LAKE VICTORIA ENVIRONMENTAL MANAGEMENT PROJECT (LVEMP)

ECONOMIC DEVELOPMENT: NATURAL RESOURCES INTERVENTIONS / INVESTMENTS COMPONENT

FINAL REPORT

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PREFACE

LAKE VICTORIA BASIN VISION[1]"

The development of the Lake Victoria Basin Natural Resources underpinned by the need to support a Prosperous Population living in a Healthy and Sustainably Managed Environment and providing means to ensure Equitable opportunities and Benefits

[1] Adapted from the LVEMP Secretariat's official "Vision"

LAKE VICTORIA BASIN CATCHMENT MAP

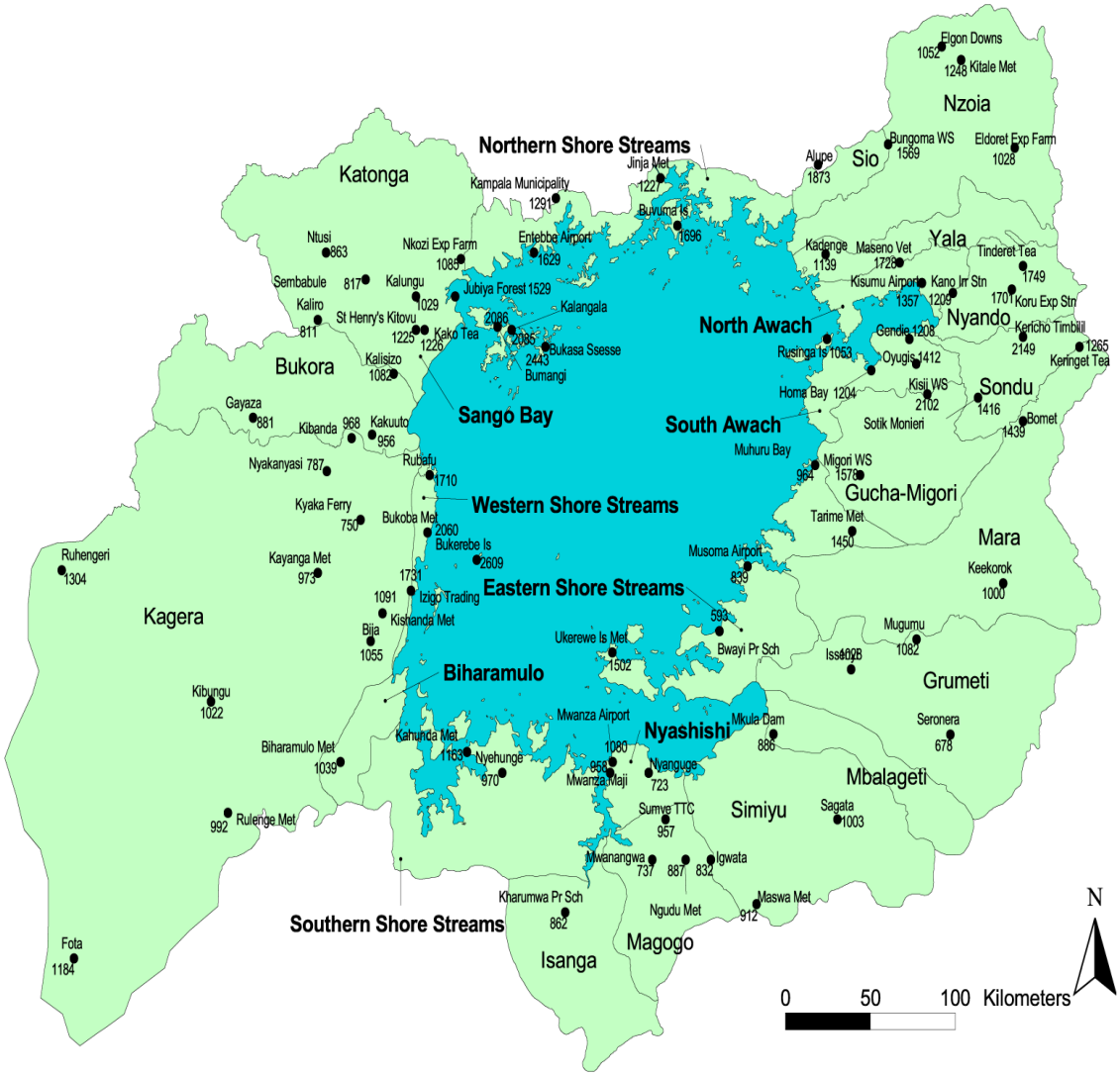

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

AMFIU	:	Association of Micro Finance Institutions in Uganda
ASCA	:	Accumulating Savings and Credit Associations
ATM	:	Automated Teller Machine
BoU	:	Bank of Uganda
CDD	:	Community Driven Development
CBD	:	Community Based Development
CBO	:	Community Based Organization
CERUDEB	:	Centenary Rural Development Bank
CGAP	:	Consultative Group to Assist the Poorest
CMFL	:	Commercial Micro Finance Limited
DCI	:	Development Consultants International Limited
EADS	:	East Africa Development Strategy
EADS	:	East Africa Development Services
EAC	:	East Africa Community
EIA	:	Environment Impact Assessment
ERR	:	Economic Rate of Return
FEW's	:	Financial Extension Workers
FINCA	:	Foundation for International Community Assistance
FSA	:	Financial Services Association
FGD	:	Focused Group Discussions
IRR	:	Internal Rate of Return
LVB	:	Lake Victoria Basin
LVFO	:	Lake Victoria Fisheries Organization
LVEMP	:	Lake Victoria Environmental Management Project
MFI's	:	Micro finance Institutions
MDI	:	Micro Deposit Taking Institution
MFF	:	Micro Finance Forum
MIS	:	Management Information System
MOFPED	:	Ministry of Finance Planning and Economic Development
MOP	:	Micro finance out reach Program
MFI	:	Micro Finance Institution
MSCL	:	Micro Finance Support Centre Limited
NBI	:	Nile Basin Initiative
NEAP	:	National Environmental Action Plan
NPV	:	Net Present Value
NGO	:	Non Government Organization
PBP	:	Pay Back Period
PAP	:	Programme for the Alleviation of Poverty
PEAP	:	Poverty Eradication Action Plan
ROSCA	:	Rotational Savings and Credit Association
RFI	:	Rural Finance Intermediary
SEA	:	Strategic Environment Assessment
SME	:	Small and Medium Enterprises
SWOT	:	Strengths, Weakness Opportunities and Threat
SACCO	:	Savings and Credit Cooperative
SEDA	:	Small Enterprise Agency
ToR	:	Terms of Reference
YES	:	Youth Enterprise Scheme

