonal rivers draining into the lake. The rivers are Kagera, Simiyu, Mbaraget, Gurmet, Mara, Mori, Iganga, Magogo and Duma. Of these rivers Kagera originates from Rwanda and Burundi while Kagera originates from the Kenya highlands. The rivers which contribute 9956 million cubic meters (MCM) of water to the Lake annually are important wetlands but the quality of their waters is mostly degraded before reaching the lake by pollution. These are also major sources of sediments to the lake. Lake Victoria basin has in general high potential of ground water resources. These resources however are not evenly distributed. High potentials are found in Musoma, Bunda, Ngara and Magu and parts of Bukoba district. Karagwe and Geita have medium while the rest are recorded to have low potentials.

Lake Victoria has also a lot of water (11,993,184 m3/d) surface water and a relatively large potential of ground water. The resource, however, has not yet been fully exploited for the benefit of the 5.5 million people living in the basin. The water demand is higher in the urban areas of Mwanza, Musoma and Bukoba towns. Water supply coverage in urban areas estimated at less than 80%. The water supply coverage in the rural areas is equally low about 50%. Apart from water demand for domestic use, the water is also used for industrial and irrigation use. The quality of the water in the lake is being degraded by domestic, industrial and agrochemical pollution.

The population growth rate in the basin is estimated at 2.9%, The high population growth rate results in increased agricultural activities, fishing and livestock keeping. Fishing is an important economic activity as the fish caught are sold outside and inside the country bringing substantial income to the fishermen and the fish processing industries in Mwanza, Musoma and Bukoba. Agricultural activities have resulted in most of the land being cleared resulting in soil erosion also fertilizer application for increased yields has resulted in some of the fertilizers and other agrochemicals to find their way into the lake, swamps and some of the rivers.

Overgrazing has brought about the problem of soil erosion resulting in accelerated siltation in the lake and rivers including Simiyu river in particular.

Water hyacinth and the spread of water weeds in the Lake and Kagera river has been due to the introduction of domestic and industrial wastes and agrochemicals in the water bodies. Rapid population growth in the rural and urban centres has outpaced town and village planning programmes as a result in most parts of the towns, urban waste water management infrastructure is either missing of needing major rehabilitation. Industrial and domestic wastes are either partially treated or not treated at all when they are discharged into the lake. Lack of sanitation facilities in the rural areas also contributes substantially to the eutrophication of the water bodies.

The major wetlands of Lake Victoria basin are lower Kagera lakes complex and flood swamps, the Mara river Masirori swamp and the Lake Victoria itself. The lower Kagera lakes complex is a group of lakes and the adjacent flood plain. North of the lakes is the Rusumo falls in Ngara district at the border with Rwanda. The swamp which mainly lies in Rwanda has an average of 1,000 km^2. Masirori swamps which is located in the middle of Mara river on the north western part of Serengeti National Park is permanent with an estimated area of 30,000 hectares. A large area of the flood land in the basin has been designated as potentially suitable for irrigation development. Around the Lake regions more than 30 Irrigation projects have been identified. The schemes include Ngono river rice project, Kagera sugar plantations and Mara river sugar plantation project. The wetlands are facing problems of deforestation, overgrazing and agricultural activities. The wetlands which are not in protected areas are potential agricultural areas by peasants who practice shifting cultivation.

Lake Victoria basin has substantial hydroelectric power potential along Kagera and Mara, of major importance is the proposed Rusumo falls hydroelectric power station.

Studies have been carried out on potential sites along Ngono, Kishanda valley and Mara river (Table 1.2)

	FIRM ANNUAL ENERGY	PROPOSED CAPACITY (MW)
1. Kagera/Rusumo falls	270	80
2. Kagera/ Kishanda villages	740	170
3. Kagera/Kakono	260	40
4. Mara river	397	90

Table 1.2: Hydroelectric power potential along Kagera and Mara Rivers

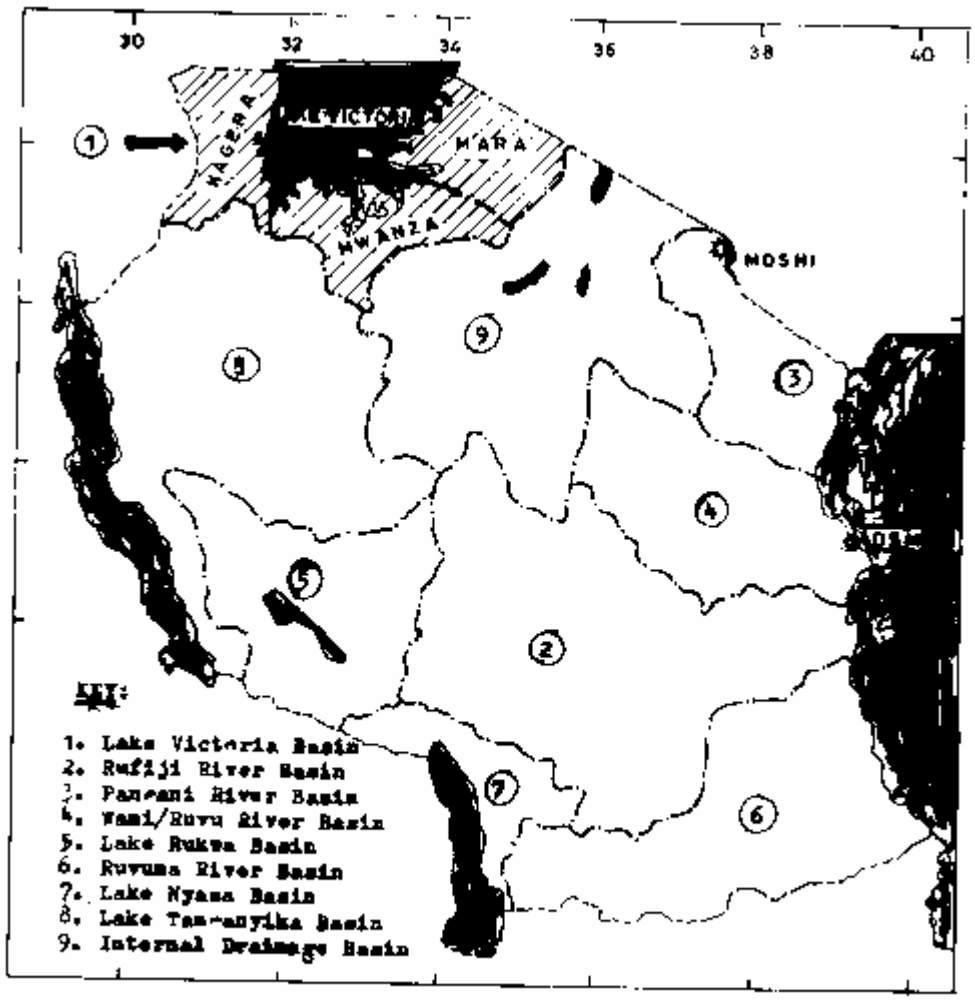
The general vegetation cover in the Lake Victoria basin comprises of swamp forests, which occurs on alluvial deposits at the Kagera River mouth. Remains of humid evergreen tropical forests still exists in the eastern and western shores of Lake Victoria. Some of the most important plant species are *Antbocleista, Schweinfurthii, Erythrina excelsa, Macaranga monandra, M. Schweinfurthii, M. Spinosa, Parkia filcoidea, Uapaca guinnensis, podocarpus falcatus, Baikiea ensignis, Maesopsis eminii, Apodytes dimidiata, Strombosia scheffleri and coton megalocarpus.*

The most predominant natural vegetation in the eastern side of the basin is the savanna type of vegetation in Mara region, which is associated with the rainfall which is between 900 – 200 mm per annum and cover most soil types found in the region especially the sandy loam soils. The Serengeti plains are characterized by the Savannah type of vegetation with predominant forest vegetation. The most predominant trees include Acacia, (*comniphora species) Focus hoschiteteria, pdocarpus, Usambaran, Khaya Nyasica; (Oleo species) Cordia African (Combratum species) Markhamia laty calyx, Grevellea robusta, Bohemia; (Eryphian species) Kigelia ethispiza etc.*

Lake Victoria Basin is within the moist forest mosaic and the *brachyotegia julbernardia* savanna woodlands. The basin is basically rich in plant species, poor in endemic plants probably due to heavy human pressure due to cultivation, grazing and fuel wood collection. More than 20% of the forest has so far been lost. The basin is also very reach in birds and butterfly. Urgent action is needed to protect the forests as these have an impact on the existence of the water resources in the basin.

The Lake Victoria basin is one of the richest part of Africa as far as bird diversity is concerned. About 15% of the passerine birds are found most of them endemic to the zone, which is also relatively rich in butterflies with 270 species not recorded earlier in Tanzania and among which several are new to science. The black mangabey monkey occurs abandantly in Minziro and no where else in Tanzania. The Minziro forest has a tree hyrax which is very different from the tree hyrax in other parts of the country and it is not found anywhere else in the country. Lack of the environmental protection awareness to the public and enforcement of environmental regulations have negative impact on biodiversity in the basin.

Mining is an activity which takes roots in the basin. Due to lack of Environmental Impact Assessment before the mining exercise and crude mining techniques by the small miners, the quality of the water resource in the mining areas is constantly being degraded.



MAP 1.0: DRAINAGE BASINS OF TANZANIA

Environment conservation in the basin is retarded by the fact that large areas of agriculture and forestland are lost each year owing to inadequate management of the natural resources. The hydrological balance and the water quality in the lake is deteriorating from sedimentation caused by basin deforestation and poor land use practices as well as industrial and urban pollution and through encroachment by the water weeds in the water resources.

The presence of water weeds along Kagera river system and shores of the lake, presents a major threat to the water resources, the ecosystem and biodiversity of the lake.

2.0 DESCRIPTION OF NATURAL RESOURCES IN THE LAKE VICTORIA BASIN

2.1 Land Resources:

The land area of the Lake Victoria basin is 184,000 Km2. The land covered by Lake Victoria basin in Tanzania is 46% or 90,160 Km2 of the lake catchment. The land

resources in the basin include the highlands, wetlands, rivers, rangelands, minerals and soils. The land area in the basin is endowed with diverse flora and fauna and it is the primary resource base for human activities and provides life for 5.5 million people which is 18% of the total population of Tanzania.

The basin has the highest population in the country and in East Africa. The high population pressure in the basin has had negative impact on the land use management practices which in turn has resulted in degradation of the land and the natural resources.

The Lake Victoria basin is the major source of fish. Fish caught in Lake Victoria are consumed and sold inside and outside the country. The basin is also important in coffee and sugar production. The basin is also important in terms of wildlife. The vast lowlands plains in the southern part of the basin, Mwanza and Mara regions, support large pastoral livestock which is part of the major occupation of the people living in those areas. Flood plains are used for seasonal crop production and they are most important for production of seasonal crops in the semi arid areas. Land resources are the first important physical entity next to water resources.

2.2 Water Resources

The water resources in the basin include surface and groundwater. Apart from Lake Victoria and rivers Kagera, Ngono, Mara, Simiyu, Curmet and Mbarageti, there are a number of dams and charcos, shallow wells and deep boreholes in the basin. Despite all there water sources, the present domestic water supply coverage for the rural is low; just over 50%, necessecitality people to draw water from grossly polluted sources.

The urban water supply coverage for the towns of Mwanza, Musoma and Bukoba around the Lake stands at 83%. Water supply and Sewarage Authorities have been created by an Act of Parliament to oversee the water supply and sewerage activities in the towns. The Authorities are run by using the income generated through the water supply and sewerage services which they offer to the town communities (Table 2.1).

Town	Population	Water Demand	Water Supply Coverage	Sewarage Coverage
Mwanza	420,000	77,700m^3/d	75%	20%
Musoma	94,000	24,835m^3/d	73%	Nil
Bukoba	73,800	7444m^3/d	94%	Nil

Table 2.1: Populations water demand, water supply coverage in Mwanza, Musoma and Bukoba towns around the lake

Water resources in the basin are used for fishing mainly Lake Victoria, small scale irrigation and livestock. It is estimated that about 3,000 hectares are currently under irrigation and more that 4,500,000 livestock are in the basin using the water resources. The high population pressure in the basin as well as the large number of livestock exert high pressure on the water resources.

The quality of water in the water resources is degraded by domestic and industrial water pollution as well as agrochemicals such as fertilizers and pesticides.

2.3 Forest Resources

Lake Victoria Basin is within the moist forest mosaic and the *brachyotegia julbernardia*

savanna woodlands. The basin is basically rich in plant species, poor in endemic plants probably due to heavy human pressure due to cultivation, grazing and fuelwood collection as more than 20% of the forest has so far been lost.

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The basin which was endowed with forest resources, many of those resources have now been depleted. High population pressure on the basin has led to mismanagement of the resources due need of land for settlement, cultivation, clearing of forests for construction materials, woodfuel, medicine and feeding animals. Overgrazing of the large numbers of cattle kept by the villages and bushfires have all contributed to the clearing of the forests. It should also be pointed out that political instability in the neighboring countries of Burundi and Rwanda has resulted in the influx of refugees in Muleba, Karagwe, Ngara and Biharamulo. The refugee problem has greatly escalated the forest clearing problem in the basin; the Benaco refugee camp alone has manage to clear and degrade 690 Km^2 of land in Kagera region.

It is estimated that only 35% of the land area in the basin is covered by forests or woodlands. The least land covered by forest is in Mwanza region where only 35,187km^2 is covered by forest. This is 0.68% of the total regional land area. The highest land area covered by forest Kagera region where 51% of the land area is covered. Mara region however has the lowest forest potential. There are no substantial natural forests and government forest plantations; there are only a few forest resources.

There are ongoing government at central regional and village levels efforts to protect forests. Protected forests of forest resources have been established. In total there are 80 forest reserves and 10 proposed forest reserves in the basin.

Wood-lots are being established to complement the efforts of setting aside areas as forest reserves to conserve the environment. The raising of tree seedlings for distribution has been going on for several decades but quantities have always been negligible given the huge demand for afforestation. Principal actors in wood lot establishment and management are villages, institutions such as schools, NGOs, and individuals.

2.4 Fisheries Resources

The Lake Victoria basin is well endowed with fresh fish resources. Important rivers

entering the lake include Kagera River, Ngono river, Mara river, Simiyu river, Gurmet river and Marangati river where fishing activities at smaller scale are in progress.

Fishing in Lake Victoria is carried out by local fishermen who number about 20,064. Many of the fishermen use traditional fishing gear and few use outboard engines. There has been an increasing number of persons and vessels involved in fisheries activities in 1996 compared to 1993. Fishing earns the region and the country a large income. Annual sales of fish fillet are estimated at more than Tshs. 19 billion annually.

The type of fish in Lake Victoria includes:

		*
Tilapia variabilis (T.V)	-	Mbiru
Tilapia esculanta (T.E)	-	*Sato*
Claria Mosambia	-	*Kambale*
Protopretus aethipicus	-	*Kamongo*
Dagrus docmac	-	*Mbofu*
Labeo victorianus	-	*Ningu*
Schilble Myatrns	-	*Nembe*
Hapalochoris spp.	-	*Furu*
Sysnodontis spp	-	*Ngogo*

* Swahili name

The fish trend in the lake is that many fish species are disappearing due to introduction of the Nile-perch in the lake, poor fishing methods and use of dynamite in fishing. Another problem which is threatening the fish in the lake is pollution of the lake and growth of water weeds.

2.5 Wildlife Resources

The Lake Victoria basin is rich in wildlife. The game reserves of Bugiri Game Reserve (2,200 Km^2), Ibanda Game Reserve (200 Km^2) Rumanyika Game reserve (800 Km^2), Biharamulo Game reserve, Kijirashi Game reserves (67Km^2), Saa Nane Island Game Reserve (0.5 Km^2), Robondo Island Game Reserve (456.8 Km^2), Gurmet Game reserve (1,973 Km^2) and Ikunga game reserve (1,860Km^2), and several game controlled areas in the basin contain diverse species of wildlife. One of the major problems being faced by the game reserves is encroachment of the reserves by villagers who seek land for settlement, cultivation and harvesting the animals for food and trophies. The refugees problem in the basin has also degraded the game reserves as the refugees engage themselves in illegal hunting and tree clearing in the parks. Wildlife is also a source of revenue from tourists. It substantially increases the regional and National GDP's. The animal species in the basin range from the picturesque zebra to the warthog, from the small dikdik to large elephant, from the graceful giraffe, the grass grazing buffalo to the predator lion. There is a lot of variety of animals in game reserves and controlled areas.

Wildlife revenue obtained comes mainly from the sale of game meat and game trophies. The total revenue showed a remarkable size between 1945 and 1991, there after it dropped drastically. In Kagera Region for example the 1995 total could also have been affected by heavy poaching by refugees. The drop in the value of revenue is even more telling when converted into United states dollars (Table 2.4).

Year Revenue	1985	1987	1989	1991	1993	1995
Tourist Hunting	69,988.55	1,379,324.90	5,346,240.00	11,656,167.00	9,388,000.00	5,187,000.00
Local hunting	24,181.00	72,950.00	NA	230,483.00	65,900.00	102,400.00
Miscellaneous	175,780.00	12,467.00	15,583.00	35,180.00	36,400.00	410,000.00
Total Tshs.	269,949.55	1,464,741.90	5,361,824.00	11,921,830.00	9,490,300.00	6,799,400.00
Equivalent US$	16,360.95	17,499.90	27,926.16	50,947.99	19,771.46	10,792.70

Source: Regional Game Office Bukoba 1998 and Kagera Regional Development Programme 1999

Table 2.2: Revenue Collected from Wildlife Conservation Area 1985 to 1995

Mara region in the basin is bestowed with wildlife potential. This is due to the fact that a big portion of the Serengeti National Park is in this region; covering an area of 14,763 sq.km. Serengeti designated a s a National Park in 1952, is divided into three parts namely, Game reserve, Game controlled area and open area.