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We recognize the kind assistance received from District Administration head Offices and lower local government units; Beach Management Units and the local government Technical Staff met during field visits. Their explanations and information availed to the consultants were extremely useful in processing this report.

The consultants recognize with thanks the assistance obtained from the Secretariat of Lake Victoria Environmental Management Project (LVEMP), Entebbe including discussions, guidance, relevant publications and all other support as needed. We recognize and thank the Task Team members for their guidance and inputs when the consultants met them individually in their offices and collectively at LVEMP Secretariat. We appreciate and recognize all the assistance received which greatly assisted in processing this report. We are of course entirely responsible for any shortcomings as may be discerned in this report.

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EXECUTIVE SUMMARY

Introduction

This study has underscored the imperative obligation especially on the part of the riparian states Kenya, Uganda and Tanzania to develop the abundant natural resources in the LVB and its extensive catchment to realize the potential income generation and employment benefits to reduce poverty in the basin and protect the ecosystem.

For several decades, cumulative environmental degradation largely associated with human activities (industrial and urban effluence from the bordering towns and cities of Lake Victoria), run off rain water and diminishing oxygen in the lake have negatively affected the lake's ecosystem and reduced its natural resource base especially the fish stocks and certain plants resulting from diminishing size of wetlands and receding shores of the lake.

To reverse Cumulative negative effect of decades of environmental degradation, the riparian states initiated in 1992 a multidisciplinary, multisectoral regional development programme. This has marked a major development initiative in the history of LVB. The commissioning of Lake Victoria Environmental management Project LVEMP I in 1997, the reestablishment of East African Community (EAC) in 1999 and subsequent Lake Victoria Basin Commission (LVBC) in 2003 have strongly internalized and consolidated the primary objectives of LVEMP I viz.: to transform LVB and its catchment into a socio-economic growth zone.

Lake Victoria Basin (LVB) Natural Resources

LVB has varied natural resources both terrestrial (land based) and aquatic (water based). These include fertile soils on one hand and on the other fresh water of the lake; the phytoplankton and invertebrates resources; wetlands; fisheries and aquatic resources as well as wild life, forestry, ecotourism and Hydro power resources. These resources underly the sectoral resource base for investment interventions under Agriculture, Forestry, Soil resources; Fisheries; Water; Wetlands; Wild life; Energy; Minerals; Transport and Communication infrastructure, and eco-tourism.

Purpose and scope of the study

This study has reviewed and assessed the potential of natural resources interventions/ investments in lake Victoria Basin in the context of the following specific objectives:

- Identification of short and long term priority interventions and investments in LVB. This is mapped out in chapter four community driven development and chapter five outlining sectoral opportunities for environment interventions and investments.
- The establishment of investment fund to support sustainable investment activities with particular focus at the community level and this is examined in detail in chapters three, four and five respectively.
- Assessing environmental impact and legislation capacity in the country. These aspects are highlighted especially in chapters three, four, five and seven.

This study has in particular reviewed the selected areas of interventions under LVEMP I, identified the gaps and lessons learnt during the implementation of LVEMP I Intervention. The critical natural resource areas for addition interventions and investments under LVEMP II have been elaborated. In this regard, detailed sectoral intervention/investment is consolidated in chapter five and annexes three and four respectively on the project logframe and project indicative budget.

Lessons Learnt from LVEMP1

The implementation of LVEMP1 involved modern planning practices and sustainable use of natural resources, taking into account the need to satisfy short term and long term development requirements of the communities in the lake basin. This involved the communities to be sensitized about their responsibilities to:

- Acquisition of appropriate skills to protect natural resources and the environment.
- Harmonized national and regional management procedures in order to achieve the maximum extent possible, the reversal of environmental degradation.
- Promotion of regional cooperation among the partner states (sharing information on the use of transboundary resources).

Comprehensive information on the LVB environment and its catchment is thus critical for policy interventions. In this context, capacity building and institutional strengthening under LVEMP1 has been very beneficial. Actual activities that encompassed the implementation of LVEMP1 are elaborated in Annex 1. Identified gaps during LVEMP I implementation include required interventions/investments in catchments Afforestation; land use management; wet land management; continued monitoring and control of water hyacinth and capacity building at Sectoral and community level.

Natural resources based economy.

The current heavy dependence of the economy on agriculture and other natural resource based activities is highlighted. For instance, direct benefits from forest and woodland resources; non-forest plant resources; wildlife and inland system contribute to GDP an estimated US$ 411.5 million a year. This value is probably underestimated. In addition some 96% of the LVB population live in the rural areas with 85% directly dependent on agriculture for their livelihood and employment.

The report underscores the imperative obligation to use the natural resources without compromising the needs of future generation to meet their own needs. Since the Rio Earth Summit in 1992, Uganda government has installed a number of public administration instruments, strategies and plans to ensure internalization of best Practices in sustainable exploitation of natural resources. In chapter three on the field findings, it is revealed that for the districts in LVB visited, their livelihoods are largely subsistence based in all major sectors and their awareness of best practices in the use and management of natural resources under local ownership or possession is limited.

The implementation of decentralization policy has devolved substantial administrative, power to the Districts and lower levels so that under this arrangement local communities are greatly empowered to influence resource use decisions. The severe limitations in this regard as noted in chapter three and relate to persistent lack of funds, lack of trained and experienced staff and appropriate knowledge and technology regarding available markets; profitable opportunities and so on. In this regard, central government institutions like NAADS, PMA and LVFO continue to play vital roles in guiding LVB population exploit available natural resources. The existing interventions and investment opportunities in major sectors as well as major constraints are highlighted in chapters three and four.

Future Lake Victoria Basin Development Strategy

It is noted that the diverse resources of the basin are a strong bond between Kenya, Uganda and Tanzania. There is therefore urgent need to ensure under LVEMP II, that efforts to attain improved management of LVB natural resources are coordinated to minimize duplication, overlap and wastage. The analysis of community driven development in Chapter four envisages efficient exploitation of Lake Victoria natural resources as a prerequisite to achieve the objectives of major public policy measures as for instance the PEAP and PMA. In this context, the role of community based approach are recognized as major factors in assuring realization of intended objectives i.e. efficient use and protection of natural resources (both land and water based). Risks to community driven development include lack of capacity to implement existing laws and regulations on the use of natural resources; lack of funds, unharmonized national laws etc. are elaborated in chapter four.

Under the East Africa Development Strategy, Lake Victoria basin known for its immense socio- economic potential and ecological values has been designated a "Regional Economic Growth Zone" to be exploited jointly to maximize economic and social benefits while ensuring management and protection of the environment. To date, the protocol for the sustainable management of the LVB and for establishing a regional body "the Lake Victoria Basin Commission" has been instituted.

Critical Issues and Priority Investment Areas

The overall analysis of this report reveals a state of environment in the lake basin that is still subject to severe environment degradation. Desired rigor in implementing effective environment management policies especially to control continuous deterioration of the water quality is considered imperative. This arises from expanding human settlements in the lake basin; volumes of urban and industrial wastes as well as the encroachment on the basin wetlands, watersheds and forests, among others. These are real threats to the LVB ecosystem and severely compromises economic growth potential for the LVB.

Critical Issues

The following critical issues are highlighted in the report:

- Persistence of poverty in the LVB
- Urgent need to reverse and control high levels of environmental degradation of water based and land based natural resources in the LVB
- Urgent need to transform the LVB subsistence economy into a market economy through implementation of appropriate development policies and use of modern production technologies.
- Harmonization and implementation of environment laws and procedures to especially protect sustainable use of transboundary resources.

Investment priorities highlighted in this report cover all the major sectors as shown in the detailed budget annex 2. These are broadly summarized below.

- Sensitization and public awareness. It is considered critical for the LVB communities to be made aware on continous basis of the imperative dangers of overusing the basin natural resources; appropriate resource use practices and implementation of legal

instruments to ensure sustainable use of LVB resources underly required interventions. Generation of data and information about these aspects is to be continued from LVEMP I.

- Capacity building. This is considered critical both for the basin communities and service providers i.e. private sector operatives, NGOs and CBOs as well as Local Government officials.
- Other investments embrace: varieties of inputs (seeds and seedlings; feeds); equipment; physical and marketing infrastructures and advisory services.
- Credit; lack of financing is a major constraint especially among poor communities. The establishment of investment fund for the LVB is therefore expected to be of valuable assistance in this regard. Initially, the investment fund will concentrate on financing projects from widows, school leavers, HIV/AIDS victims; abandoned youths; and the like. The project will be demand driven but characteristics of eligible projects will emerge during actual assistance requests and processing.

Proposed Budget LVEMP 2

The proposed budget for LVEMP 2 Economic Development National Resources Interventions / Investment component amounts to USD $ 15.0 million. The Sectoral allocation, with the exception of a proposed investment fund that accounts for 26.7 % of amounts available, are concentrated on agriculture, fisheries, community driven development and communication and transport. Investments in these sectors are intended to transform current LVB subsistence production to more rewarding market economy.

The allocation of USD $ 4.0 million to the investment fund will avail limited credits and subsidies for the feasibility studies for the benefit of the disadvantaged and poor groups in the lake basin communities. Table 8.2, summary of Sectoral allocation LVEMP 2 Budget and Chart 8.1, Relative Sectoral Distribution of LVEMP 2 Budget outlines how LVEMP 2 budget of USD $ 15.0 million has been allocated.

1.0 BACKGROUND

1.1 Introduction

This study on natural resources interventions/investments in the Lake Victoria Basin (LVB) is one of a number of studies that have been commissioned by the Lake Victoria Environment Management Project (LVEMP) secretariat. These studies seek to inform how the abundant natural resources in the LVB and its extensive catchment can be sustainably and economically developed to among several expected benefits, reduce high poverty levels of the population in the lake Basin and protect the LVB eco-system.

Existing and abundant literature, particularly varieties of scientific reporting, underscore the vast natural resource endowments of the LVB, inclusive of the fresh waters of the Lake; rich agricultural soils; abundant rainfall; significant mineral deposits; ecological diversity embracing dense forests, wildlife and all of which provide unique opportunities not only to promote profitable eco-tourism in the basin and its extensive catchment but also promotion of several other natural resource based investments.

Lake Victoria, shared by the partner states Kenya, Tanzania and Uganda respectively in the proportion of 6%, 49 % and 45 % has a surface area of some 68,800 km^2 and an adjoining catchment of 184,000 km^2, is the second largest body of fresh water in the world, second to Lake superior, and is the largest in the developing world. Lake Victoria is however; relatively shallow with a maximum depth of about 80 metres and an average depth of about 40 metres.

Available records indicate that the bulk of the volume of water of the Lake Victoria is due directly to precipitation on the lake and the reminder coming from the rivers which drain the lake basin catchment. River Kagera, is the most important of these rivers contributing about 7% of the total inflow of water to the lake. About 85% of Lake Victoria water loss is through direct evaporation from the surface of the lake. The remaining 15% represents an outflow of water via the Nalubale and Kiira dams into the River Nile.

The waters of Lake Victoria inclusive of the rivers and tributaries that feed it and other inland lakes of its extensive catchment encompass an area vastly rich in biodiversity not only in fish stock but also other species. As a result, the catchment attracts international interest and protection being under the status of international heritage and privileged to secure financial support from the Global Environment Fund.