Speke Gulf controlled area (Bunda district) is facing a problem of frequent invasion by people from Tamau and Nyatwali villages. Their settlement in the Game controlled Area (Speke Gulf) is causing serious environmental degradation, game poaching and migration of some of the wildlife such as wildebeest which are easily scared by people presence.

Poaching is another main problem for wildlife in this area. Between the year 1990 and 1995 the number of poachers netted was 811. In order to mitigate poaching tendencies in the National Park the Government formulated the Serengeti Regional Conservation Strategy whose implementation began in 1988/89.

Mwanza region is not well endowed with wildlife compared to other regions in the country. It has only a small game reserved area. Due to a very limited game reserved area the wildlife/tourism activities are minimum in the region. The only activity related to wildlife is local hunting.

2.6 Livestock

The basin has about 3.0 million cattle which is about 30% of all the cattle in the country. There are also other types of livestock (goats, sheep, pigs and mules) amounting to about 1.5 million. The cattle density in the basin is around 13 per sq km.

Livestock provides food, cash income and manure for soils. Livestock population in the region has added pressure on the land and many areas to day are experiencing overgrazing resulting in environmental problems like soil erosion.

Lack of grazing land due to drought and the land being heavily degraded to the extent of becoming a semi-desert, has resulted in livestock keepers in the southern part of the basin (Mwanza region) to migrate to other areas of the country in search of grazing land.

2.7 Mineral Resources:

The Lake Victoria Basin has a large potential for minerals. Mining in the basin is yet to be fully developed. Some activities are however going on:

Gold is mined in Geita, Sengerema, Kwimba and Magu districts in Mwanza region. At

present there are more than 30 big companies prospecting gold in Geita districts. While gold prospecting by big companies is going on, small miners are going on with the digging. In Sengerema and Magu district large scale prospecting is at initial stages while in Kwimba there is both small scale mining and large scale prospecting at initial stages.

Mining in Mara region is undertaken by small-scale miners. Therefore contribution of mining sector to GDP has tended to be very low. Since early 1990's the Government allowed the Bank of Tanzania to buy gold directly from small scale miners and this improved tremendously the volume of gold scales. Mining sector in Mara region and the country as a whole is lacking reliable market. The lack of transparent market is the main root cause of gold smuggling.

The mining sector has been of some importance to the Kagera region in recent years. In the colonial past, Karagwe district showed some activity around the tin, nickel and iron ores in the district but the lack of hydro-electric power has frustrated efforts of exploitation. The hydro-power line in question is the Kikagati/Murongo-Keisho-Kyerwa line. Meanwhile considerable exploration is going on. Many foreign companies are involved in this exercise. But until results start coming in mining will continue to be the least economic activities in the region. The region major prospector is Kagera Mining Company who are evaluating nickel deposits in Ngara region. Kyerwa tin mine may be re-opened.

3.0 MAJOR ECONOMIC ACTIVITIES

The major economic activities in the basin are agriculture, Livestock keeping, fishing, forestry mining and tourism.

3.1 Agriculture

Over 80% of the 5.5million people in the basin live in the rural areas and are engaged in agriculture.

Land is the major potential resource for the 5.5 million people living in the basin. It covers 70,666Km2. Agriculture contributes about 50% of the regional economy in the basin. Land area under cultivation in the basin amounts to 11,940 km^2 which is about 12% of total land area in the basin.

Major food crops grown includes bananas, beans, maize, cassava and sorghum, millet, sweet potatoes and chickpeas. Cash crops include Arabica and Robusta coffee in Mara and Kagera regions and cotton which is grown in the three regions of the basin but mostly in Mwanza and Mara region. Sugar canes are also grown in the flood plains in Kagera region.

Irrigation Agriculture

Irrigation agriculture is not very well developed in the basin. The presence of lake Victoria has in the past led to great expectations for irrigated agriculture in the three regions within the basin. Unfortunately these expectations have ended in disappointment. Virtually all abandoned and existing schemes and most of these under construction in the three regions in the basin are pumped, usually from the lake and they depend on diesel for pumping.

A big portion of Mara Region is surrounded by water from the lake but the people have shifted from rain agriculture to irrigation farming. Irrigation potentials in Mara region lies in Bugwema Giant, Musoma District ; Butiama Irrigation and Tamau (Bunda district). In addition there are 14,720 hectares in Tarime district and 2,200 hectares in Serengeti. This gives a total of 32,000 hectares of suitable irrigation land.

In Kagera region the most successful irrigation development in the Rulenge village project which concentrates on self-help installation of drainage and partial supplementary irrigation to the flood plains of Kagera river valley. The region has enormous potential for irrigation. The waters of Lake Victoria Ikimba lake , Burigi lake and the rivers Kagera and Ngono are all enormous sources. This is in addition to the enormous groundwater potential.

Despite these resources of water very little has been done to develop irrigation. It could be that the people in the region with a good bi-modal rainfall see little advantage in the exercise.

The little irrigation that has been carried out is at Kagera Sugar Estate. There are also minor traditional irrigation practices which bring water to banana and coffee plots. Apart from sugar estate another 38,089 (ha) scattered all over the region has been identified as potential areas for traditional irrigation and where a start has been made to exploit the potential.
These areas are as in Table 3.15 below.

District	Name of Area	Traditional Irrigation Potential (Ha)
Biharamulo	1. Buzirayombo	200
	2. Chato	150
	3. Nyakato	120
	4. Masasi/Kibehe	450
	5. Musasa	70
	6. Makurugurusi	200
	7. Mwiruzi	Not known
	Sub Total	**1,190**
Bukoba (R & U)	1. Nkenge	2,300
	2. Kajunguti plains	1,300
	3. Kyakakera	1,500
	4. Kyamato	1,500
	5. Kanyigo	12,000
	6. Bugorora	3,000
	7. Busharago	2,000
	8. Kibirinzi	200
	9. Kibitinzi/Kajunje	100
	10. Kaja	2,000
	11. Busharankolo	Not known
	12. Nyamuheshera/Kyamugera	Not known
	Sub-total	
Ngara	1. Rwinyana	40
	2. Mpayuka	110
	3. Bigambo	80
	4. Mwiruzi	80
	5. Mugozi	120
	6. Mubuhenge	86

	7. Magamba	88
	8. Kabanga	Not known
	9. Nyabihanga	Not known
	Sub-total	604
Karagwe	1 Kishoju	1,000
	2 Kyabayanda	50
	3 Kandegesho	500
	4 Kihanga	3,000
	5 Maguge	25
	6 Kaband	2,500
	Sub total	**7,075**
Muleba	1. Kyamyorwa	1,500
	2. Burigi	1,000
	3. Mulelezi	700
	4. Buyega	120
	Sub-total	**3,320**
GRAND TOTAL		**38,089**

Source: Regional Irrigation Department, Bukoba, 1998
Table 3.1: Potential irrigation areas and acreage in Kagera region

Agricultural prospects in Mwanza region have limited scope for raising yields, except through controlled application of water. Although it is possible to increase fields through better soil management, fertilizer application and improved varieties, dramatic improvement depend upon irrigation agriculture. Rainfall is less, and irregular in much of the region for production to be reliable. By the end of the century the population will increase in the basin thus to ensure food self sufficiency it will be necessary to develop irrigation agriculture. The region has only 650 ha which are being irrigated.

3.2 Fishing

Fishing is the second major activity employing about 10% of the 5.5 million people in the basin.

Fishing activities have increased tremendously after the liberalization policy which was introduced by the Tanzania Government in the 1980's. The policy gave room to the private sector to involve itself fully in the economic activities of the country where fishing is one of those activities.

Fishing activities are major sources of revenue to the population in the basin and the government in terms of taxes. The earnings have been increasing year after year. In 1996 for example Tshs. 22.6 billion were earned from the fish sales in the country and outside the country. The fish industry has been growing and fish processing industries have now been constructed in Mwanza, Musoma and Bukoba. The lake has many different types of fish and is annually capable of producing 200,000 tones of fish without changing the fish balance. Although fishing is still dominated by small fishermen in the towns and villages surrounding Lake Victoria, fish processing and trade is gradually being taken over by large scale operators who aim at fish exporting.

3.3 Livestock

Livestock keeping is the third major economic activity in the basin. Presently there are more than 3.0 million cattle in the basin with the largest concentrations being in Mwanza Region. Cattle population are Mwanza 1.6m, Mara 1.2m and Kagera 0.5m. This is in

addition to large numbers of goats, sheep and pigs.

In Mwanza region it is usual for a peasant to keep more than 1,000 cattle. This is considered to be a sign of wealth. The region has the highest livestock density in the country.

Refugees from Rwanda and Burundi in Kagera region are to blame for drastically reducing the livestock herds in the region.

The over population by humans and livestock in the basin has put a negative pressure on the environment. Mwanza region for example, has been depleted of, its forests cover, and vegetation land cover due to overgrazing, resulting in soil erosion.

3.4 Mining

Mining is an economic activity which is growing fairly fast in the basin. The mining sector has been of some importance in recent years. In the colonial past, Karagwe district in Kagera region showed some activity around the tin, nickel and iron ores in the district but the lack of hydro-electric power has frustrated efforts of exploitation. The hydropower line in question is the Kikagati/Muroro-Kaisho-Kyerwa line. In Kagera region the major prospector is Kagera mining company which is evaluating nickel deposits in Ngara district.

In Mara region mining is undertaken by small scale miners, therefore, contribution of the mining sector to the GDP in the region is low. In Mwanza region however there is active gold mining at Geita, Sengerema, Kwimba and Magu districts. At present there are more than 30 big companies prospecting gold in the gold mining areas in the region.

The number of people benefiting from the exercise have not been accurately assessed in the basin. However mining is a major occupation after agriculture, fishing and livestock keeping. Mining activities, however, are having negative impacts on the environment as forests have to be cleared in mining areas and there is gross pollution of some water bodies in mining areas especially areas where gold mining is carried out by small scale miners. There has also been a problem of mines being left unfilled when they are abandoned by the miners.

3.5 Tourism

Tourism is one of the major economic activities in the basin. Lake Victoria apart from being the second fresh water lake in the world, it is rich in tourist attractions; it has nice beaches such as Makoko where tourists interested in speed boat and scuba diving would find the lake very interesting. Lake Victoria basin encompasses part of the Serengeti National Park which is Africa's most famous game reserve. The park has a variety of animals and bird species. One of the wonders of the park is the famous animal migration. It is in the park also where the oldest recorded remains of man was discovered by Dr. Leakey.

Apart from Serengeti National Park, there are 11 game reserves and 5 game controlled areas in the basin/ There are also a number of forest reserves.

The national park, game reserves and forest reserves are major sources of revenue. They however face problems of poaching illegal forest harvesting and encroachment.

3.6 Industry:

The existing industrial infrastructure in the basin needs to be strengthened. There is large scope for potential investors to invest in agro-industries, mining activities, fishing activities medium sized industries such as textile mills, vegetable oil mills, animal feed, sugar industry, fruit canning, medium sized meet processing and packing plants and dairy products processing plants. The infrastructure contributes substantially to the country's economy and employs a good number of people.

Environmental Impact of Economic Activities in the Lake Victoria Basin

The major economic activities in the basin has led to the environmental degradation in basin. Pollution of Lake Victoria by domestic and Industrial Wastes have accelerated the growth of water weeds in the lake. Also, over population by human and livestock especially in Magu, Kwimba and Misungwi in Mwanza region, has put enormous pressure on the land. In such areas the land has been depleted of any forest cover, overgrazing and the accompany evil of soil erosion is rampant. Over cropping has reached such an extent that soils no longer respond adequately to chemical fertilizers.

The lack of forest cover has led to soil erosion and generally compounds the depletion of soil fertility of the over cropped and over grazed lands. Fuel wood is hard to come by and has to be brought in from long distances. The most damaging result of the environmental degradation is its influence on climate. Mwanza, Shinyanga and a certain portion of Mara region now experience low, inadequate and erratic rains where before the rains were plentiful and reliable.

What is being done to redress encroachment in certain areas of the basin is praise worthy but inadequate. Afforestation efforts should be increased. The search for alternative sources of energy should be taken seriously, electricity supply as an alternative.

In fishing, the use of wrong net sizes and dynamite is damaging the fish bio-mass. The introduction of the Fresh Water Fishing Act of 1994 counter acts these evils and so protect the lake and its biodiversity.

Industrial and domestic pollution of Lake Victoria in the urban cadres in Mwanza, Musoma and Bukoba has reached an alarming stage. Apart from on going effort of the lake Victoria Environment Management programme, little seems to have been done to readdress the situation. Some NGO's are working with people of Mwanza, Mara and Kagera to weed out the water hyacinth plant.

4.0 LEGAL AND INSTITUTIONAL FRAMEWORK

In Tanzania there are more than a hundred pieces of sectoral legislation which touch on some aspects of the management and conservation of environment. Currently a number of institutions and organizations are involved in the management and enforcement of sectoral legislations. These institutions include forestry, agriculture, fisheries, minerals, water, wildlife, local government authorities and NGOs.

4.1 Legislation

Environmental legislation in Tanzania is comprised of about one hundred Acts, Ordinances and subsidiary legislation which in one way or the other deal with environmental management.

Since independence Tanzania's environment has been managed in a similar way as it was in the colonial era. Most of the ordinances enacted during that time remain in force today. The legislation might have been relevant for the prevailing condition at the time of formulation but it has become inadequate for the new conditions that have been brought about by rapid development, economic restructuring which Tanzania is currently undergoing and the contemporary trends on environment protection and resource management.

As mentioned above, environment protection and resource management has predominantly been sectoral, a situation that has facilitated the growth of desperate regulatory regimes and institutions some with overlapping roles. Thus, enforcement of environment protection and resource management related legislation has been generally ineffective, in part because of difficulties in implementing the inherent cross-sectoral nature of such legislation.

Below, are some of the Acts, Ordinances and Regulations that address environment protection and resource management in Tanzania. As mentioned above, there are too many of them to be discussed in this report I will therefore discuss those which of I consider to be relevant for this report.

4.1.1 Water Legislation

The Waterworks Ordinance, Cap. 281, Urban Water Supply Act No. 7 of 1981 and the Water utilization and Control Act No. 42 of 1974 (as amended) address water pollution issues directly.

(i) The Water Utilization (Control and Regulation) Act 42 of 1974 as amended by the Water Utilization (Control and Regulation) [Amended] Act, 1981.

This legislation defines water as all water flowing over the surface of the ground or contained or flowing in or from a spring or stream or natural lake, swamp or in or beneath a water course. The Act vests all such water in the United Republic of Tanzania. It puts in place a regime of water rights to govern access to water use.

Section 17 – impose in every water right the duty to treat or modify discharges into receiving water in accordance with prescribed standards. The section requires water right owners to make periodical returns to the water officer in such form and at such intervals as the Minister may prescribe, setting our nature of wastes or effluents produced by his use of the water and, requires the owner of the water right to install or, facilitate the installation at the point of discharge all machinery and other facilities necessary for the taking of samples and the collection and treatment of effluents.

Section 15 A(1) – provides that, no person may discharge effluents from any commercial; industrial or other trade wastes systems into receiving waters without a consent duly granted by a Water Officer.

Section 15A (4) Empowers the Minister to make provisions regulating the procedure for making and considering applications for the grant of consent to discharge, making of objections to any such application or conditions imposed on consents granted, and any other matters related to or grants of consents to discharge.

The Act consists of two schedules. The first schedule sets standards for effluents defined in Section 2 as including "**any flowing out of fluid material discharged from domestic or industrial waste systems which by reasons of its quality, quantity or characteristics is likes to impair the beneficial use of receiving waters by adversely affecting their natural state."**

The second schedule also contains temporary standards of quality of domestic water.

Section 23 – stipulated measures to be taken if an owner of a water right does not comply with the provisions. The water officer may declare the water right to be determined.

Section 33 – makes it an offense to pollute water, stream or water course or any body of surface water to such an extent as to be likely to cause injury directly or indirectly to public health. The offense is punishable with fine not exceeding Tshs. 50,000/- or a term of imprisonment not exceeding 2 years or both. A second or subsequent conviction for that offense attracts on enhanced fine of Tshs. 100,000/- or a term of imprisonment of three years or both. A continuing offense carries an additional fine not exceeding Tshs. 500/= for every day during which the offense has continued.

Section 5 – establishes a Central Water Board (CWB)
Section 7 – provides for the establishment of Basin Water Boards. The Central Water Board has territorial jurisdiction, whilst the Basin Water Boards have jurisdiction within the area of water basin in relation to any river for which it is established under section 7 (2) of the Act

Section 6(1) - makes the central Water Board the principal advisory body of the Government in matters relating to water utilization and has functional responsibility in relation to control and regulation of water pollution. The Central Water Board also has powers to recommend to the Minister legislative measures necessary or suitable for the effective control of water pollution and to formulate effluent and receiving water standards and programmes for ensuring compliance with these standards by domestic, commercial, industrial and other uses, powers which are contained in Section 6(3) and (f)

The Central Water Board is vested with recommendatory powers in relation to water pollution control legislation but is fully empowered with authority to set effluent and receiving water standards.