Since 1960s, however, Lake Victoria and its shores have experienced, cumulatively, increasing environmental degradation mainly arising from rapidly expanding human population in the basin; increased urban effluent; industrial waste and runoff rain water that convey huge wastes to the Lake and block the wetlands.

For several decades, these polluting and degrading environmental conditions accounted for the increased inflows of nutrients into the Lake and explain the subsequent decline in the quality of the Lake waters and the deoxygenation process. Additional negative effects of poor environmental conditions have embraced increased water borne diseases for humans and animals that depend on the Lake water, clogging of water filters and high costs of urban water treatment and purification plants. Several scientific research papers on the environmental state of Lake Victoria indicate that the continued process of deoxygenation of its bottom waters poses constant threat to the Lake's biodiversity eliminating completely certain types of fish species. The increased loads of nutrients create favourable conditions for the rapid spread of water hyacinth infestation.

It was, therefore, against the urgent need to reverse the detrimental environmental developments in the Lake Victoria Basin that the collaborative efforts of the riparian countries Kenya, Tanzania and Uganda collaborated in conceiving, promoting and effectively implementing a multidisciplinary and multisectoral regional development project realized between 1992 and 1997 marked a major event in the history of LVB. This is especially the case for the riparian fishing and wetland dependant communities of the Lake Basin.

At this juncture, it could be pointed out that the reestablishment of the East Africa Community in 1999 and the subsequent creation of Lake Victoria Basin Commission (LVBC) in 2003 strongly internalized and consolidated the primary objectives of the Lake Victoria environmental development programme.

1.2 Lake Victoria Basin Natural Resources and development potential

The Lake Victoria Basin is vastly endowed with varieties of natural resources which await judicious exploitation. These can be grouped into two large categories: the land-based natural resources and the water-based natural resources.

1.3 Land: land tenure systems and soils

The way natural resources are exploited or utilized depends very much on the existing land tenure systems. In Uganda, the land tenure systems have evolved in several ways. Before colonization, the land tenure systems varied from one ethnic group to another. In Buganda for instance, although the Kabaka as a titular head of the kingdom held the land in trust for the entire people, the real power over land matters, however, was in the hands of the clan leaders, or the Bataka. In other inter-lacustrine

kingdoms of Bunyoro, Tooro, Ankole and Busoga, land was owned communally, and security of tenancy was guaranteed as long as the owner of the kibanja resided there. Powerful chiefs were in charge of their respective lands. In Acholi and other non-kingdom areas, land is communally owned, albeit with the oversight of the chief of the area. In pastoral communities, land is also communally owned, and its use is governed by rules that are enforced by a council of elders, especially in the utilization of pasture and water

The advent of colonialism to an extent influenced some change in the land tenure system. The current land tenure system is a product of the 1900 Buganda Agreement and other agreements that followed, as well as amalgams of the different and evolving communal land tenure systems. Taking into consideration the above historical factors, the Uganda Constitution (1995) Article 237 states that land in Uganda belongs to the citizens of Uganda and is vested in them in accordance with the following land tenure systems: mailo, customary, leasehold and freehold.

Mailo land tenure

The 1900 Buganda Agreement and others that followed in Tooro and Ankole resulted in the division of land among the Kabaka, the chiefs and Protectorate Government. A total of 47,730 sq km in Buganda was subdivided into mailo.

Customary land tenure

This is the most dominant and widespread system in the LVB in Uganda, where rights are regulated by custom, especially in Busoga region comprising districts of Jinja, Iganga, Kamuli, and Bugiri.

Freehold land tenure

Under this system, a private individual or organization, just like the case with mailo land, owns the land.

Leasehold land tenure

Under this system, there is an agreement between the lessor (Government) and the lessee (the developer). After independence, all the land that had not been given out as mailo or freehold, and had remained under the control of the Protectorate Government as Crown land, as well as the land that was originally referred to as the Kabaka's official mailo land, were converted into public land and entrusted to the Uganda Land Commission. Under the 1995 Uganda Constitution, this land is now managed by the Land Boards established in each district throughout the country.

Given the above rather complex land tenure system that exists in Uganda, the quality and speed with which land is availed to a potential investor is a function of the law governing the above land tenure systems currently operating in LVB on the Uganda side. There are some claims and observations that this complex land tenure system has to be reformed especially to promote and encouraged better land management in the LVB catchment. The National Land Policy and Land Use Policy is expected to address these concerns.

The soils

These are deep red-clay soils, porous with stable structure. They are also fertile soils and support a wide range of crops. The Plinthosils are found in low-lying areas in valley bottoms with fluctuating water table. They have high aluminum content with over 80% of it being ferrous oxides. There are soils in the swamps (vertisols), which predominate in wetlands. Greysols occur in depressions along river valleys. The diversity in soil composition implies also diversity in agro-ecological zones, which range from forests in mountainous/hilly areas through intensely cultivated areas down to the lowlands around the lake. Population pressure has resulted in intensified land use, exacerbated by prevailing land tenure system. There is inadequate terracing of steep farmlands, resulting in severe topsoil erosion. In the lowlands, soils are of clay origin, sticky and liable to crack in the dry season. These soils, however, support sugar cane and cotton enterprises besides food crops and livestock enterprises.

Due to their diversity, these soils can be used to generate wealth. What is needed is proper soil zoning and utilisation which will enable each area to grow suitable crops of great diversity, of exportable value added commodities for both the EAC market and overseas. The policies of the Partner States have been geared towards utilizing the soil resources in LVB to attain food self-sufficiency. There is great potential for the soil resources to generate wealth through diversification into export-oriented production in the region. The region has a competitive advantage of being able to grow crops throughout the year, hence able to export produce to temperate countries in winter.

1.4 Water-based natural resources

The water based natural resources covered in this study include those of Lake Victoria area in Uganda and the catchment districts of: Kabale, Ntungamo, Bushenyi, Mbarara, Rakai, Mpigi, Kampala, Jinja, Mukono, Iganga, Bugiri, Busia, Kalangala, Wakiso, Kyenjojo and Masaka. It is to be noted that the usefulness of the water resources is dependant on their quality, quantity; and availability.

Historically, Lake Victoria shores has been fringed by extensive papyrus (*Cyprus papyrus)* dominated by wetlands, and dense forest patches of tropical rain forest characteristic of many of the islands. Much of the forest cover has been degraded through increasing population and poor land management practices. As a result, the diverse multi-species commercial fishery has been reduced to basically three species – Nile perch (*Lates niloticus),* Nile tilapia (*Oreochromis niloticus)* and Dagaa/Mukene (*Raastrineobola urgentea).* Two of these species are alien to the lake basin. These changes, together with the decline in water quality and quantity are cause for concern

regarding sustainability of the lake fish, probably the most important resource from Lake Victoria

The existing water resources in Lake Victoria are used for both domestic and commercial purposes. The municipal area on the lakeshore use water from the lake. Sugar cane plantations and flower farms draw their water for irrigation from the lake. At the same time, communities living by the lake suffer from drought, unable to utilize the lake water to increase the crop production and improve their living standards. There are several potential areas of wealth creation through the use of lake water for production.

Water quality and quantity in LVB

A recent Integrated Water Quality and Quantity Synthesis report for LVEMP phase one provided vital information about the meteorological and hydrological events in the catchments of Lake Victoria over the past 50 years. The discharge of rivers and streams draining the catchments shows that river Kagera, which drains the lake catchments of Burundi, Rwanda, Tanzania and Uganda, had by far the largest long-term discharge. However, most of the water input into Lake Victoria (82%) is realized from rainfall on the lake surface. The contribution of the run-off from the terrestrial catchments is about 18 percent. The water loss from the lake via evaporation is about 85% and about 15% due to outflow of water through Owen Falls all the way to the White Nile. This water sustains many activities as will be seen later.

The underlying causes of water quality deterioration include:

- Poor land use practices, both crop and livestock, which lead to soil erosion, wrong application of fertilizers, herbicides and pesticides, excessive clearing and conversion of wetlands buffers and fringing forest cover. These activities promote siltation and enrichment of the lake ecosystem with nutrients and pollutants from the catchments.
- General run-off from urban centres and lakeside settlements, release of raw or insufficiently treated municipal sewage and industrial effluents.
- Atmospheric deposition is one of the most important sources of phosphorus and nitrogen of total loads entering LVB ecosystem. The sources of the nutrients in atmospheric deposition are diverse, many originate distant or nearby locations. The management of these nutrient sources, therefore, calls for strong collaboration of the riparian countries.

When excess nutrients, especially nitrogen and phosphorus are released in the lake, this results in **eutrophication,** i.e. the alteration of production characteristics in aquatic ecosystems due to enrichment, particularly with nitrogen and phosphorus. The changes are the consequences of excessive growth of phytoplankton or macrophytes,

which as they decompose, impair water quality resulting in low dissolved oxygen, high turbidity, and production of toxic gases such as hydrogen sulphide.

Those changes lead to the proliferation of the most robust species of phytoplankton and /or macrophytes at the expense of the more sensitive ones. Eutrophication may affect the ecology and productivity of the entire ecosystem through competitive interactions and changing trophic regimes. Eutrophication, however, is not pronounced over most of the deep open lake. Cynophyceae, the most prolific types of algae in eutrophic environment were, however, the dominant phytoplankton taxa lake-wide. Could this indicate early stages of eutrophication even in open Lake Victoria? **Research is urgently needed to answer this question.**

Phytoplankton

Phytoplankton (algae) is the most important primary producer in Lake Victoria and hence a vital basis for higher production, including that of fish. Phytoplankton is therefore one of the basic water resources in Lake Victoria ecosystem. Phytoplankton is probably the first living aquatic resource to manifest the effects of eutrophication. This is why eutrophication is considered potentially destructive to the ecology of the entire aquatic ecosystems.

Studies on phytoplankton diversity in Lake Victoria are relatively few and limited to the near shore zones. So far the studies have demonstrated the dominance of blue green algae (*Cynophyceae)* over diatoms (*Bacillariophyceae)* and green algae (*Chlorophyceae)*, the least abundant. The studies have shown the increase of phytoplankton biomass by a factor of three to five, since the 1960s and consequently the tendency to nutrient limitation of phytoplankton particularly by nitrogen in near-shore environment of the lake, and the occurrence of serious oxygen deficits accompanied by massive fish kills, the consequences of serious eutrophication.

High proliferation and total dominance of blue green algae (*Cynophyceae)* has been confirmed in the near-shore zones of the lake, especially in bays associated with large settlements and industrial establishments, e.g. Kampala and Jinja.

Invertebrate

Aquatic invertebrates (animals without backbones) are constituted by zooplankton, which reside mostly within the water columns and macro invertebrates (macro-benthos) associated mainly with benthic debris and the under-water part of aquatic plants. Invertebrates are a vital resource in aquatic ecosystems. In Lake Victoria, zooplankton is a major dietary component of the early life of most young fishes. Some fish, e.g. Dagaa/Mukene (*Rastrineobola urgentia)* feed almost exclusively on zooplankton. Further, many zooplankton taxa are algal grazers, i.e. they graze on algae and thereby constitute a vital link between primary and higher production along the grazer food chains. Macro-invertebrates, which convert detritus and are consumed

by higher organisms, especially fish (e.g. Dagaa / Mukene, Nile perch and Nile tilapia) play a similar role along the detritus food chain. Occurrence of particular invertebrates may provide a biological indication on the environmental health of a given system. Some of these macro-invertebrates may be used as biological indicators of environmental degradation.