The Waterworks Ordinance specifies that pollution of water supplies in certain instances are offenses under the ordinance punishable by penalty.

4.1.2 The Urban Water Supply Act No. 7 of 1981

The Urban Water Supply Act gives the National Urban Water Authority power to make rules regarding surface ground water pollution and specifies that it is an offence to pollute water supplies, in certain instances punishable by penalty.

Section 45 (1) – deals with pollution. It stipulated that "Any person who deposits or allows or causes to be deposited any earth, material or liquid in such manner or places that it may be washed, fall or be carried into the waterworks shall be guilty of an offense and shall be liable on conviction to a fine not exceeding twenty thousand shillings, and if that earth material or liquid is allowed to remain so deposited after notice in writing from the Authority requiring it to be removed has been given to that person, he shall be liable to a further fine of one hundred shillings for each day during which the offence continues."

Section 45(2) – impose a fine of shillings twenty thousand to any persons who errects or inhabits a structure whether or a permanent or temporary nature on any part of the waterworks.

Section 47 – deals with general penalties. It states that "**every breach of this Act, for which no penalty is by this Act, otherwise expressly provided shall be punishable by a fine not exceeding five hundred shillings".**

The above legislation have the following weaknesses:-

. a They do not stipulate the type of waste, whether solid or liquid which could cause pollution to water supplies.

. b They do not stipulate (apart from the temporary standards established in the scheduled to the Water Utilization and Control Act) the environment the standards to be met.

. c The Water Utilization (Control and Regulation) Act does not provide sufficient emphasis to and no penal measures are provided against the owner of a water right who fails to install or facilitate installation at a point of discharge all machinery and other facilities necessary for the taking of samples and collection and treatment of effluents. Due to this weakness, many industries along Lake Victoria basin neglect to install the required machinery.

. d The provisions regulating procedures for making and considering applications for the grant of consent to discharge provided for under Section 15A(4) of the Water Utilization Act have not been made to date.

. e The fines imposed on defaulters and offenders are too low. Law violators have no incentives to comply with the law. It is cheaper for them to pay the fines that comply with the requirements of the law.

4.1.3 Fisheries Legislation

The Fisheries Act, No. 6 1970, Fisheries (General) Regulations, 1973 as amended by the Fisheries (Explosives, Poisons and Water Pollution) Regulation 1989.

Section 7(1) of the Act empowers the Minister responsible for fisheries to make regulations for purpose of protecting, conserving, developing, regulating or controlling the capture – collecting, gathering, manufacture, storage or marketing of fish products – aquatic flora or products of aquatic flora.

Section 7(2) (0) empowers the Minister to make regulations preventing the obstruction and pollution of territorial waters. The territorial waters are defined in Section 2 of the Act to mean waters within the area extending across the sea to a distance of twelve nautical notes measured from the mean low water line along the coast of Tanganyika and the adjacent islands and includes all lakes, rivers, fish ponds and dams in Tanganyika.

The powers of the Minister to make regulations has been exercised by formulating the following regulations:-

. a The Fisheries (General) Regulations of 1973 as amended by the Fisheries (General) {Amendment} Regulations of 1973.
. b Fisheries (Explosives, Poisons and Water Pollution) Regulations of 1989
. c The Fisheries Principal Regulations of 1989.
. d The Fisheries (Inland Waters) Regulations, 1987.
. e Fisheries (Fisheries {Restriction on Trawling in Lake Victoria) Regulations of 1975.

Regulations 3 of the 1982 regulations, defines water pollution as “man-made or man induced alteration of chemical, physical, biological or radiological integrity of water.

Regulation 6 of the 1973 regulations, provides that, no person shall cause or knowingly permit to flow or pass into water any solid, liquid or gaseous matter to a concentration which shall be injurious to any aquatic flora or fauna.

Regulation 2 of the 1989 principal regulations defines pollution to mean the introduction by man directly or indirectly of substances of energy into sea water or freshwater including estuaries which results into or is likely to result in such deleterious effects as harmful to fish and other living organisms, hazard to human health, hindrance to marine activities, including fishing, impairment of quality for the use of sea or freshwater and reduction of amenities.

Regulation 26 prohibits the use of poison in any lake, river, dam, estuary or seas and makes it an offence to any person who contravenes the regulation.

Regulation 27(1) prohibits water pollution – it states that, no person shall cause or knowingly permit the flow or pass into water any solid liquid or gaseous matter or cause water pollution in any lake, river, dam, estuary or sea water.

Regulation 27(2) provides that the Director of Fisheries shall maintain and establish a system of consultation and co-operation with appropriate officials in the Ministry responsible for industries or any other person or body of persons or body of persons established by any written law for the purpose or requiring any person or body of persons who contravenes the provisions of this regulations to clean the polluted water within a reasonable period at his own expenses.

Regulation 43 imposes penalties for any person who is guilty of an offence under the regulations. In the case of a first offence, a penalty of a fine not exceeding ten thousand shillings or a term of imprisonment not exceeding two years or both such fine and imprisonment. In the case of a second or subsequent offence, a penalty of a fine not exceeding twenty thousand shillings or a term of imprisonment not exceeding five years or both such fine and imprisonment.

Regulation 44 provides for penalties to persons who contravene regulations 25, 26, 30,

31 and 40. For a first offence the fine of not less than ten thousand shillings or a term of imprisonment of not less than three years or both such fine and imprisonment. In the case of a second or subsequent offences to a penalty of a fine of not less than fifteen thousand shillings or a term of imprisonment not less than four years or both such fine and imprisonment.

The above legislation consist of the following deficiencies:-

The legislation does not specify the reasonable time within which a polluter to the waters is supposed to clean up the pollutants. This given a loop-hole to those who contravene the fisheries regulations as it is evidenced by the polluting industries along the shores of Lake Victoria.

The fines imposed on the polluters are extremely low. They are not deterrent enough to distract potential polluters.

Enforcement mechanisms are generally weak. Polluters are known, their polluting activities are done openly by the enforcement authorities rarely enforce the law.

It is doubtful whether the consultations and co-operation mechanisms provided for under regulation 27(2) of the principal regulations have ever taken place.

4.1.4 Institutions

The National Environment Management Council Act, 1983, establishes the National Environment Management Council (hereinafter called). NEMC was established to undertake some of the following functions:-

- Formulate policy on environment management
- Co-ordinate activities of all bodies concerned with environment activities
- Evaluate existing and proposed policies of the government directed at the control of pollution
- Recommend measures to ensure that government policies, including development and conservation of natural resources, take adequate account of environment effects.
- Foster cooperation between government, local authorities, and other bodies engaged in environmental programs; and
- Stimulate public and private participation in programs and activities for the rational beneficial use of natural resources.

Since its establishment in 1983, NEMC has been able to formulate a proposal for a National Conservation Strategy for Sustainable Development (NCSSD), a proposal for an Environmental Protection Bill, and it has prepared amendment proposals to the National Environment Management Act, which include provisions (in Part V) for conducting EIA's before a planned activity is approved.

In 1991, the Division of Environment was created within the Ministry of Tourism and

Natural Resources. The Division has now been moved to the Vice Presidents office.

This government division is charges with addressing environmental issues. Since its creation the division has been instrumental in organizing a number of workshops on the environment including those on implementation of Agenda 21 and has drafted a proposal for the national environment policy.

The present organizational set up however has the following constraints:

. ạ The establishment of the division of Environment did not clarify the Ministry's responsibilities vis a vis the responsibilities of other sectoral ministries and institutions for instance NEMC and other sectoral bodies. As a result, relationships between the Division and the other sectoral bodies and institutions with responsibilities which impact on the environment have not been solidified.

. ḅ Lack of cross sectoral co-ordination, unspecified responsibilities and overlapping of functions has led to failure in ensuring that natural resources and the environment are managed sustainably.

. ç There is inadequate co-ordination among central government bodies and between departments of the central government ministries.

. ḍ There is inadequate legal provision for an administrative mechanism to handle specific local matters for example catchment areas and wetlands leaving these ecosystems open for abuse.

Both NEMC and the Environment division lack sufficient personnel to carry comprehensive regulatory programs.

4.1.5 Inland Water Transport

The Inland Water Transport Ordinance, Cap. 172 is vested with powers for control, co-ordination and development of inland water transport system. The jurisdiction of the Ordinance extends to that part of Lake Victoria which lies within the boundaries of Tanganyika but its application could be extended by presidential proclamation, to other inland waters lying within the boundaries of Tanganyika. The Ordinance is the only one which deals with transport matters on the waters of Lake Victoria.

Unfortunately, the ordinance does not at all deal with water pollution in spite the potential of lake-going vessels for accidental or operational oil pollution.

4.1.6 Local Government

The Local Government (District Authorities) Act No. 7 1982 provides for the establishment of district authorities which include a district council, township authority, village council and Kitongoji. A District Council has under Section 118(1)(d) of the Act, legislative authority includes making of by-laws and consideration and approval of by-laws made by village councils within the area of jurisdiction of the district council.

Section 118(2)(a) empowers a district council to impose requirements as to sanitation of buildings, construction and maintenance of latrines and other sanitary structures. Section 118(2)(d) empowers a district council with powers of regulation and compelling

the provision, construction, use and repair of receptacle for solid and liquid refuse.

Paragraphs 37, 47, 49, 90, 91 and 95 of the first schedule to the Act deal with pollution related powers. Paragraph 37 refers to the powers to take measures for the prevention and abatement nuisance, causative annoyance, danger or injury to health.

Paragraph 47 refers to the power to establish, maintain operate and control drainage and sewerage works.

- Paragraph 49 refers to powers to remove all kind of refuse.

- Paragraphs 90 and 91 are particular and direct relevance to water pollution. They provide for powers to establish, provide, maintain and control public waters supplies and prevent pollution of water in any river, stream, water course, well or other water supply and for this purpose to impose. Prohibit, regulate or control the use of such water supply.

Paragraphs 95 is of importance to conservation of wetlands, it provides for powers to regulate or control the use of swamps or marshlands.

Section 132(1) to the Act specifies the powers and duties of the township authorities. The township authorities share all the powers and functions of district councils stipulated above in relation to areas within their jurisdiction.

Paragraph 43 of the second schedule empowers township authorities to take and require the taking of measures for the conservation and prevention of pollution of water supplies.

The Local Government (Urban Authorities) Act, 1982 provides for the establishment or urban authorities which are defined as town councils, municipal councils or city councils as the case may be. Section 55 of this Act and the schedule thereto are almost verbatim, to the powers and functions given to the district councils and townships authorities in the domain of water pollution and conservation of natural resources generally.

The above statues are weak for lack of enforcement of their provisions. Lack of facilities such as refuse collection, trucks, breakdown of pumping stations as in the case of Mwanza Municipality, illegal connections of septic tanks and pit latrines directly into water systems such as the Mirongo River in the case of Mwanza Municipality have all contributed to water pollution of water bodies.

There is obvious lack of implementation of the provision of the legislation in almost every area in the country.

4.1.7 Public Health

The Public Health (Sewerage and Drainage) Ordinance, Cap. 336 is the relevant legislation. The legislation makes provisions for the preservation of public health, through sewerage, drainage and sanitation in the country.

Section 4 – confers a duty to the municipal and town councils together with the township authorities to construct and maintain public sewers and sewage disposal works.

Section 9 – provides a right to the public to drain into public sewers. A provision to

section 9 prohibits to discharge directly into public sewers:-

. i Any water from a manufacturing process or factory other than domestic sewage or storm water except by agreement with a local government authority.

Any matter the discharge of which into public sewers is prohibited under the Ordinance or any written law.

The discharge of industrial effluents into public sewers is restricted, discharge is only possible where there is an agreement between the industry/factory and the relevant local government authority. Discharge of industrial effluents without such an agreement is subject to penal sanction provided for under section 30 of the ordinance.

This Ordinance has the following weaknesses:

. i It does not specify what measures, and who should take the measures against municipal and town council and the township authorities when they fail to construction and maintain public sewers and sewage disposal works as provided for in the legislation.

. ii The Ordinance does not provide standards for the waste waters to be discharged through the sewers.

. iii The penal sanctions stipulated in the ordinance against defaulters, are not deterrent enough.

. iv Enforcement mechanisms are weak as evidence by discharges of industrial effluents by various industries along the Lake Victoria basin.

. v Local authorities depend on budget allocations from the central government, the funds they raise through taxes and fines are insufficient to cover their operational costs. Secondly the present accounting system requires the local authorities to remit whatever they collect to the treasury.

Thereafter the treasury re-allocates the funds to the local governments and the central government according to the urgency of certain needs. In most instances, the funds are usually allocated for other uses other than the construction and maintenance of public sewers and sewage disposal works.

4.1.8 Pestices

Pesticides are regulated by the Pesticide Regulations, No. 1993 of 1984 and Rules 297/85. The regulations are made pursuant to section 41 of the Tropical Pesticides Research Institute Act, No. 18 1979.

Regulation 3 – stipulates the objectives of the regulations as follows:

To ensure the effectiveness of pesticides used in Tanzania, mainly for the protection of public health and safety.

To protect against possible harmful effects of pesticides including among other things, damage to the natural environment including impairment of health of wildlife and

contamination of waterways, lakes and other water bodies.

Regulations 27 (i) and (ii) require registered manufacturers, importers, sellers or handlers of pesticides to supply information on the safest and most practical way or ways of disposing any unwanted quantities of pesticides and any used pesticide contained with the least possibility of polluting the environment.

There is evidence that there regulations are being contravened. As a result, pesticides are being imported, handled, used and disposed off haphazardly. This has subsequently led to pollution of water bodies through run offs and land degradation.

Pesticides such as thiodan are commonly used for killing fish in the lake regions. Cases of thiodan use for fishing have been reported at Igundu area and Mara river in Bunda District (LVEMP, 1995 Group II)

4.1.9 Solid Waste Management

There is no single legislative instrument which specifically deals with solid waste management. As a result solid waste is dumped on urban and rural areas haphazardly, due to insufficient disposal sites, weak local government enforcement capacity, and inadequate collection mechanisms. Some legislation, for instance the Local Government Authorities Act, the National Land Use Planning Act, and the Town and Country Planning Ordinance in some way deal with wastes. But they do not provide for local dumping sites to be where the least environmental and health impacts will occur. Maintenance of standards at the disposal sites do not protect the public from public nuisance such as odor and smoke resulting from burning waste. Environmentally sound disposal methods such as sanitary landfills, composting or incineration are nor practiced or required.

Solid Waste management in Mwanza, Musoma and Bukoba municipalities is unsatisfactory. The municipal councils are unable to collect the generated waste. Uncollected waste is crudely dumped in open spaces, storm water drains, valleys and in streams traversing the human settlements. Refuse collection services are concentrated in the central business areas such as markets. The rest of the towns remain unattended too.

During the rainy seasons – the uncollected refuse is transported by surface run off to the water courses which finally enter the lake.

4.1.10 Land use

All land in Tanzania is public land and under the control of the state. Land rights and titles are governed by use and occupation. Much of the land in the rural areas i8s owned under customary land tenure while in urban areas there are statutory rights of occupancy for a specific period of time. Currently, public land can be leased to villages, which in turn can lease it to individuals. This has resulted in insecurity in tenure. No new laws have been enacted to structure village demarcation and titling, resulting into conflicts between customary law and statutory titles (NCSSD, 1992).

Several pieces of legislation deal with land use planning and management, they include:

The Land Ordiance, Cap 113, The Town and Country Planning Ordinance, Cap. 378, The National Resources Ordinance, Cap 259, The National Land Use Planning Act. 3 of 1984, The Land Acquisition Act, No. 47 of 1967, and the Regulation of Land Tenure Act.

Local authorities are given various powers under the Local (District and Urban) Authorities Act of 1982 to establish by-laws with regard to the protection of soil, agriculture, water supplies and other natural resources.

Numerous pieces of legislation were enacted in an attempt to control land use. However, there is no law which calls for sustainable land utilization and no penalties are available for misuse and degradation, resulting from for instance the excessive use of fertilizers.

Environmental restoration and reclamation after use is not a legal requirement. Co-ordination between the different authorities, ministries and local governments is only thinly provided for, resulting in conflict of interest and responsibilities.

The existing land legislation and the institutional set up for land tenure are inadequate to enhance review and decision. The resulting institutional structures and relationships will form the development of comprehensive framework legislation which is scheduled to take place this year. The framework environmental legislation will be designed to organize various agencies of Government charged with aspects of environmental management and protection to promote coordination and cooperation among them.

4.2. National Commitments to relevant International Agreements

Tanzania is a party to international and regional conventions and agreements relevant to environment and natural resources conservation and management. Such agreements include the Lusaka Agreement on Trade in Wild fauna and flora; international conventions including climate change, desertification, migratory species; world heritage, ozone layer protection and biodiversity. Status of ratification of the conventions and agreements as indicated below.

. i The UN law of the Sea Convention, adopted in 1958, ratified by Tanzania on 30 September, 1985.

. ii The Basal Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, adopted in 1989; Acceded by Tanzania on 7th April, 1993.

. iii Montreal Protocol on Substances that deplete the Ozone Layer, adopted in 1987; acceded to by Tanzania on 16th April 1993 (including the London amendment of 1990 to the protocol).

. iv The United Nations Framework Convention on Climate change, adopted in May 1992; signed by Tanzania on 12th June 1992, ratified by Tanzania on 1st March 1996.