In view of trophic interdependence in natural ecosystems, elimination of organisms from the food web would lead **to interrupted food chains or** a change in food habits for organisms with that flexibility and ability to cope with the new situation. It is, for example, thought that the marked decline in the proportion of diatoms in the phytoplankton of Lake Victoria contributed to the disappearance of the indigenous tilapiine (*Oreochromis esculentus}* from the lake. **This is an area that needs in-depth research.**

Wetland

To start with, it is important to note that all wetlands on Ugandan side of LVB have been identified, inventoried and data integrated into the National Wetland Information System. The area has been also mapped using base maps and satellite images and further ground truthed to give names and exact locations of the wetlands.

Wetland resources in Lake Victoria are defined to include flood plains and fringing large plants often dominated by papyrus (*Cyperus papyrus)* or *Miscunthus.* The definition of wetlands also includes the shallow near-shore zone of the lake up to 3 metres deep. This zone supported or has the potential to support rooted and/or floating macrophytes. The two categories of wetlands constitute very important resources in several aspects. The emergent wetlands of Lake Victoria regulate the flow of water through their spongy underwater biomass and in the process contribute to water conservation, flood reticulation and water purification. The wetlands also strip and retain incoming sediments and nutrients from the catchments, contribute to climate modification through evapo-transpiration and act as habitats for biodiversity, including the rare Sitatunga, shoe-bill, the crested crane and the swap warblers. Emergent wetlands plants, e.g. papyrus, provide materials traditionally used for various purposes including thatching, mat and basket making.

Fishery resources

It is estimated that the annual fish catch from Lake Victoria is about 500,000 tonnes, generating between US$ 300-400 million annually. There are upto 17 fish processing plants in Uganda. In the past, fishery in the lake once drew on hundreds of species, mostly endemic, now rests on only three namely, a native pelagic minnow (Dagaa/Mukene), Nile perch and Nile tilapia.

The fishery resources of the lake have a high historical value as a source of protein and employment opportunities, especially for the lakeside communities. Nile perch is a vital foreign exchange earner internationally while other fisheries have ready regional markets. Nile perch dominated fisheries in Lake Victoria since 1980s. Between 1997 and 2000 the contribution of Nile perch to the total catch averaged 85% by weight in a fishery estimated to yield a total annual catch of 200,000 to 250,000 tones. This is a major fishery resource that should be managed sustainably.

The Nile perch is heavily over fished as indicated by the high proportions (70% of the catch by weight) of immature fish and a reduction in the size at first maturity since the early 1990s. In addition to excessive fishing pressure using illegal and destructive fishing gears, especially undersized gillnets and beach seines. The fisheries of the lake is increasingly adversely affected by environmental degradation caused by eutrophication caused by inflow of nutrients rich in nitrogen and phosphorus coming from industries and untreated or insufficiently treated municipal waste.

The Nile tilapia is exclusively near-shore, confined to waters up to 20 metres deep. It is an opportunistic feeder, changed from a diet dominated by algae in the 1980s, to an omnivorous one, which includes the prawn *C. nilotica*, fish, algae and higher plant material. The Nile tilapia fishery is third in importance in the lake, and the species is also over fished as indicated by the reduction in size at maturity.

In Uganda, 96% of the total fish catch of 212,000 tons in 1999 was Nile perch, with 49% of this total catch coming from Lake Victoria. In 1999, there were 597 Landing sites with 34,927 fishermen. Fishing craft numbered 15,582 (LVFO, 2001). As peer policy, Uganda wishes to limit exports of Nile perch to 60,000 tonnes live weight per year. In theory, this would be achieved by giving a maximum raw material quota in licence to processing firms. The quota, however, may be difficult to control.

Dagaa is the main truly pelagic fish in Lake Victoria. Its fishery is the second largest after the Nile perch. Dagaa is similarly over fished and size at first maturity was found to have declined from 44mm to 38mm TL.

At the current exploitation of the fish resources, it should not come as a surprise if within a few years the lake is empty of mature fish. Secondly, with environmental degradation occasioned by the inflow of untreated or insufficiently treated sewage and waste from urban centres and industry, the productivity of the lake is continuously reduced due to eutrophication. The lake continues to have open access regarding fishing activities and this entails lack of adequate control.

Other aquatic resources in Lake Victoria ecosystems include migratory and resident birds, large mammals (hippo) and small mammals (otter) as well as reptiles (crocodile, monitor lizard and snakes) and amphibians. Birds are probably the most

studied in this group of aquatic resources. For example, 30 Important Bird Areas (IBA) have been designated in the Uganda portion of the lake, while 70 were identified in Kenya. Birds in the IBA are studied and monitored as part of a management process. All the above resources play an important role in the food chain and as biological indicators of ecosystem health in the land-water ecotones of Lake Victoria.

1.5 Wildlife and Tourism

Wildlife resources exist in protected area of Rakai, Mpigi and Busia Districts. Rakai District fauna founds at the Sango Bay reserves include 119 species of forest birds that constitute 38% of Uganda's total forest birds, six species of diurnal forest primates accounting for 50% of the country's diurnal forest primates, and 45 species of forest swallowtail butterfly constituting 66% of the country's forest swallowtail butterfly. In addition, the Doggetti species of Blue monkey *(Cercopithecus mitis)* occurs at Sango as part of a limited range in southwestern Uganda, and two subspecies of butterfly are known to occur in this locality. This presents great potential for faunal and flora attractions to the LVB.

Trade In wild species is only recently regulated, and already several licence holders exist, trading in snakes, reptiles (tortoise, cameleons) among others. These are as well involved in sustainable breeding programs. In Uganda, the LVB offers many tourist attractions such as water sports, bird watching, sport fishing, forest walks, sun bathing and other natural attractions. Apart from Government contribution, the private sector has taken great initiatives in strategic activities in the industry, including increased hotel accommodation, providing travel and tour operations, professional tour guiding, tourism promotion, capacity building and linking with collaborating and supporting institutions.

1.6 Hydropower and other energy sources

The total hydropower generation in Uganda increased from 1,130 million Kwh in 1999 to 1,341 million Kwh in 2000 after the extension (now Kiira) of the Owen Falls dam (now Nalubaale) at Jinja. The LVB has various hydro power potential sites, including Rwizi in Mbarara (0.5 MW), Nshungenzi in Mbarara (20 MW), Kikagati in Mbarara (20MW).

The LVB also enjoys proximity to the hydropower potential on the Nile dependent on the lake Victoria outflows including the existing 180MW at Nalubale, 120 MW at Kiira, the proposed 250 MW at Bujagali, 450 MW at Kalagala, 200 MW at Karuma, 500 MW at Ayago, 600MW at Murchison Falls. Protection of Water resources in the Lake Basin is therefore crucial. It is noted that the proposed new power investments are yet to be implemented; this in part explains the current power crisis in Uganda.

Biomass accounts for well over 90% of the energy consumed in LVB. Sugar factories produce large quantities of waste bagasse, which can be converted into energy. Kakira Sugar Works has signed a contract with Government to co-generate 8MW from bagasse and hook it onto the national power grid. With so much municipal waste available, this could be turned into electricity through gasification process. This area could be explored and replicated on a large scale nationwide. Water hyacinth, which is a problem on the lake, could be used for production of biogas. This is already in operation at Luzira Prison, Kampala.

1.7 Mineral Resources

On the Uganda LVB, there are mineral resources that include gold in Busia district, where mining now takes place. Non-metallic minerals in Busia include clay soils, marble, granite and silica. These exist at Dimo, Bukakota, Nalurundi and Nyimu along the shores of Lake Victoria and on the islands of Buvuma and Kome. Sukulu in Tororo has huge proven rock phosphate deposits. All these await further exploration to assess their quality, quantity and profitability, while others require heavy capital investment and expertise. For example, Sukulu phosphate deposits are proven. Of significance is an agreement with the railways systems in Kenya and Uganda to transport the bulky phosphate fertiliser to overseas markets after other byproducts, which include sulphuric and phosphoric acids have been extracted.

1.8 Forestry Resources

Forests play an important role in the preservation of catchments, soil conservation and in stabilizing micro-climatic conditions. They also provide natural habitats for wildlife and conserve biodiversity. The main products are timber, charcoal, fuel wood, medicinal herbs, wild berries, fruits and mushrooms together with other natural fibres for handicrafts such as cane chairs, drums, carvings and building materials. There has been serious degradation of the forest cover, with the supply of timber in the next 5 years threatened. To reverse this trend, the following measures merit serious consideration:

- Involvement of local communities in the management of forest resources. The three Partner States have made initial steps in this direction, but a more vigorous approach is required.

- Involvement of individual investors or companies in planting trees either on their own land or leased land. The National Forest Authority (NFA) in Uganda has embarked on this enterprise.

- Higher (tertiary) institutions to be leased forests by NFA to manage or to plant trees on their or leased land.

- Where possible, schools should spare land to plant trees and woodlots as part of national afforestation programme. This would also inculcate in young persons love for trees and forests.

- Encouraging setting up of Forest/Tree Clubs in schools, communities and other areas where people have space to plant trees which, later one, will yield some income;

- Establishment of nurseries for each subcounty in the LVB to facilitate community tree planting;

- Uganda has many steep and bare hills in LVB, especially in Ntungamo and Rakai that need to be planted with trees.

1.9 Lessons Learnt From LVEMP 1

Purpose of LVEMP1

LVEMP1 established through a tripartite agreement of 5th August 1994 was a comprehensive program implemented in Kenya, Tanzania and Uganda to rehabilitate the Lake Victoria ecosystem for the benefit of about 30 million people who live in the LVB catchment. The national economies of the three riparian countries and the interests of the global community are equally addressed.

Besides the social and economic interests of the population in the Lake Basin and catchment, the programme addressed the major threats facing the lake and its catchment including: decline in biodiversity and apparent disappearance of vital species, deteriorating water quality, poor land use practices, increased discharge of effluent into the lake, misuse and distraction of wetlands and the invasion of water hyacinth.

Objectives of LVEMP 1

The project was conceived and formulated to restore a healthy and varied ecosystem of the lake to ensure environmental stability to be able to support in a sustainable way the socio economic activities in the lake and its catchment. Among the main objectives of the project was the imperative need to generate information required to enhance rational management and utilization of the lake basin resources.

Comprehensive information on the environmental status of Lake Victoria and its catchment both at the national and sub-regional level is critical particularly to enhance formulation and execution of effective socio-economic and environmental policy instruments and interventions. In this context, certain activities like capacity building and institutional strengthening under LVEMP1 have been exceedingly useful.

LVEMP I Implementation

The implementation of the Lake Victoria Environmental Project first phase (LVEMP1) was jointly carried out by the Governments of Kenya, Tanzania and Uganda. As mentioned earlier, the project embraced scientific, socio-economic and environmental benefits for both, the riparian and the global communities. Apart from the contributions made by Kenya, Tanzania and Uganda, the bulk of the funds were contributed by the Global Environmental Facility (GEF) Trust Fund and the International Development Association (IDA), combining to mobilize in all US $ 77.6 Million.

The overall coordination of implementing the project components have been through the LVEMP Secretariat with MDAs in each riparian country constituting the focal points under which respective country components were implemented, monitored and evaluated.

Thus a regional policy and steering committee made up of representatives from the equivalent national committees provided the coordination and policy guidance in the execution of LVEMP1. This committee liaised the regional aspects of the project with each riparian country and with the Secretariat of East African Cooperation for political guidance. At the country level, the implementing agencies worked closely with the District Authorities, local stakeholders and the beneficiary rural communities.

Given the multi-sectoral nature of LVEMP1componebts, their implementation involved ministries as focal points, government agencies and parastatals.

These included:

- Ministry of Water, Lands and Environment (MWLE). This Ministry was the lead focal point with the following LVEMP1 implementing agencies:

    - *Water Resources Management Department (WRMD).* Was responsible for implementing the water quality management component. This involves continuous measure and verification of eutrophication and sedimentation levels in water samples; check the pattern of inflow dispersal in the lake and collect environmental data that to be used to formulate models for water quality management.