. v The United Nations Convention on Conservation of Biological Diversity, signed by Tanzania on 12 June 1992, ratified by Tanzania on 1st March 1996.

. vi The United Nations Convention to Combat Desertification in those countries Experiencing Serious Drought and/or signed by Tanzania in September, 1994,

ratified by Tanzania in April 1997.

. viị The Convention on International Trade in Endangered Species on Wild Fauna and Flora, adopted in 1973, ratified by Tanzania on 29 November 1979.

. viiị Convention on the conservation of migratory species of Wild animals adopted in 1979, acceded to by Tanzania on 23 April 1999.

. ix The Bamako Convention on the Ban of Import into Africa and the Control of Transboundary movement and management of Hazardous Wastes within Africa, adopted in 1991; ratified by Tanzania on 7 April, 1993.

. x Lusaka Agreement on Co-operative Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora, ratified by Tanzania on 8th September 1994.

. xị Convention for the Protection Management and Development of the Marine and Coastal Environment of the Eastern African Region and related protocols, adopted in 1985, acceded to by Tanzania on March, 1996.

Law, Ordinance Regulation	Year (in force)	Government Agency Concerned
Fisheries Regulation	1975 & 1981	Ministry of Natural Resources and Tourism
Fisheries inland Water Regulation	1982	-'-
Wildlife Conservation Act	-	
The Town and Country Planning Ordinance Cap. 378 1966	1966	Ministry of Lands and Human Settlement
The National Land Use Planning Commission Act No. 3, 1984	1984	Ministry of Lands and Human Settlement
Local (District) Authorities Act No. 7 of 1982	1982	Ministry of Local Government
The Rural Land (Planning and Utilization)Act No. 14, 1973	1973	Ministry of Lands and Human Settlement
The Range land Development and Management Act No. 51, 1964	1964	Ministry of Agriculture and Cooperatives
Cattle Grazing Ordinance Cap. 155		Ministry of Agriculture and Cooperatives
Land Acquisition Act No. 47 of 1967	1967	Ministry of Lands and Human Settlement
Plant Protection Ordinance Cap 133, Supp. 60		Ministry of Agriculture and Cooperatives
National Parks Ordinance Cap. 412, Supp. 59		Ministry of Natural Resources and Tourism
Wildlife Conservation Act No. 12 of 1974	1974	Ministry of National Resources and Tourism
The Fisheries Act No. 6 of 1970		Ministry of National Resources and Tourism
Protected Places and Areas Act No. 38 of 1969	1970	Ministry of National Resources and Tourism
Public Lands (Preserved Areas Ordinance)	1969	
Mining Act No. 17 of 1979		Ministry of Energy and Minerals
Petroleum Exploration and Protection Act No. 66, 1988	1979	Ministry of Energy and Minerals
Water Utilization and Control and Regulation Act No. 42,1974	1988	Ministry of Health
Public Health Sewerage and Drainage Ordinance Cap. 336	1974	
National Investment Promotion and Protection Act No. 10, 1992	1992	Ministry of Natural Resources and Tourism
Land Ordinance Cap 113		Ministry of Lands and Human Settlement
Tanzania Fisheries Research Institute Act No,. 6, 1980	1980	Ministry of Natural Resources and Tourism
College of African Wildlife Management Act No. 39, 1974	1974	Ministry of Natural Resources and Tourism
Serengeti Wildlife Research Institute Act No. 4, 1980	1980	Ministry of Natural Resources and Tourism
Tanzania Forestry Research Institute Act No. 5, 1980	1980	Tanzania Forestry Research Institute
Tropical Pesticides Research Institute Act No. 18, 1979	1979	Tropical Pesticides Research Institute
Commission for Science and Technology Act No. 7, 1986	1986	Commission for Science and Technology
National Environment Management Act No. 19, 1983	1986	National Environment Management Council

Table 4.1: National Laws and Regulations related to coastal and marine environment

5.0 ENVIRONMENTAL MANAGEMENT

Realizing the need to manage the environment the government enacted the National Environment Act in 1983, after which the National Environment Management Council was created that same year. The National Environment Policy was prepared followed by the Environment Action Plan in 1994.

The National Environmental Policy ensures that development activities, such as mining, agriculture, industrialization and many more are carried out in such a way that they do not degrade the environment or risking health or safety. In order to achieve the major object in appropriate action is being taken to control degradation of the land, water, vegetation; conservation and enhancing man made heritage, including the biological biodiversity of the unique ecosystem in the basin. Steps are taken to public awareness and understanding of essential linkages between the environment and development in order to promote individual and community participation in environment conservation in the basin.

The country has ratified convention on Biodiversity and on Combating Desertification. National Biodiversity Action Plan (1999) as well ad National Forestry Action Plans (1989) have been prepared. The documents are supplements to the National Environment Action Plan which was prepared and lunched in 1994. Apart from these Action Plans, lead Ministries responsible for Environment, Agriculture, Livestock Water, Mining, Energy, Wildlife, Tourism Fisheries, Forestry, whose activities have impact on the environment have all policies and guide them. The policies include monitoring environmental degradation and needed conservation measures. The Ministries have also legislations which, among others protect degradation of the environment.

The existence of the Lake Victoria basin natural resources is threatened by many activities. The threats include deforestion, soil erosion, wetland degradation, mining, water pollution, entrophications, water weeds infestation, siltation, sewage discharge, floods and drought and oil spills. A start on redressing the environmental degradation has been made. Tanzania is actively co-operating with Kenya and Uganda on implementing the Lake Victoria Environment Management project, which has components on water quality and ecosystems management, water hyacinth control, fisheries afforestation, wetlands management component and water soil and conservation

Various efforts have been taken by the government at the central, regional and district levels to redness environmental degradation in the basin and in the country as a whole. The efforts are continuing and some of them need to be supplemented by programmes with external support financially.

Land degradation in the basin, has been identified as a major problem in the basin. Efforts are made to promote an integrated approach to the planning and management of the land resources in order to optimize use and sustainable management of the resources. The exercise involves strengthening of land tenure, legislation, land allocation procedures and the powers and procedures of the land allocation authorities. Institutional mechanisms are strengthened to facilitate local involvement and participation on land issues. Soil conservation measures are also been taken as set out in the national soil and Water conservation programme. Concepts of range management in the communal sector are being reassessed.

Provision of adequate water supply of good quality which is readily available to the people in the basin has been a top priority to the people in the basin and in the country as a whole. Unfortunately this target is yet to be achieved although efforts started as later as 1970 when the 20 year water supply programme was declared. To- date the water supply coverage is between 40 and 50% for rural and 80% for urban areas in the basin. Controlling water pollution, the Water Utilization (Control and Regulation) Act of 1974 and its Amendment Act of March 1981 is the main legislation, also use is being made of the National Water Policy which emphasizes on regular water quality monitoring of water bodies as well as monitoring industrial effluent quality from the various industries in the basin. Legislation requires EIA's to be carried out for every major development project being undertaken. Public awareness on water pollution control is raised by holding meetings, seminars and workshops for urban pollution, environmental guidelines are being developed. They are intended to cover urban pollution.

Conserving water resources, protecting aquatic and wetland ecosystems and the sustainable production of fish are important to the health and well being of the people in the basin. Steps being taken to redress the deterioration of aquatic resources in the basin include enforcement of environmental legislations which prohibit actions which deteriorate the aquatic resources. These include carrying out of EIA studies on major projects, establishing criteria for granting "planning consent" in ecologically sensitive areas especially wetlands as established under the town and country planning ordinance and encouraging environmentally sound human activities in the basin.

Many aspects of development pose a threat to the future existence of particular species and even ecosystems in the basin. The wildlife resources are important scientifically, economically and culturally. In order to control loss of wildlife habitats and biodiversity apart from the confirmation of the well established national system of parks and game reserve steps are taken to increase people awareness of the importance of wildlife and biodiversity. This is mostly done at the local level where the impact of conservation practices is most felt.

Deforestation is not only a problem of resource loss but a contributor to problems of land degradation, lack of water availability and loss of biodiversity. The sustainable use of forest resources is an important national goal. Efforts are being made for public and reserved areas to have proper management plans based on principles of multiple use. The major threats to forests in the basin is due to lack of enough trees for building materials and wood fuel, also medicinal purposes. Overgrazing and bush fires are also major problem. What is done to conserve the forest is enforcement of relevant legislation and raising people's awareness on conservation of the forests and most important of all is the execution of afforestation programmes. Also there are efforts to provide to the people charcoal stoves which use small quantities of charcoal as a source of energy for cooking purposes. Preliminary plans are also underway to develop hydropower stations at Rusumo falls and in Mara rivers. Dissemination of electricity to villages and having affordable tariffs will no doubt have an impact on the rate of deforestation in the basin.

5.1 Protected Areas of Tanzania

Tanzania like most countries has a hierarchy of Protected Areas (PAs). For example, under its present wildlife legilation, Tanzania has five categories of PAs: National Parks (NPs), Game Reserves (GRs), the Ngorongoro Conservation Area (NCA), Game Controlled Area (GCAs) and Partial Game Reserves. Thus as of 1996, there are 12 NPs, 23 GRs, Ngorongoro Conservation Area (NCA) and 44 GCAs making a total of 240,000

Km^2 (MTNRE, 1995). The NPs are meant for tourism/site seeing, photography, camping and research, while the GRs cater for licensed hunting, tourism and research. The NCA is a multiple land use are whereby human activities are integrated with wildlife protection: thus pastoralism, tourism and wildlife protection are taking place simultaneously. The GCAs act as buffer zones for the PAs and also are inhabited by people, cater for tourism, licensed hunting and research.

In addition to wildlife protected areas, there are 540 Forest Reserves (FRs) covering 132,000 Km^2 which is equivalent to 15% of the total woodland forest area of Tanzania estimated at 440,000 Km^2. Part of the reserved area is categorized as productive area (108,000 Km^2) where harvesting is allowed and the rest is categorized as protected area (260,000Km^2) where harvesting is not allowed.

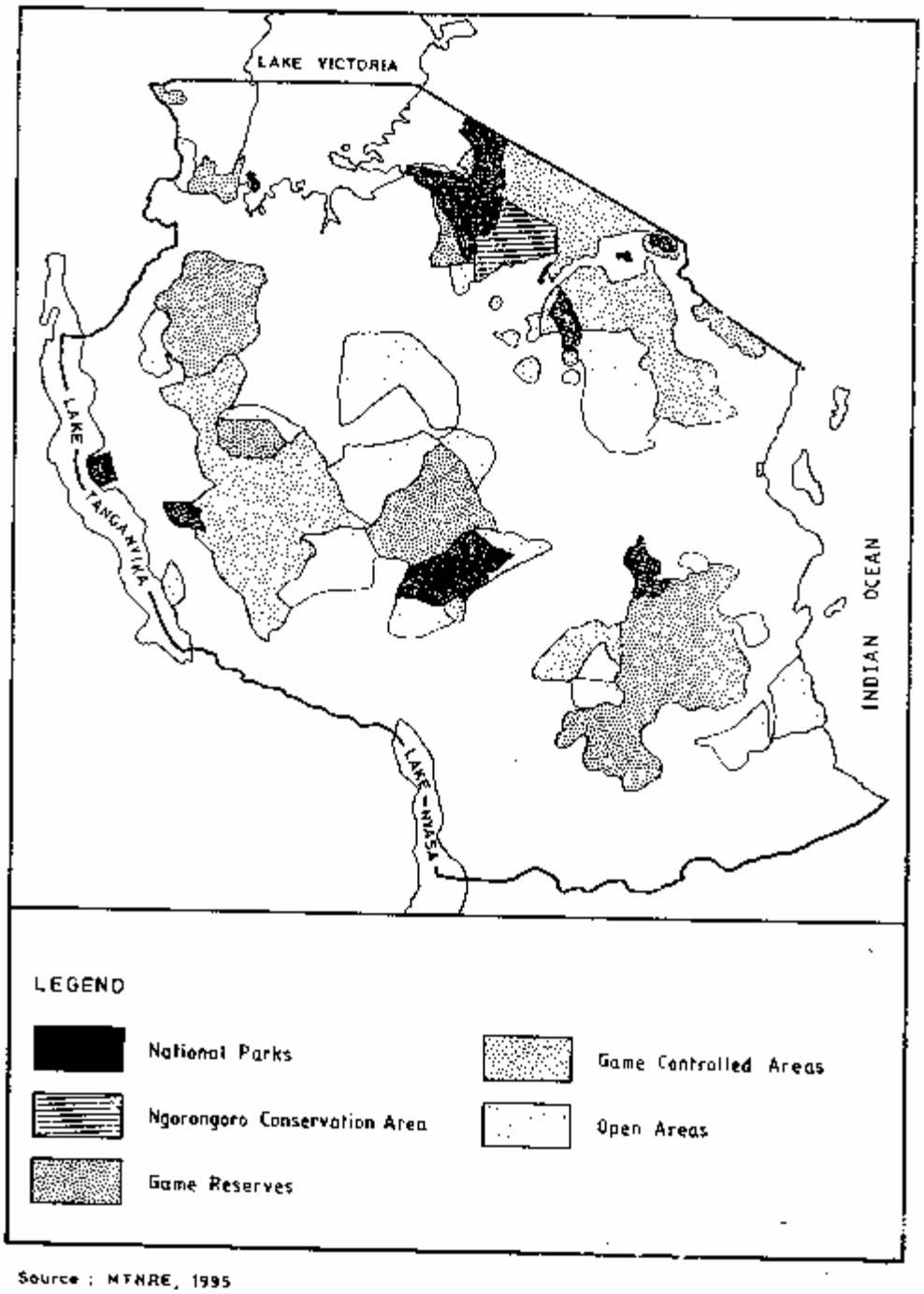
Also there is the Mafia island Marine Park established under the Marine Reserve Act No. 29 of 1994. Marine resources around Mafia Island are considered to be among the richest on the East African coast. The area near the south-east corner of Mafia has in particular been recognized as a critical site for biodiversity. Table 5.1 summarized protected areas in Tanzania.

Wildlife PAs constitute a significant proportion of the Acacia – Savanna and grassland zone as well as the *Brachystegia-Julbernadia* Savanna Woodlands. Some of these areas, especially Shinyanga and some part of Arusha, have high human population densities so much that land availability is a problem. National Parks,. Game Reserves and Forest Reserves exclude human settlement within them, and this has resulted into major landuse conflicts.

The Ministry of Natural Resources and Tourism is the principal government body charged with the responsibility of protecting, the national parks, game reserves, game controlled areas, partial game reserves and the forest reserves.

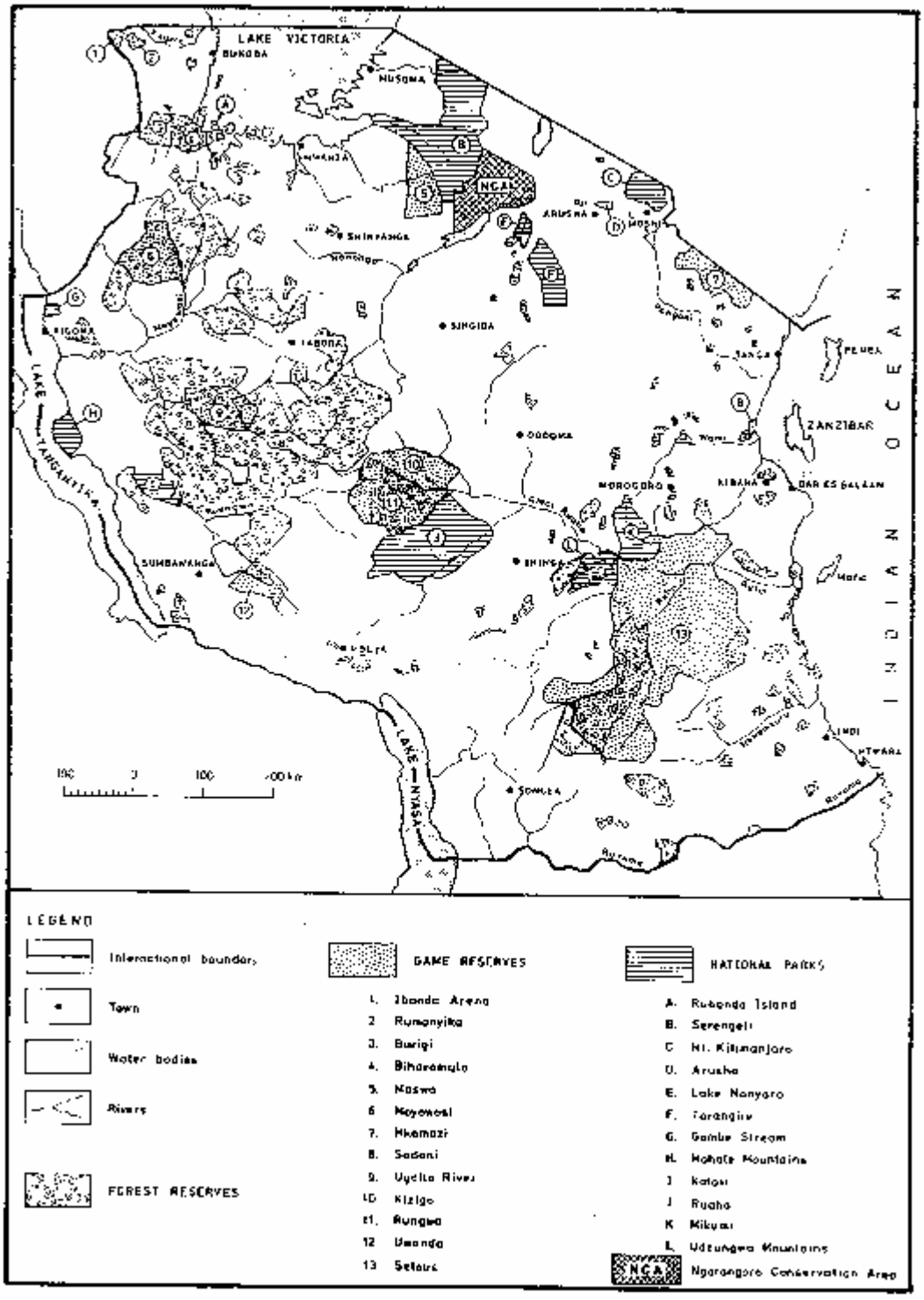
In the Tanzanian side of Lake Victoria basin there are a number of game reserves, game controlled areas, forest reserves and a national park. Game reserves of importance include Gurmeti, (2,973 Km^2), Bugiri (2,200 Km^2), Rumanyika Orugundu (800 Km^2), Masasi River Game Controlled areas (80Km^2) Rubondo Island (456 Km^2) and Chabula Mersh (100Km^2). There is also the famous Serengeti National Park. Among these protected areas Serengeti National Park, Minziro Forest reserve, Ibanda Game Reserve and Rumanyika Game Reserve are crossborder protected areas.

Map 2.0 WILDLIFE PROTECTED AREAS OF TANZANIA



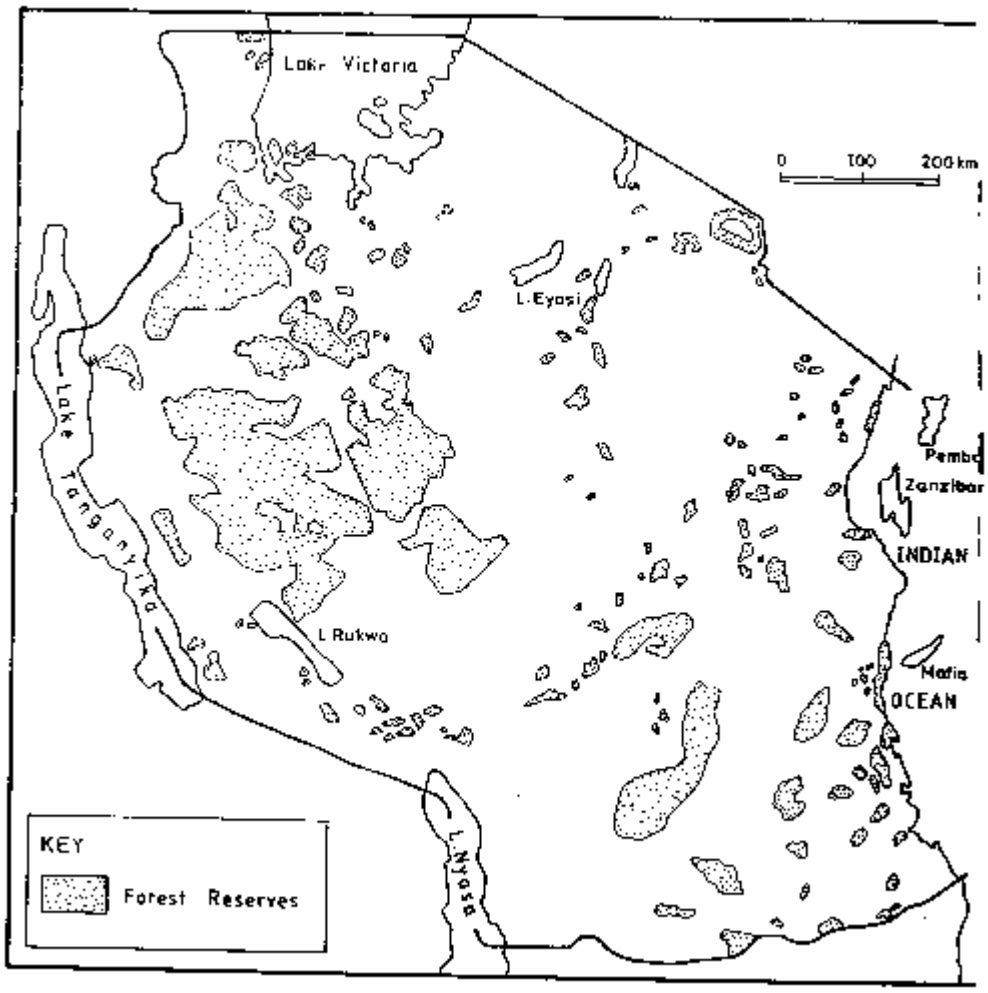
Source : MTNRE, 1995

: Map 3.0 TANZANIA PROTECTED AREAS



Source : NEMC Database Unit, 1995

MAP 4.0 :TRIBUTION OF FOREST RESERVES IN TANZANIA



Source : FAO, 1990

SIGNIFICANT CROSSBORDER PROTECTED AREAS IN THE BASIN

PROTECTED AREA	SIZE/ YEAR KM^2	SITE DESCRIPTION AND REGIONAL SIGNIFICANCE	IMPACTS AND CONFLICTS	CURRENT MANAGEMENT ARRANGEMENT
1.Serengeti National Park	14,763	Serengeti National Park shares border with Tanzania and Kenya. The park is dominated by wildlife species such as hippopotamus, waterbuck, warthog, elephant, crocodile, statunga, waterbirds such as flamingos, and ducks etc. Serengeti is in Mara region and it is watershed for part of Lake Victoria.	- Poaching (illegal hunting)	Protected area
2. Minziro Forest Reserve	265	Minziro forest reserve share borders with Tanzania and Uganda. It is a semi-swamp forest covering 265 Km^2 . The forest has a variety of species usually found to the northwest or rarely found in other parts of Tanzania such as *Heywoodia Lucensi, Podocarpus, Usambarensis var dawei, Mussaenda erythrophylla, Gassipourea ruwensorensis, citropsis articulata, manilkara dovata, Baikiaea insighis and Uncaria africana)*	~ Cutting of trees by local people for building materials, medicine ~ Over harvest of tree timber species, fire, charcoal burning	Protected area
3. Ibanda Game reserve	200	Ibanda Game Reserve share borders with Tanzania, Uganda and Rwanda	Poaching and illegal harvesting of timber, uncontrolled fire	Protected area.
4. Rumanyika Game Reserve	800	Rumanyika Game Reserve area borders Tanzania and Rwanda. It is within Kagera watershed	Poaching, illegal harvesting of timber, uncontrolled fire	Protected area

Table 5.1 Significant crossborder protected areas in the basin

õ ENVIRONMENTAL ISSUES IN THE LAKE VICTORIA BASIN (THREATS TO WATER RESOURCES)

The lake basin has one of the highest population growth rates in East Africa. Multiple activities resulting from this population are often conflicting i.e intensive agriculture, deforestation, overgrazing, wildfire, invasion of wetlands, over fishing, urbanisation and development of squatter areas.

These trends, coupled with wide spread poverty in the lake basin have rendered the lake environmentally unstable. The last three decades have witnessed alarming ecological changes. Massive blooms of algae have developed often dominated by the toxic blue-green algae. Transparency index of the lake water has declined and the frequency of water-borne diseases has increased. Water hyacinth, absent as late as 1989, has now spread over, an area of 2,000 hectares choking important water ways and fish landings. Over fishing and depletion of oxygen at lower depths of the lake threaten artisanal fisheries and biodiversity. Over 200 indigenous species are believed to be facing possible extinction. The root causes of many of these extensive changes are believed to be the introduction of the Nile perch as an exotic species about 30 years ago. This has altered the natural food web, as well as increasing nutrient load into the lake from adjoining catchment due to land degradation and inadequate management of municipal and industrial wastes.

The Lake Victoria basin is used as source of food, energy, drinking and irrigation water, shelter, transport and as a repository for human agricultural and industrial wastes. The various activities being undertaken in the basin have resulted in rendering the lake waters environmentally degraded. The ecosystem has undergone substantial changes

within the past three decades. Algae blooms have developed and have increasingly been dominated by the potentially toxic blue algae variety. The lake water continues to loose its transparency. The transparency index has declined from 5 meters in the 1930's, to less than a meter at present. Over-fishing and oxygen depletion at lower depths of the lake threaten the biodiversity. It is believed that over 200 indigenous species face possible extinction.

The water resources environment in Lake Victoria Basin is threatened by many issues which can be grouped as land degradation, water quality degradation, urban, rural and industrial environmental problems finally and poor planning in lake shores and river banks: other threats include navigative risks, oil spills, floods and droughts, refugee problems and impacts of climate changes.

6.1 Land Degradation

The direct causes of land degradation have a clear and visible bearing on the vegetation and soil in the basin, these include overgrazing, poor crop cultivation practices removal of vegetation cover, bush fires and natural causes.

Overgrazing, resulting from large numbers of livestock in grazing lands, degrades vegetation cover and exposes soil to wind and water erosion. Soil compaction, especially on livestock routes, also occurs and thus exacerbating land degradation. In the Lake Victoria Basin, many areas of the land have been severaly degraded due to overgrazing. Hot spots include Kwimba, Magu, Geita, Mwanza and Sengerema districts of Mwanza region and Musoma, Bunda, Tarime and Serengeti district in Mara region. In these districts, areas for grazing are restricted due to high population densities, agricultural activities, expansion of settlements and the large stocks of livestock being kept.

Forest degradation has resulted in soil erosion which severely degrades the water resources in the basin.

In Kagera region whose area in 28,388 Km2 with a total forest area of 14,618.06 some 600 (Ha) of land are under severe encroachment while 1,000 hectares being under moderate encroachment.

Likewise for Mara region large parts of the forests are encroached for woodfuel, building materials and construction materials for furniture.

Most of the Mara region is mainly covered with woodlands and there are no substantial natural forests and government forest plantations. The woodlands are heavily exploited by the people. The forests and woodland have proved to be one of humanity, most valuable resources and in consequence one of the most heavily exploited. Cutting down of trees has resulted in forests shrinking and their capacity to satisfy human needs diminished. The government and private sector have made efforts to avoid further depletion of forests and woodlands by preserving some of them. About 597,110 Ha of forests have been preserved in the Mara region by 1998. The government has also initiated afforestation programmes.

6.2 Land use practices

The present farming systems are increasingly susceptible to land degradation, soil

degradation e.g. reduced soil fertility and water holding capacity, in combination with change of the local climate are manifestors leading to a loss of land productivity in the basin especially Mwanza and Mara regions.

Farming malpractices cause loss of top soil through erosion and in addition, the nutrients utilized by crops are not replenished leading to a decline in soil productivity. Furthermore poor landuse management practices coupled with traditional landuse practices and huge livestock concentrations in the Lake Victoria Basin results in soil erosion. In Mwanza and Mara regions, the number of livestock units “exceeds the land carrying capacities”. Bushfires when peasants prepare their fields ready for planting and when villagers burn old grass in order for new grass to grow after the rains for their livestock, is one of the major causes of soil erosion in Lake Victoria basin and the country as a whole. Nationally it is estimated that a total of 65,000 Ha of forests and bushlands are burned annually.

The adjacent region of Shinyanga to Mwanza region is severely affected by soil erosion. It is estimated that 3-5mm of the soil surface is annually being stripped off by wind and water erosion in some areas. As a result of the land degradation the hydrological conditions in the affected areas are changing. Permanent streams become seasonal, dams are rapidly filled up by silt, lower areas like the mouth of River Simiyu are being flooded more frequently and most areas in the basin (Mwanza and Mara region) the groundwater potential is getting lower in the semiarid areas and the upper parts of the catchment areas. The trend indicates increasing land degradation which is mostly a result of conflict in land use..

Deforestation which is prevalent in the while basin destroys the woody vegetation, trees or shrubs, it is as a result of uncontrolled cutting of wood for fuelwood, for cooking, clearing of cultivating farms, sale, drying fish, tobacco curing, burning bricks, buildings poles, medicines. With the coming of more than 0.7 million refugees from Burundi and Rwanda to Kagera region, a large part of the forests and woods in that region were removed. Other factors contributing to deforestation include cutting of branches of trees to provide fodder to livestock and in some areas trees are cleared to control tsetse flies. Due to the increase in people in the basin there has been encroachment of forest reserves (Table 6.1).

Farmers usually use fire as a tool to clean their farms after harvesting. Sometimes the fire gets out of land and commence a big fire which destroys grass cover, forests and drives away wild animals and birds.

Poverty in the basin has been recognized as both the cause and effect of land degradation. While land degradation leads to widespread poverty, poor people tend to cover exploit natural resources found in their surroundings to satisfy their basic needs. As often they forced with a problem of food insecurity. It has been estimated (Mbonde, 1998) that 50% of the people in the rural areas live below the poverty line this situation makes them to lay their hands on any thing like harvesting of trees for various purposes without even having a license to harvest them and other activities which destroy natural resources.

The rapid population growth in the basin concentrates people in small areas where that small land has to meet their basic needs. Increased population increase demand and once these demand exceeds the sustainable yield of natural systems, the resource itself begins to shrink. This situation has aggravated land degradation which reduces the

resource base from which to get future food production as well destroying natural resources. As result of the high population poaching is on the increase in the game reserves in basin.

District	Name of Forest Reserve	Owner	Area (Ha)	Illegal Harvesting Level	Encroached area (Ha)
Magu	Sayake	Local Government	5,421	Severe	120
Mwanza (Rural)	NIL	NIL	0	NIL	NIL
Geita	Geita	C. Government	47,700	Moderate	0
	Mienge	Local Government	9,100	Small	0
	Ruamugasa	C. Government	15,600	Severe	0
	Ruande	C. Government	15,500	Severe	7,750
	Sinde hill	C. Government	200	Severe	0
	Usindakwe	C. Government	400	Severe	320
	Sub-total		**88,500**		**8,070**
Sengerema	Buhindi	C. Government	12,690	Small	0
	Kome/Chigwa	C. Government	1,800	Small	3
	Kome/Ito	C. Government	100	Small	0
	Kome/Ikuru	C. Government	200	Small	0
	Mnisoma		12,190	Small	0
	Sima	L. Government	1,820	Small	2
	Sub-total		**28,800**	**Small**	**5**
Ukerewe	Itira	L. Government	107	Severe	21
	Kabingo	L. Government	250	Severe	25
	Mkigagi	L. Government	116	Severe	0
	Negoma	L.Government	697	Severe	0
	Kubya	C. Government	1820	Small	0
	Sub-total		**2,990**		**46**
Kwimba	Bujingwa	Local Government	25	Severe	25
	Ibindo	Local Government	24	Severe	24
	Ilongafipa	Local Government	1336	Severe	668
	Kakora	Local Government	4	Severe	4
	Sub total		**1390**		**721**
Misungwi	Malenga	Local Government	22	Severe	22
	Mamani	Local Government	758	Severe	493
	Mhalo	Local Government	915	Severe	686
	Mwamakelemo	Local Government	50	Severe	30
	Mwanayombo	Local Government	5	Severe	5
	Sisy	Local Government	927	Severe	464
	Talaga	Local Government	43	Severe	43
	Sub-total	Local Government	4,109		2,464
	Grand total		**129,820**		**10,705**

Source: Forest Management Project Report in 1996 Mwanza region:
Table 6.1: State of Deforestation in Mwanza Region 1997

Land degradation in the basin (Table 6.2) has resulted in soil erosion, siltation flooding and drought in many parts of the basin and has also affected climatic changes.

Region	District	Division	Core Problem	Needed Corrective Programme
1	2	3	4	5
Mara	Musoma Rural Bunda Tarime Serengeti	Majita Issenge Kowak	• Overgrazing • Soil erosion • Bushfires • Deforestation • Shifting cultivation	Livestock development Soil Conservation Education, Awareness and Law enforcement Afforestation and Reforestation Agricultural development
Kagera			• Soil erosion • Deforestation	• Soil conservation • Soil conservation and reforestation
Mwanza	Kasimba Magu Geita Mwanza (Rural) Sengerema	Mwama-Shimba Ibinda Buhinza Kabila Kisesa Sengerema Geita Misungwi Buswelu	• Overgrazing • Soil erosion • Deforestation • Bushfires • Bad farming practices	• Livestock development • Soil conservation • Conservation and Reforestation • Education, awareness and law enforcement • Agricultural development

Table 6.2 Land degraded areas in the basin

The present trend is indicating increasing land degradation which mainly is a result of conflict in land use.

6.3 Wetland Degradation

The wetlands in the Lake Victoria Basin fall into the category of the *Inland Wetland System* of Tanzania which includes the Rift valley lakes; Natron, Eyasi, Manyara, Rukwa, Tanganyika, Ngara and Belayido. Some contain depressions swamps such as Wambere and Bahi; the category includes Lake Victoria.

Lake Victoria which harbors a variety of fish species and the introduction of the Nile perch has led to the disappearing of several indigenous species in the Lake. Bad fishing methods have, contributed to the loss of biodiversity in the lake. As stated earlier, the invasion of water hyacinth in Lake Victoria has had a negative impact on biodivesity and water quality. The habit of some fishermen to catch fish at the river mouth has considerably affected the populations of certain species such a Labeo spp. The biodiversity of wetlands close to the big towns of Mwanza, Musoma and Bukoba in Lake Victoria is threatened by pollution from industrial and domestic wastes as well as farm land agrochemicals. It is estimated that land based activities (e.g. agriculture industries, mining and settlement) contribute between 65% and 80% of aquatic pollution and pose a major threat to biodiversity.

Apart from Lake Victoria the Inland Wetland system in the basin includes also *rivers and inland flood plains* which drain hinterland basin and terminate into Lake Victoria. The most important rivers in the basin are Kagera river, Simiyu river, and Mara river. They all drain into Lake Victoria. Important significant crossborder wetlands are Lake Victoria, Kager river and Mara river.

Some important plants are confined to flood plains such as *Trichlea ematica* common in ground water forests, *Khaya spp*. are important timber trees commonly found in the

plains. Minziro forest a semi swamp in Kagera region has a variety of plant species such as *podocarpus usambariensis, citropis articulate and Barkice insignis. Podocarpus usambariensis* is commonly exploited.

Rivers support important activities including fish and navigation (Kagera river), provision of water for domestic purposes, irrigation and livestock use. Some important riverine fish in Tanzania include *shilbe mystus, bulterfish, labea victorianns, barbus altianalis radcliffi and alestes jacksonn:* Some flood plains are inhabitted by a variety of wildlife such as crocodile, hippopotamus, elephant, antelopes and bufallo.

SIGNIFICANT WETLANDS (CROSS BORDER ONES) IN THE BASIN

Country Significant Wetlands	Size Km2			Current Management Arrangements
1	2	3	4	5
Lake Victoria	-	The lake borders with Tanzania, Kenya and Uganda. The lake is major source of fresh water (52.4%). The area is dominated by freshwater marshes commonly known as cyperus papyrus, cattail (typha spp.) and reed (phragmites with standing water most of the year	Land use i.e. cutting of aquatic and other vegetation. ▪ pastoralism ▪ agriculture and fishing ▪ Pollution ▪ Growth of water hyacinth	Largely unprotected. The protected part is undertaken by the current ongoing Lake Victoria Environment Management Project
Kagera River	350	Kagera River swamps and flood plains border with Tanzania, Uganda, Rwanda and Burundi. Kagera river drain into Lake Victoria. The river is important for fish and bird nesting. Kagera swamps produce a significant proportion of country's sugar.	▪ much siltation ▪ poaching of wildlife ▪ land use i.e. agriculture and grazing ▪ reduction of waterlilies	Partly protected as controlled area. There is a need for inter regard planning and use.
Mara River	30,000	The river share borders with Tanzania and Kenya. It drains into Lake Victoria. The area is dominated by freshwater marshes	▪ Cutting aquatic and other vegetation for fuel, housing, commercial activities etc. ▪ Illegal and improper fishing practices ▪ Pollution ▪ Poaching of wildlife	Unprotected

Table 6.3 Significant wetlands (Crossborder over) in the basin

6.4 Artificial Wetlands

Artificial wetlands are manmade lakes and ponds. In the lake basin a number of dams have been constructed in Mara and Mwanza region.

Reservoirs which include those which have been made by man basically control and hold water. The control and preservation of water by a reservoir changes the natural seasonal variations in the water flows and nutrients supply thus affecting the quality of biodiversity. The supply of nutrients due to damming may affect flora and fauna in the downstream area. Large dams exert an impact on the flora and fauna in that the area of

the dam is in most cases permanently submerged thus trapping any nutrients coming into the dam either through a river/stream or rainfall runoff. The water in the reservoir is enriched with nutrients thus in the longrun the water in the dam/reservoir becomes eutrophicated.

6.5 Water Quality Degradation

Some areas of the rivers feeding the Lake Victoria and the shore line are polluted by municipal and industrial discharges. Polluting industries in the Lake include the breweries, leather tanning, fish processing, agroprocessing (sugar and coffee) and abattoirs. Apart from the Breweries industry in Mwanza, the rest of the industries are common to the towns on the shores of Lake Victoria. Some of the industries have implemented pollution management plans but the majority have not.

Small scale mining of gold is also increasing in the Lake Victoria basin. A water quality survey carried out by the University of Dar es Salaam in 1994 around Lake Victoria revealed heavy pollution in rivers around the gold mining areas in Mara, Mwanza and Shinyanga regions.

Some small quantities of other heavy metals such as chromium and lead are also found in the lake. The trend is that water quality in the lake and the rivers feeding the lake are continually being degraded.

Water borne diseases (schistosomiasis and malaria) are on the increase, however relationship has not been established indicating disease increase with the increase in water quality degradation in the lake.

6.6 Water Hyacinth

Water eutrophication in the Lake has also resulted in the growth of water weeds. The problem was very severe before the introduction of the LVEMP. Control measures being taken by the project should be supported.

6.7 Improvement of Development Situation in the Basin

The development of the infrastructure in Lake Victoria basin need to be improved. There is need to improve communication, sanitation, water supply systems, planning of towns and villages irrigation and drainage systems. Without deliberate efforts being made to improve the situation environmental conservation will not be attained in the new future.

6.8 Oil Spills and Water Discharge into the Lake

Many of the ships and boats plying the lake are very old. They are badly in need of major rehabilitation. Due to their present conditions, they spill oils in the lake and they also discharge solid and liquid wastes into the lake as they lack enough facilities to handle them on board and discharge at the ports.

6.9 Natural Resources Use Conflicts

There are natural resource use conflicts in the basin between, those who wish to conserve the natural resources and those who wish to harvest them for their own use (e.g. villagers in searching for woodfuel) and miners who wish to clear the land for

mining and not forgetting peasants who practice shifting cultivation. Thus there is need for better planning, providing environmental awareness to the people and enforcing legislations.

Table 6.4 Environmental threats to water resources in the Lake Victoria Basin.

ISSUE	Symptoms/Impact	Immediate causes	Root causes	Extent	Severity	Remarks
Land Degradation						
Deforestation	▪ Decrease in tree cover ▪ Reduction in areas suitable for wildlife ▪ Loss of vegetative soil cover ▪ Inducing of soil erosion ▪ Loss of pastoral vegetation ▪ Depletion of natural soil fertility ▪ Encroachment in protected forest areas	▪ Cutting down of trees for fuelwood, building materials, fodder for livestock and medicinal purposes. ▪ Human migration causing pressure on the land ▪ Fish smoking and brick burning ▪ Tobacco smoking ▪ Forest fire ▪ Shifting cultivation	▪ Rapid increase in human population ▪ Poverty ▪ Low awareness on level by the public ▪ Lack of alternative sources of energy and construction materials ▪ Low level of technology to maximize agricultural production per unit area of the land. ▪ Low level of planning and enforcement of legislation	Basin wide but severe in: ▪ Majita, Issenge and Kowak Division of Mwanza Region ▪ Mwanashimba, Ibinda, Bubinza, Kabila, Kisesa, Sengerema, Geita, Misungwi and Buswelu Division of Mwanza Region ▪ ▪ Some District of Kagera Region	Severe	
Soil erosion	▪ Fast removal of top soil ▪ Loss of vegetative soil cover, ▪ River bank soil removal by scouring ▪ Floods ▪ Declining soil fertility and crop production ▪ Migration	▪ Deforestation ▪ Overgrazing ▪ Inadequate soil conservation measures ▪ Improper landuse management ▪ Topography and rainfall pattern	▪ Increasing human population ▪ High livestock population ▪ Poverty ▪ Low level of awareness on soil conservation measures	Basin wide but mostly in steep areas. Mara, Mwanza and Shinyanga Region.	Very severe	
Wetland degradation	▪ Low ground water recharge ▪ Unable to control floods ▪ Incapable of retaining sediments ▪ Cannot easily be used for transportation or recreation ▪ Decrease in fresh water.	▪ Agricultural industrial and domestic pollution ▪ Human activity ▪ Farming ▪ Deforestation ▪ Water hyacinth infestation	▪ Non existence of a wetland policy ▪ Low awareness on protection of wetlands ▪ Agricultural activities ▪ Population pressure in the basin	All around the wetlands (Lakes and flood plain included)	Severe	

River bank and lakeshore degradation	▪ Down stream siltation and erosion ▪ Change in river course ▪ Increase in siltation ▪ Aquatic life affected	▪ Human concentration ▪ Animal concentration ▪ Intensive devegetation ▪ Non enforcement of regulations on soil and water conservation	▪ Urbanization ▪ Agricultural activities ▪ Tourism facilities constructed around the Lake Victoria shores	Around Lake Victoria and around the rivers entering the Lake.	Severe	
Mining impacts	▪ Deforestation ▪ Erosion ▪ Baseland ▪ Large open abandoned mining pits	▪ Removal of vegitation cover ▪ Use of toxic chemicals thus polluting water bodies	▪ Lack of enforcement of mining legislation. ▪ Low awareness by artisanal miners on environmental conservation ▪ Lack of EIA'S for mining project	Almost in all the districts of Mwanza Region and parts of Shinyanga and Kagera regions	Severe	
Loss and destruction of valuable species, special ecosystems and habitats	Decrease in tree species, birds, butterflies wild animals, fish species, flora/fauna	Deforestation, (for fish curing and loging) fuelwood gathering by mostly refugees and construction materials. The activities threaten wild life which affect tourism hunting. Also introduction of Nile perch in the Lake has resulted in the absence of some fish species in the lake. Overfishing has also led to disappearance of some fish species.	▪ Lake Victoria Basin has higher pressure of rural population then most other parts in the country. ▪ Inadequate environmental planning and enforcement of environmental legislation ▪ Deforestation	Lake Basin area especially the lake itself, reserved forests and game reserves.	Moderate to severe.	
2. WATER QUALITY DEGRATION						
Pollution (point and non point source)	Water unsuitable for domestic and industrial use.	▪ Introduction of industrial and domestic effluents in the lake water sources ▪ Introduction of surface runoff from agricultural fields where fertilizers have been used. ▪ Introduction of agrochemicals substances in water sources during rains.	▪ Inadequate environmental planning ▪ Proper land use ▪ Enforcement of environmental regulations ▪ Inadequate environmental monitoring ▪ Security of land tenure	Lake Victoria Basin area	Moderate to severe	

Eutrophication	▪ Growing of water weeds ▪ Increase in the growth of "fauna"	Introduction of nutrients from industrial and domestic effluents as well as agrochemicals in run off	▪ Pollution of water source due to inadequate environmental planning for industries and urban centres in general ▪ Poor landuse practices	Land Victoria	Severe	
Water weeds infestation.	▪ Water weeds growing and spreading like a mat on the water ▪ Navigation difficulties ▪ Slowdown on fishing activities resulting low fish catches ▪ Interferance in the marine food chain ▪ Decrease in oxygen in the water which will affect organisation in the water	Introduction of nutrients into the water	▪ Industrial, domestic and agrochemical pollution of water sources ▪ Inadequate planning and enforcement of environmental regulations ▪ Poor landuse practices	Lake Victoria	Severe	
Water Borne Diseases	▪ Deterioration of health of the people ▪ Reduction of the work force ▪ People suffering from water borne diseases such as schistosomiasis and malaria.	Use of polluted water by industrial effluents, domestic sewerage agrochemicals and solid wastes.	▪ Pollution of the water ▪ Inadequate observance and enforcement of water pollution regulations ▪ Water weeds intested areas being breeding ground for mosquitoes and snails.	Lake Victoria and Basin water sources	Severe	
Siltation	▪ Short life span of water resevoirs (dams etc). ▪ Covering of forms and plains during flooding ▪ Toxic substances in the silt (sediments)	Heavy rainfall - soil erosion	▪ Inappropriate Land management practices ▪ Deterioration of forest resources in the area ▪ Inadequate enforcement of environmental protection legislations	1. Arid and semi arid regions	Moderate	

Sewerage discharge in lakes (from boats)	Localized Lake and beach pollution	Discharge from boats	Inadequate domestic Wastes treatment at the ports	The waters of the Lake Victoria	Moderate	
INDUSTRIAL ISSUES						
Sanitation concerns (urban run off sewage discharge)	▪ Urban pollution ▪ Water source Pollution (Lake Victoria) ▪ Poor sanitation ▪ Inadequate liquid and solid waste disposal	▪ Rapid growth of the urban population ▪ Inadequate planning for urban housing resulting in lack of water supply systems and liquid and solid waste disposal systems ▪ Lack of enforcement of solid waste management regulations	▪ Inadequate planning and enforcement of environmental protection legislation. ▪ Poverty ▪ Lack of capital investment	▪ Urban centres in Mwanza, Bukoba and Mwanza ▪ Villages and tourism hotels in the shores of Lake Victoria ▪ All the towns in Lake Victoria Basin	Moderate to severe	
Urban planning and industrialization on Lake shores and Rivers banks	▪ Lack of adequate liquid and solid wastes disposed systems ▪ Pollution of water in lake resulting in water hyacinth ▪ Increase of water related diseases	▪ Inadequate environmental planning ▪ Inadequate environmental assessment ▪ Enforcement of environmental protection by laws which are cent by town councils	Non adherence to environmental planning and standards in the construction of residential and commercial houses/building as well as industrial	▪ The problem affects all urban centres in the country including the basin it is mostly observed in the towns of Mwanza, Bukoba and Musoma	Severe	
Water Borne diseases	Decrease in manpower strength a situation which has adverse effect on the economy	▪ Use of polluted water for domestic purposes and recreation ▪ Mosquito bites resulting in Malaria ▪ Lack of hygiene due to inadequate liquid and solid waste disposal	▪ Industrial and domestic effluent water pollution ▪ Inadequate liquid and solid waste disposed ▪ Inadequate enforcement of environmental protection legislation ▪ Lack of environmental awareness in the rural areas	1 All urban centres in the basin as well as village in the Lake Victoria Basin	Moderate to severe	
Disaster Preparedness and remediation						
Navigation risks aids and mapping	Extensive and / Groundings	Limited navigational devices and poorly separated traffic	Complex navigational hazards	Lake Victoria which in plied by many ships and boats	Severe	

Oil spills (tons)	Water contamination, damage to coastal and acquatic life.	Tanker cleaning discharge of ballast and bilge water, discharge of waste oil bunk oil spill.	▪ Lack of reception facilities at ports of lake, inadequate control, lack of enforcement	Localized through out the Lake	Moderate	
Floods and droughts	▪ Erosion, sediment deposition ▪ Over flooding of farms ▪ Settlement shifting	Rainfall flooding due to sha of the catchments, shape of river and landuse practices.	Land use management and practices	1 Lake Victoria basin Simiyu river 2 Rufiji basin, Matonda River, Malagarasi and Mbemkuru river	Moderate to severe	Lake Victoria Basin.
Refugee problems	▪ Spread of diseases in refugee camps ▪ Deforestation for fuelwood building materials ▪ Pressure on water resources ▪ Pressure on health services ▪ Pressure on sanitation reserves ▪ Threat to wildlife habitats in Bagiri (Game reserve, Nyumbwa game reserve and others.	Political instability in neighboring countries.	▪ Political instability in Ruanda and Burundi ▪ Migration of large numbers of people to refugee camps in Ngara, Karagwe and Muleba districts.	Localized in Lake Victoria Basin Muleba Ngara and Karagwe Districts (Lake Victoria Basin)	Severe Severe	
Uncertain Impacts an climate change	▪ Loss of species ▪ Ecosystem degradation ▪ Impacts on food security ▪ Wildlife habitat deterioration ▪ Desertification	▪ Irregular rainfall and its distribution ▪ Forest fires	Non implementation Land degradation control measures	Mara and Mwanza Region	Moderate to severe	

Table 6.2 Threats to the Coastal and Marine Environmental Resources in Tanzania (Lake Victoria Basin)

7.0 RECENT, CURRENT AND PLANNED INITIATIVES

As has been described in the chapter on "Environmental Threats to Water Resources; the water resources in Lake Victoria basin are threatened by deforestation, soil erosion, irrigation in wetlands, mining activities, loss and destruction of special species in ecosystems and habitats, pollution, eutrophication, siltation, water weeds, domestic sewerage, discharge of sewerage from boats, poor urban planning and industrialization, navigation oil spills, floods and drought, refugee problems and changes of climate. Measures to redress the situations are being taken seriously by the central and local governments. The problem of inadequate funding in various sectors by the governments makes the exercise to proceed slowly. Programmes with funding components from donors have been initiated in various areas with a view to eradicate the environmental threats to the water resources in the basin.

The following are some of the initiatives taken by government, donors and the NGOs in the Lake Victoria Basin.

7.1 Lake Victoria Environment Management Project (LVEMP) (1997-2001)

Lake Victoria Environment Management Project is a regional project implemented jointly by Tanzania, Uganda and Kenya. The project which is funded by IDA and GEF grant through the World Bank to the order US$ 77.6 million aims at reversing the deterioration of natural resources and environmental conditions of the Lake Victoria ecosystem, for the benefit of the people who live in the basin, the national economics and the global community.

The project encompasses various environmental conservation activities in the basin. They include, fisheries management, water quality and ecosystems management, water hyacinth control, soil and water conservation, catchment afforestation wetlands management and capacity building to research organizations.

7.2 Operational Water Resources Management and Information Systems in the Nile Basin Countries Project (1996-1999)

The operational Water Resources Management and Information Systems in the Nile Basin Countries, is a regional project implemented jointly by the Nile Basin Countries and F.A.O. Financial assistance was obtained from the Italian Government to the order of US$ 3.6 million. The project stretched from 1996-1999 and is now entering the second phase. It has the following objectives:

- To facilitate the adoption of adequate, well harmonized national water policies in the participating Nile Basin States;
- Institutional strengthening and training in legal, organizational and technical issues related to integrated river basin management and the allocation of transboundary water resources;
- Development and distribution of tools, and training in their use, for the analysis of the physical, social, economic and environmental impact on each country of existing and future proposals for the development of water resources by the riparian countries.

- The definition and implementation of an improved and financially sustainable water resources monitoring system.

7.3 Information system for Water Resources Monitoring and Planning in the Lake Victoria basin (1996-1999)

The project focused on the countries sharing Lake Victoria. It was four a year project (1996-1999) funded by the Japanese Government and implemented jointly by FAO and the governments of Tanzania, Kenya and Uganda.

The project responded to the need felt by the lake countries to urgently address their common interests for: monitoring, planning, management and protection of water and related environmental conservation measures on the land resources in the lake regions of the countries sharing Lake Victoria. The project budget was US$ 4.9 million.

7.4 National Conservation Strategy for Sustainable Development (NCSSD) (1994)

The National Conservation Strategy for Sustainable Development (NCSSD) is a proposed framework for integrating development and conservation in the knowledge that rational resource use will lead to sustainable development.

The need for a National Conservation Strategy (NCS) was recognized by the Act of Parliament No. 19, 1983 which established National Environment Management Council (NEMC in 1983). The work to develop NCSSD was carried out and coordinated by NEMC. The process started in 1988 when the initial planning was undertaken. The document was reviewed and approved by the NEMC Board of Directors on September 1994.

7.5 East African Sub-Regional Project on Environmental Law (1997 - 1998)

The main objectives of East African Sub-regional Project on environmental law were to harmonize relevant legislation cross the region particularly in respect of shares transboundary resources and concerns as a basis for regional cooperation and in collaboration Areas identified as essential component of this project includes: Lake Victoria ecosystem, Wildlife management,. Forestry resources, Environmental Impact Assessment, Environmental standards, Hazardous wastes Toxic chemicals and non-hazardous wastes.

The activities of this project commenced in January 1997 it was expected to be finalized December 1998. The project was supported by the Royal Danish Government at an amount of US$ 200,100 and was executed by UNEP, and UNDP. Then Vice President's Office, Division of Environment coordinated the project activities in the country.

7.6 Participatory Environmental Resource Management (PERM) Project (1995 - 1999)

This is a five year programme. The project was planned to take place from 1995 to 1999 but it did not start as scheduled due to some anomalies. The implementation of project activities started in 1997.

The project aimed at strengthening Community Based Natural Resources Management in (CBNRM) in Tanzania. The project covers Ugalla and Tarangire ecosystems.

The project is funded by USAID to the amount of US$ 10 million.

Project activities are implemented by the Ministry of Natural Resources and Tourism in collaboration with TANAPA and District Authorities in these areas under the coordination of Vice President's Office, Division of Environment.

7.7 The National Biodiversity Strategy and Action Plan (NBSP) (1998 - 2000)

The development of a National Biodiversity Strategy and Action Plan Started in March 1998 and it was expected to be finalized in the year 2000. The formulation of NBSP has been undertaken through a consultative process which involved consultations at various levels.

The main objective of NBSP formulation is to ensure sustainability of the country's dependency on biodiversity for socio-economic development in terms of rendered ecological services, provision of food and medicines, source of building materials and energy and as decomposers of waste for enrichment of soils and aquatic environment. The project covers the whole country.

The formulation of NBSAP was supported by the Norwegian Government to the amount of US$ 175.65 million.

Division of Environment under Vice President's office is the CBD Focal Point and was given a mandate to formulate NBSAP.

7.8 National Action Programme to Combat Desertification (NAP) (1997 - 1999)

The need for the formulation of National Action Programme was emphasized during the preparation of the United Nations Convention to Combat Desertification. The Convention envisages that its implementation will be effected through Action Programmes at national level.

The main objective of National Action Programme to Combat Desertification is to identify the factors contributing to desertification and practical measures necessary to combat desertification and mitigate the effects of drought in the country. The formulation of NAP process started in 1997/98 and finalised in 1999. The project covers the whole country.

The formulation of NAP document was supported by UNDP and UNSO to the amount of US$ 350.000.

The final draft document of the National Action Programme has been completed. Detailed phase II proposal is being prepared. A draft cabinet paper to adopt the programme is being prepared. The Division of Environment in the Vice President's Office is the National Focal Point for NAP process.

7.8 Capacity Building for Environmental Management and Pollution Abatement in Mwanza Region, Tanzania

This programme is a support to the implementation of National Environment Action Plan (NEAP). The project will deal with preparation of a dynamic strategic development plan and investment strategy to improve environmental conditions in Mwanza municipality and consequently in Lake Victoria. The project commenced in January 1998 and will last for six years.

The project is funded by DANIDA under MIKA framework. The first phase is estimated to cost 14 million Danish kronor.

The project is coordinated by the Prime Minister's office in collaboration with Mwanza municipality.

7.9 National Biological Diversity Study Project (1995 - 1996)

The overall objective of the project has been to gather and analyse biological and socio-economic data that would provide information as a basis for the development of the National Strategies programmes and Action Plans for the conservation and sustainable use of our biological diversity. It is also one of the basic tools for the implementation of the convention on biological diversity.

The study was carried out between April 1995 and March 1996 and the consolidated report was adopted by the National Technical Committee in 1997 Nationwide (Tanzania mainland).

The National Environment Management Council (NEMC) coordinated this project on behalf of the Government.

UNDP was the main funding agency with a contribution of 240,500 US$ while the Government of Tanzania contributed 50,000 US$.

7.10 Implementation of the country programme to phase out Ozone Depleting Substances (ODSs) (1997 - 2000)

In 1996/97 the Government completed the preparation of the country programme to phase out ozone depleting substances. The programme was financed by UNEP. Implementation of this programme started in 1997/98 and will last for three years. The objective of the programme is to phase out gradually consumption of all ODSs lay the year 1020. The project covers the whole country.

UNEP is funding the implementation of the programme to the amount of US$ 1,360.612.

Cleaner Production Centre of Tanzania CPCT) is coordinating the implementation of this programme on behalf of the Government.

7.11 The Tanzania Forestry Action Plan (1989)

In 1985 FAO developed the Tropical Forestry Action Plan (TFAP) pursuant to the adoption of the TFAP, tropical countries were directed to review the national forest policies and develop their own Forestry Action Plans. This was followed by the development of the Tanzania Forestry Action Plan (TFAP) 1989). The document identified major problem areas in the forest sector and developed a progoramme for various forestry disciplines.

The main objectives of TFAP are:

. i To review past policies and development efforts;
. ii To prepare long-term strategy and establish necessary quantitative targets.

iii. To compile an action plan including programmes for development activities and institutional support and
iv. To present project profiles to implement the plans.

In 1994 the performance of the TFAP was reviewed. Among the issues cited as achievement include participatory consultation with villagers to raise their awareness about forestry and environmental issues.

The revised TFAP of 1994 has the following major strategies:

- More integrated approach in solving local-level land use problems;
- Involving local people, villages and districts in the eventually detailed problem identification, planning and implementation of action.
- Increasing the role of the private sector and NGO in the implementation of local projects and programmes.

The practical implementation of NFAP was hampered by lack of adequate human and financial resources. Other shortfalls during the period are related to institutional framework. The land tenure system has not yet been clear an ownership and property right of forest lands. This deficiency has hundred forest development.

The main actor to fund the implementation of TFAP remained to be the government's Executing Agency: Forestry Ministry of Natural Resources and Tourism was the executing agency.

7.12 Rhino Conservation Programme

This is a long-term programme aimed to protect the already threatened rhinocerus species in the country.

The main objectives of this programme are:-

i. Conservation of the few rhino population remain in their habitats.
ii. To promote breeding project of rhino to increase the population at the close observation.

All areas formally used as a rhino habitats in the country. Two types of protection are available:

i. Protection in free range;
ii. Closed small range

It is a long-term programme

Executing agency : Ministry of Natural Resources and Tourism Department of Wildlife

No.	Name of Project	Other Donor apart from GEF	Time-frame
1	Reducing Biodiversity Loss at Cross-border Sites in East Africa	UNDP	1998-2002
2.	Lake Victoria Environmental Management Programme	UNDP, World Bank, Government	1997-2001
3.	Lake Tanganyika Biodiversity and Pollution Control Project	UNDP	1995-2000
4.	Regional-Based Assessment of Persistent Toxic substances	PDF – B, UNEP Germany, Switzerland, Based Convention	2000-2002
5.	Conservation education for Malihai Clubs of Tanzania	UNDP – FAO	-
6.	Support Pasiansi Wildlife Training Institute	UNDP-FAO	-
7.	Lake Nyasa Biodiversity Conservation	UNDP	-

Table 7.1 Previous and Current GEF project in the country

PROGRAMME	PERIOD	BUDGET MS $	IMPLEMENTING AGENCY/DONOR
• Lake Victoria Environment Management Project	1997 - 2001	77.6 Million	IDA/GEF
• Operational Water Resources Management and Information Systems in the Nile Basin Countries Project	1996 - 1999	3.6 Million	Italian Government F.A..O
• Information Systems for Water Resources Monitoring and Planning in the Lake Victoria Basin	1996 - 1999	4.9 Million	JICA/FAO
• East African Sub Regional Project and Environmental Law.	1997 - 1998	200,100	Netherlands, UNEP and UNDP
• National Conservation Strategy for Sustainable Development (NCSSD)	1988 - 1994	-	-
• Participatory Environmental Resources Management Project (PERM)	1997 - 1999	10.0 Million	USAID
• National Biodiversity Strategy and Action Plan (NBSP)	1998 - 2000	175.65 Million	Norwegian Government
• National Action Programme to Combat Desertification (NAP)	1997 - 1999	350,000 Million	UNDP and UNSO
• Capacity Building for Environmental Management and Pollution Abatement in Mwanza Region	1998 - 2003	14 Million * Danish Kronor	DANIDA
• National Biodiversity Country Study Project	1995 - 1996	290,500	UNDP, Tanzanian Government
• Implementation of the Country Programme to phase one Ozone Depleting Substance (ODSs)	1997 - 2000	1,360,612	UNEP

PROGRAMME	PERIOD	BUDGET MS $	IMPLEMENTING AGENCY/DONOR
• Tanzania Forestry Action Plan	1989	5.1 Million	GTZ
• Rhino Conservation Programme	1994 - 1995	0.75 Million	European Union
• Conservation Program in Angola, Sychelles and Tanzania (Bird Conservation)	1995 - 1996	0.15 Million	European Union
• Tanzania Forestry Action Plan	1991 - 1996	1.3 Million	Finland

Table 7.2 Recent Current and Planned Environmental Initiatives Programmes in Lake Victoria Basin and in the country as a whole

7.13 Lake Victoria Initiatives

SIDA in collaboration with East Africa Community partner countries is preparing an initiative aimed at supporting socio economic activities in the Lake Victoria basin.

7.14 The Lake Region Water Master Plan

Between 1996 and 1998 BROKONSULT AB of Sweden with financial support from SIDA executed a Water Master Plan of Lake Victoria Basin. The master plan studies covered state of the water resources potential in the basin, land and other natural resources, agro-activities as well as environmental land degradation state and factors in the basin. The masterplan was prepared for the Ministry of Water.

7.15 HESAWA (Health, through Sanitation and Water)

The project emphasizes on improved health of the people in the Lake Victoria Basin ensuring that they have sanitation facilities and sources of adequate clean and safe water. The project involves Mwanza, Kagera and Mara Regions; The project which is funded by SIDA constructs water schemes, builds VIP latrines in villages and construct dispensaries and health centres. The project concentrates on the rural areas.

7.16 Urban Sector Rehabilitation Project (USRP)

The project is principally funded by the World Bank (IDA). The objective of the project which started in 1996 to rehabilitate urban infrastructure (water supply, sewerage systems and roads).

The project is covering water supply and sewerage systems in the municipalities of Tanga, Moshi, Arusha, Iringa, Dodoma, Tabora, Morogoro and Mwanza in the Lake Victoria Basin.

In Mwanza municipality rehabilitation of the existing sewerage system is shared between USRP and EU whereby European Union is to rehabilitate the rising main from Mirongo pumping station at Mirongo River to the oxidation ponds and USRP in to rehabilitate the sewerage the collective system. Rehabilitation of the collection system has been completed in September, 1999.

Budget for the project is:

USRP US$ 1,000,000
European Union US$ 2,000,000

IDA is giving emphasis to capacity building initiatives in order to sustain the rehabilitation efforts already undertaken.

7.17 ECOVIC

This is a regional forum for NGO's and CBO's formed in December 1998 and registered as an international NGO with its headquarters in Mwanza.

The objectives of the NGO are:

- Promote and coordinate community based activities for sustainable utilization of Lake Victoria sustainable utilization of Lake Victoria resources so as to alleviate proverty in the region.

- Liaise with governments of regions to promote community participation in the management of Lake Victoria Resources.

- Sensitize communities and promote environmental restoration programmes in the Lake Victoria Basin.

The organization also an office in Kampala. The activities of ECOVIC will comprise of drawing of a community Action Plan, mobilizing the community in the Lake Victoria Basin. Mobilize financial and material resources for conservation environmental degradation aspects in the Lake Victoria Basin.

8.0 OPPORTUNITIES

In Lake Victoria basin, it has been found that environmental conservation can be attained, among others, if actions are taken to combat land degradation, water quality degradation, deteriorating sanitation situations in urban areas and non treatment of domestic and industrial wastes being discharged into the lake and finally but not least ensuring that navigational risks and mapping are attended to.

Lack of environmental awareness and poverty have been singled out to be the major causes of environmental degradation followed by socio-economic issues including food security and migration of the local population in the basin. Issues such as climatic changes, biological diversity and availability of fresh water supply has contributed to environmental degradation of the lake.

The consultation process has revealed some common opportunities in the basin which if acted upon will improve the life of the people as well as reducing or completely removing certain aspects of environmental degradation. They include, need for:

8.1 Carrying out the following in order to control land degradation in the basin:

- Empowerment programme for local communities to conserve and manage natural resources (soil and water) in their areas of jurisdiction;
- Instituting awareness programmes for all stakeholders in the basin;
- Capacity building at district and village level on natural resource conservation;
- Instituting ecological monitoring programmes ;

- Water resource development programmes;
- Agricultural and Livestock development programmes;
- Instituting programmes which will provide alternative sources of energy instead of woodfuel for cooking.

8.2 Improvement of communications such as roads and telephone infrastructure in the basin. Good infrastructure in the basin is a necessary link when implementing environmental conservation activities in the basin. The infrastructure has been damaged by the refugees and the *El-nino* rains especially in Kagera region. Countries which would benefit from this improvement are Rwanda, Burundi, Uganda and Kenya

8.3 Environmental planning when new land development activities along the shores of Lake Victoria and major rivers entering the lake are taking place. Such planning is important as the shores of these water bodies are severely degraded resulting in siltation, water weeds infestation, water pollution and even soil erosion problems.

8.4 Promoting and strengthening research and training institutions. This is important due to the fact that there is inadequate research data and information that constitute a major bottleneck on efforts to control land degradation.

The research and Training institutions are expected to develop user oriented research priorities, coordinate research and production, coordinate environmental research and information dissemination and improvement of indigenous technology.

8.5 Management of domestic and industrial wastes being released into Lake Victoria. Lake Victoria Environment Management programme is conducting studies on the pollution loading, in the lake and sources of pollution. It is however important to manage the pollution by educating the industrialists and town councils on the need to treat their wastes before being discharged n the lake and also to educate them on the type of treatment needed. The public and peasants are also to be educated on environmental pollution control.

8.6 Promotion of urban sanitation rehabilitation for all the towns along the shores of Lake Victoria. The activities of the urban sector rehabilitation project in Mwanza should be strengthened to cover the remaining towns of Musoma and Bukoba.

8.7 Development and promoting aquaculture in order to increase fish production and consumption as an economic venture for the common people in the basin. This is one of the ways of prevailing food and alleviating poverty in the basin.

8.8 Supporting navigation activities in the basin by rehabilitating the ships and boats plying the lake, providing navigational maps and navigation aids.

8.9 Harmonization of environmental legislation on biodiversity and water hyacinth control and management in the Lake Victoria.

8.10 Regular monitoring of crossborder water resources in order to control pollution of water bodies in shared water resources like Kagera river and Mara river.

8.11 Harmozing policies on environmental conservation for crossborder wetlands. This is important in protecting the wetlands and the biodiversity.

8.12 Establishing a mechanism which will provide information on when to expect disasters and procedures on what to do when disasters occur. Information centre could be established for equatorial Lakes region where there will also be information sharing and experience on disaster preparedness.

9.0 STAKEHOLDER ANLAYSIS AND CONSULTATION PROCESS

In the consultation process key stakeholder institutions involved in environmental conservation, natural resources use and conservation were involved. The exercise involved consultation with relevant Government Ministry's, Institutions, NGOs and Individuals concerned with environmental conservation and natural resources use and conservation in Lake Victoria Basin. In the course of the exercise it was noted that time was limited, it will therefore be necessary to carry on the consultation process with the NGOs within the Lake Victoria Basin, Donors and Implementers of various projects in the basin. Massive information was collected from various documents and national reports which have been used as a basis for preparing the report.

The consultation process involved the following:

- The Ministries and Agencies responsible for Environment, Natural Resources, Health, Local Authorities, Tourism, Wildlife, Transport, Communications, Agriculture, Irrigation, Land Use and Fisheries.
- NGOs dealing with environmental conservation and natural resource use and conservation.

The following stakeholder Institutions and agencies were consulted with:

- The Vice President's Office (Environment Division)
- Ministry of Water
- Ministry of Natural Resources and Tourism
- National Environment Management Council
- Ministry of Lands (Fisheries Division)
- Ministry of Communication and Transport.
- Ministry of Local Government
- Ministry of Health.
- National Land Use Planning Commission
- University of Dar es Salaam (B.R.A.)
- Urban Water Supply and Sewerage Authority – Mwanza
- HESAWA – Mwanza
- Lake Victoria Environment Management Project
- The Town Council Directors Office – Mwanza

After the consultations the draft report was prepared and a National Workshop was held at New Africa Hotel in Dar es Salaam on 28th February, 2000.

The following stakeholder Institutions were represented at the workshop; where they commented upon the 1st draft of the National Paper on Environmental Analysis of the Lake Victoria Basin:

- The Vice President's office (Environment Division)
- Ministry of Water

- National Land Use and Planning Commission
- Ministry of Agriculture and Co-operatives (Crop and Irrigation Division)
- National Environment Management Council
- Ministry of Natural Resources and Tourism
- Ministry of Energy and Minerals
- Ministry of Communications and Transport
- University of Dar es Salaam
- Ministry of Local Government
- UNDP, (Environment Division)
- Ministry of Health
- Ministry of Lands

During the workshop NGOs were not represented but due to their importance in the consultation process a meeting of the key NGO's in Dar es Salaam was held on 15th March 2000 in Dar es Salaam where the following NGO were invited: WWF, TATEDO, ENVITECH, WCST, TANGO, JET, AGENDA and TACOSODE. Their views on natural resources management and environment conservation in the Lake Victoria Basin are reflected in the relevant areas of the report. Since there are a number of NGOs in the Lake Victoria Basin which due to shortage of time they have not been consulted, I have sent them a letter informing them of the NBI initiative and have requested for their comments on areas of environmental conservation and natural resources use and conservation which so that their wishes will be accommodate in the project preparation phase.

The final draft of the report has therefore taken consideration of the comments and comments and recommendations made during the consultation process.

9.1 CONSULTATIVE PROCESS ON NGO's

During the consultation process an effort was made to publicize the N.I.B. and areas of the socio-economic Environmental Analysis and Management component of Pillar D where NGO's and CBO's based in the basin and those based elsewhere in the country could participate. More than 15 NGOs working on environmental issues in Lake Victoria Basin have been identified. Of the 15 NGOs about five have been identified to have a strong base in the basin. They include Nyanza Environment and Conservation of Nature (LANESO), Lake Victoria Environmental and Conservation (LAVECO), Green Shinyanga Group (GSG), Journalists Environmental Association and Kagera Credit Fund (KCF).

The NGOs can be involved in various aspects of environmental conservation aspects in the basin ranging from afforestation programmes, public information dissemination through mass media, workshops and meetings, organization of training programmes for CBO's and stakeholders, formation of environmental management committees and other related environmental conservation issues.

A meeting with NGO's based in Dar es Salaam, was held on 15th March 2000. BGOs, which attended the meeting, included AGENDA, WWF, TATEDO. Also information from WCS, JET, and Green Shinyanga Group had been obtained earlier through consultations with the NGOs by the National Consultant.

In general the NGOs have all been involved in environmental assessment, environmental conservation information dissemination, environmental impact assessment and capacity building through various training programmes.

Name of NGO	Activities Performed	Areas where they can be involved in the N.B.I. in the basin
1.0 WWF (World Wildlife Fund)	▪ Development of Wildlife conservation ▪ Afforestation programmes ▪ Establishment of game reserves and protected areas ▪ Establishment of marine parks in Mafia and Zanzibar ▪ Environmental education programmes ▪ Have just completed a 5 year strategic plan	▪ Natural resources conservation in Mara and Gurmet rivers ▪ Conducting E.I.A. and natural resources conservation ▪ Environmental education programmes
2.0 AGENDA (NGO's name originates from Agenda 21)	▪ Development of environmental conservation materials ▪ Training programmes (capacity building) for CBO's ▪ Conducting training to small enterprises to be able to conduct their own E.I.A. in an effort to control environmental degradation ▪ Conducting environmental research in various aspects ▪ Have participated in developing the Environmental Conservation Strategy in Tanzania	▪ Environmental awareness to the basin community ▪ Environmental research ▪ Environmental degradation control in Lake Victoria
3.0 TATEDO (Tanzania Traditional Energy and Environment Organisation)	▪ Promoting renewable energy systems ▪ Promotion of wood stoves ▪ Promotion of afforestation programmes ▪ Promotion of solar energy ▪ Promotion of training programmes on environmental conservation ▪ Promotion of awareness programes on environmental issues	▪ Promotion of renewable energy programmes ▪ Promotion of afforestation programmes ▪ Environmental degradation awareness ▪ Training programmes for CBOs
4.0 JET (Journalists Environmental Association)	▪ Dissemination of information on environmental degradation through media ▪ Training programmes for CBOs ▪ Setting of environmental conservation committees	▪ Dissemination of information on environmental degradation through the news media ▪ Training programmes for CBOs ▪ Setting of environmental conservation committees.
5.0 GSG (Green Shinyanga Group)	▪ Environmental Health Programmes in the Lake Victoria zone ▪ Holding of workshops, seminars on fisheries management ▪ Involvement of youth groups in setting up tree nurseries for the reforestation of Lake Victoria ▪ Involvement of environment conservation committees and CBOs in pollution control efforts in Lake Victoria ▪ Joint venture with other organizations to review and harmonize environmental impact assessment	▪ Afforestation programmes ▪ Water pollution control programmes ▪ Public awareness programmes ▪ Training programmes on environmental conservation
6.0 WCST (Wildlife Conservation Society of Tanzania)	▪ Wildlife conservation of threatened animal and bird species and tree species ▪ They are funded by various donors including UK, UNDP, GEF, DANIDA	

Table 9.1: Activities performed by some NGO's and areas where they could be involved in N.B. I in the Basin.

Swedish Society for Nature Conservation (SSNC), European Union, IUCN, the Royal Society for Protection of Birds assists WCST in some elements of Important Bird Areas (IBA) Programme such as sponsoring production and publication of Swahili Bird Guide Book, bind walks, IBA workshops etc.

Presently they are involved in Kitulo Plateau, Usangu Flats, Dar es Salaam, East Usambara's Magiroto Forest where environmental threats include deforestation; overgrazing; dynamite fishing; pollution and rapid population growth, encroachment for farming pole casting and bird trapping.

10.0 PRIORITY ACTION

Following the consultation process, the following have emerged as priority actions to supplement ongoing efforts to conserve environmental degradation of the water resources and other natural resources in the Lake Victoria Basin on Tanzania.

10.1 Land Degradation

Land degradation due to deforestation, improper land use practices, overgrazing, inadequate implementation of land conservation measures, low awareness on land conservation measures and inadequate enforcement of appropriate legislation has been found to be a major problem affecting a large part of the basin. Parts of the basin experience soil erosion siltation and floods. Priorities in this area include supporting central and local government efforts in soil conservation, raising public awareness better agricultural techniques and environmental conservation awareness.

10.2 Water Pollution Control

The lake experiences point source and non point source pollution. These sources bring into the lake different pollutants such as organic and inorganic substances, toxic substances, flora, fauna and sediments which change the ecological characteristics and the water quality of the lake.

A priority action needed to combat water pollution:

- Raising peoples awareness on ill effects of polluting the water: human diseases, siltation, eutrophication and eventually growth of water weeds in the lake.
- Rehabilitating waste water treatment infrastructure in the urban towns of Mwanza, and initiating waste water treatment facilities in Musoma and Bukoba.

10.3 Water Supply and Sanitation

Lake Victoria Basin contains 5.5 million people and there are three major towns situated at Mwanza, Bukoba and Musoma. There are also many villages with a total population of about 4 million people. The water supply coverage in the rural areas is estimated at between 40 and 50% while the coverage in the urban areas in 80.0%. Since the water supply is far from being adequate, people especially from the rural areas are forced to get water which is grossly polluted from other sources mostly by toxic matter resulting in contracting water borne diseases. The priority actions include assisting the government in searching and developing other sources of water such as dams, shallows well and others and also improving the water supply infrastructure in the basin by rehabilitating inoperative schemes. The most important donor on water supply and sanitation in the basin has been SIDA through the Health through Sanitation and Water Project (HESAWA).

The sewerage systems, in the urban areas in the basin need to be rehabilitated and expended. The implementation of the Urban Sector Rehabilitation Programme which currently involves Mwanza town only in the basin, needs some financial support so that

is activities could be expanded to the other towns of Musoma and Bukoba around the lake.

10.4 Genetic Species and Ecosystem Biodiversity

The Lake Victoria Basin in endowed with diversity rich in genetic, species and ecosystem resources. Currently however the resources are seriously being depleted. The threats to biodivesity have been human activities (fuelwood gathering and deforestation for various activities including fish curing and logging. The presence of more than 500,000 refugees from Rwanda and Burundi have increased the human pressure on the resources in the basin with adverse effects on both forests and wildlife. Munene Forest Reserve for example has only 70% of the forests resources, the Busenyi Forest Reserve, has undergone extensive clearing leaving behind a stunted forest almost devoid of birdlife. Priority action involve:

- i The need for supporting communities to conserve the land,
- ii Assessment of endangered species so that special measure are taken to conserve them
- iii Development of alternative sources of energy instead of use of fueldwood
- iv Initiating afforestation and reforestation programmes

10.5 Mitigating Desertification and Effect of Drought

In certain parts of Mwanza and Shinyanga regions of the basin where the land has been severely degraded, there are all signs of the land turning into a desert. Tanzania has prepared the National Action Programme to Combat Desertification. The state of the resources base in Tanzania has been grouped into three categories, namely: seriously, moderately and slightly degraded areas. The state of the natural resources base in the basin ranges from moderately to seriously degraded. The following priority programmes have been identified.

- i Education, awareness and information exchange and dissemination
- ii Water resources development programme
- iii Natural resource conservation and reforestation
- iv Capacity building
- v Agricultural and livestock development
- vi Provision of alternative sources of energy

Priority Actions in the Lake Victoria Basin (Tanzania)

NO.	ENVIRONMENT ISSUE	PRIORITY ACTION	SCALE	EMPHASIS	URGENCY
1.	Land degradation	▪ Establishment of natural resources conservation and reforestation programme ▪ Establishment of education, awareness and information programme ▪ Establishment of capacity building programmes at regional, district and village level	National Regional	▪ Soil Conservation ▪ Awareness creating ▪ Capacity building ▪ Land Management	XXX
	Overgrazing Soil erosion and siltation	▪ Establishment of livestock development programmes. ▪ Integrated landuse planning ▪ Development of land and water shed management plans	National National Regional	▪ Land use planning	XXX XXX
	Deforestation	▪ Development of agroforestry programmes on alternative sources of energy ▪ Integrated land use planning	National	▪ Development of household wood plantation ▪ Stoves ▪ Development of hydropower	XXX
	Flood and Drought	▪ Development of Drought Management Action Plan ▪ Strengthen the early warning system ▪ Establishment of a database ▪ Data exchange mechanism	National Regional (Tanzania, Kenya and Uganda)	▪ Capacity building ▪ Awareness programmes ▪ Management information	XXX

NO.	ENVIRONMENT ISSUE	PRIORITY ACTION	SCALE	EMPHASIS	URGENCY
	Navigational Risks (Lake Victoria)	▪ Provision and improvement of navigational aids, ▪ Conducting hydrographic surveys and update charts for key areas along shipping routes ▪ Development of an oil spills contingency plan ▪ The lake is used as a route to transport petroleum oil products within the countries sharing the lake ▪ Development of a rescue contingency plan	National Regional	▪ Capacity building ▪ Technical development ▪ Feasibility study on extent of navigational risk in ▪ Provision of poor navigational aid, maps, charts ▪ Development of an oil spills contingency plan ▪ Conducting hydrographical surveys ▪ Development of a service contingency plan	XXX
	Harmonization of Legislation	▪ Development of a plan to eradicate pollution of Lake Victoria by harmonization the laws and legislations enacted in Tanzania, Kenya and Uganda.	National Regional	▪ Capacity building ▪ Study existing environmental legislation ▪ Harmonizing the legislation	XXX
	Wetland Degradation	▪ Preparation of a wetland policy, guidelines and action plan	National	▪ Capacity building ▪ Collection analysis and exchange of information	XXX
	River Bank and Lake shore degradation	▪ Implementation of the landuse policy and Action plan. ▪ Enforcement of legislation	National	▪ Sediment Transport Studies ▪ Capacity Building ▪ Technical	XXX
	Desertification	▪ Implementation of the National Action Programme to Combat Desertification	National	▪ Development ▪ Soil and Water Conservation Programmes ▪ Afforestation and reforestation in programmes ▪ Land use practices	XXX XXX
	Industrial development infrastructure Community Development	▪ Development of EIA guidelines ▪ Development of strategies ▪ Feasibility study ▪ Development and implementation of poverty alleviation programmes	National National	▪ Feasibility study ▪ Capacity Building ▪ Technical Development ▪ Feasibility study ▪ Technical Assessment ▪ Technical Development	XXX
	Refugee Problem	▪ Political stability ▪ Contingency plan ▪ Precautionary measures	National Regional (Tanzania, Rwanda and Burundi)	▪ Sustainable development ▪ Rehabilitation of affected areas (deforested areas and water supply schemes and roads implementation ▪ Capacity Building	XXX

	Uncertain Impacts of Climatic changes	▪ Regulate human activity ▪ Control bushfires ▪ Regulate livestock keeping	National	▪ Capacity Building ▪ Awareness creation on conservation of natural resources	XXX
	Sewerage discharge in lakes and river banks	▪ Compliance with existing regulations ▪ Maintenance of waste water treatment plants and rehabilitation of sewerage infrastructure ▪ Creation of awareness of the problem to the public		▪ Rehabilitation of treatment plants and sewerage systems ▪ Capacity Building ▪ Technical Development	XXX
	Urban Development	▪ Improvement on solid waste management ▪ Updating urban master plans ▪ Regulations		▪ Feasibility study ▪ Capacity Building ▪ Technical Development	XXX
	Use of Pesticides	▪ Awareness of the problem to general public ▪ Proper land use practices ▪ Regulations	National Regional (Kenya, Tanzania and Uganda) (Kenya and Burundi)	▪ Monitor the pesticides in water bodies at cross border points ▪ Monitor implementation and use pesticides ▪ Awareness creation	XXX
	Protected Areas Degradation	▪ Regulation of migration into the basin ▪ Peaceful solution of the refugee problems ▪ Improving agricultural techniques so as to minimize shifting cultivation ▪ Consultation of the land of degraded areas ▪ Improving existing grazing lands and water supply	National Regional	▪ Awareness areas ▪ Capacity Building protected areas management ▪ Migration control ▪ Solving the refugee problem ▪ Harmonizing regulation on protecting cross border game and forest protected areas	XXX
	Mining Impact	▪ Development of management plan ▪ Implementation of existing legislation ▪ Carry out EIA's on all mining projects	National Regional (Tanzania, Kenya and Uganda)	▪ Awareness creation to miners (large and small) ▪ Capacity Building in carrying out EIA's for all mining project ▪ Enforcing existing legislation ▪ Monitoring of water quality to regulated mining pollution for crossborder situations	XXX

ANNEX I

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ANNEX II

LIST OF PEOPLE WHO WERE CONSULTED

Organisation/Institution	Name of Personal Consulted	Position
1. Vice President's Office	E. K. Mugurusi R.S. Mayungi Ms. R.D. Kisanga	Director Assistant Director (EIA) Senior Environment Officer
2. National Environment Management Council	Mr. P. Chisara Mrs. A. Maembe	Director Natural Resources Assistant Director
3. Ministry of Water	Mr. M. M. Kivugo Mr. J. Kobalyenda Mr. D. Ishengoma	Director of Water Resources Principal Water Officer Assistant to Coordinator of USRP project
4. Ministry of Communications and Transport	E.S. Wapalilo	Senior Transport Economist
5. Ministry of Agriculture and Coopeatives	Masenza A.L. Simkanga B. D.M.K. Kogan	Irrigation Engineer Environment Engineer Livestock Development Officer
7. Fisheries Division	G. L. Kasikela Sadock Kimaro	Senior Fisheries Officer Fisheries Assistant Director
8. National Land Use Planning Commission	J. Shilungushela	Senior Landuse Planning Officer
9. University of Dar es Salaam		Marine Biology
10. UNDP	D. Kahatano	Programme Officer
11. TaTEDO	Gisele Ngoo	Programme Officer
12. World Wildlife Fund for Nature	Peter Sumbi	Senior Forestry officer
13. WCS (Wildlife Conservation Society Tanzania		
14. JET(NGO)	Francis Nyange	Executive Secretary
15. KBO	Rwakabare	Commissioner
16. AGENDA	John Katima	Prof. University of Dar es Salaam
17. Green Shinyanga Group (NGO)	R. E. Kimaro	Executive Secretary
18. Mwanza Environment and Conservation of Nature	G. C. Masota	Executive Secretary
19. Lake Victoria Environment Management Programme	D.K. Rutagemwa on behalf of S. Mbwana	Scientist
20. HESAWA		Executive Secretary

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