    - *Forestry Department:* This department was responsible for implementing the catchment afforestation component. This involved production of tree seedlings, tree planting and conservation of the natural forestry reserves. The department worked closely with the WRMD, NGOs and local communities.

- *Wetland Inspection Division:* This division was to ensure, among other functions and duties, sustainable use of existing wetlands and to conserve the buffering capacity of wetlands along the lake shore. These responsibilities were carried out in close collaboration with local communities and the NGOs.

- *National Water and Sewerage Corporation (NMSC):* Improvements in the management of industrial and municipal wastes were entrusted to NWSC who executed this task in close collaboration with the municipal and local councils, industrial firms, NGOs and local communities.

- Ministry of Agriculture, Animal Industry and Fisheries (MAAIF): This focal ministry on socio-economic and environmental management and investment aspects concerning agriculture was assisted in this regard by several agencies. These carried out the actionable implementation tasks under LVEMP1.

  - *Fisheries Department:* This department was responsible for the fisheries management component. The co-management of fisheries in collaboration with major stakeholders, law enforcement and fishing communities was emphasized. Data collection and financing demand driven community micro projects was supported. These activities greatly enhanced the welfare of the fishing communities. Other activities included the establishment of a fish levy Trust intended to assure sustainability of finance for various community activities under the project.

  - *Water Hyacinth Unit:* This unit was responsible for controlling the spread of water hyacinth on the lake surface and its shores. Through mechanical means, manual clearance and use of biological means, with the speed of the weed expected to be controlled and brought within 10 percent or less of the Lake surface area.

  - *National Agricultural Research Organization (NARO):* Under NARO, two sub-organizations were assisted to carryout specific functions that related to LVEMP1 activities.

  - *Fisheries Research Institute (FIRI):* This institute implemented the fisheries research component. This related to the generation of information on fish biology and ecology, stock sizes, aquatic biodiversity, socio-economic characteristics of fishery stakeholders and restoration of depleted species. The institute is in the process of establishing a strong fishery database primarily on the Lake Victoria and its catchment.

- *Kawanda Research Institute (KARI):* This institute handled varieties of activities mainly related land management, soil and water conservation as well as appropriate use agro chemicals. This is especially important taking account of sensitive drainage areas i.e. valleys and catchment wetlands. This institute worked closely with local authorities, NGOs and communities.

- *Lake Victoria Fisheries Organization (LVFO):* The LVFO is autonomous regional fisheries organization established by Kenya, Tanzania, Uganda in 1998 to provide a permanent Secretariat for fisheries research and management on the behalf of the three countries. The institute liaises its activities with those of similar research organizations on the Lake Basin.

- *Makerere University Kampala, Zoology Department:* This department was especially charged with the responsibility of strengthening human resource capacity in fisheries biology and aquaculture sciences.

Achievements and Lessons Learnt

As highlighted in the paragraph 2.3 above the institutions involved in the implementation of the various components of LVEMP1 included the Ministry of Water, Lands and Environment (MWLE); the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and Government Agencies i.e. NARO, FIRI, LVFO, NWSC, Makerere University, Kampala and Lake Victoria Fisheries Organization (LVFO). These institutions have implemented various aspects of the LVEMP1 in close collaboration with local communities; local government authorities; NGOs and civil society in general. The outcome and achievement in implementing the various components of LVEMP I are summarized in the matrix Annex I.

Proposed Bridging Activities.

The Ultimate goal of LVEMP1 was to achieve sustainable utilization of lake resources and to improve welfare of current and future generations. To some extent this goal has been attained as indicated in 1.4.1, however, a lot more effort is still necessary to replicate the achievements of LVEMP1.The following activities still require attention to consolidate and internalize what has been done

Catchment Afforestation: Forests offer the best protection mechanism in catchment areas including hilltops, drainage valleys and farmland. They provide a high water retention and soil binding mechanism that protect runoff and soil erosion. In implementation of this component, the following were established to be missing links and need to be addressed.

- It has been noted that Catchment Afforestation component emphasized provision of seedlings and other inputs as well as technical support to communities aimed at creating demand for tree growing and management. However, these interventions

are still substantially less than the demand and the coverage is still limited. There is need to substantially expand this program.

- Catchment Afforestation should therefore aim at building linkages with local partners and institutions organizations in areas which can assist the component address issues like health, infrastructure and agriculture that are still outstanding.

- There is need to emphasize capacity building through conducting short term courses for field staff and communities to enhance performance. The creation of awareness through training and sensitization of communities on proper watershed management and agro forestry technologies in the catchment area is crucial.

- There is need to establish management mechanism of forest reserves and farm forestry to enhance sustainability.

Wetland management: Lake Victoria wetlands play an important role in effluent treatment and buffering role to the Lake Victoria waters especially when they are located strategically at points where rivers flow into the lake. The component aimed at investigating the role of wetlands in protecting Lake Victoria from impacts of catchment activities and increasing knowledge on the sustainable utilization of wetland resource products. Greater emphasis should be placed on the sustainable use of wetlands at a level significant enough to increase households' income. The following areas and activities merit continued emphasis and intervention:

- Research on Buffering capacity should continue including additional sites taking into account gathering appropriate rural balance. Areas that weren't covered by LVEMP1 should be given priority.

- Investment surveys to explore the potential of activities aimed at adding value to products and identifying potential for papyrus for pulp and paper making, ecotourism, medicinal values of plants, aquaculture, raising ducks and game ranching would be appropriate.

- Preparation of wetland management plans and their implementation for sustainable utilization of wetlands products should be encouraged.

Land Use Management (LUM) was set out to identify the underlying causes of poor land management, assess their magnitude, develop and promote better technologies to achieve sustainable land and water resource management for better environment and improve livelihoods of the population. The following gaps have been identified in the process of its implementation in LVEMP 1 need additional intervention.

- It was noted in LVEMP I policies on land tenure system for management of communal lands, land belonging to absentee land lords and wetlands have remained outstanding. Therefore, there is need for appropriate policies and bylaws in these areas especially to reduce degradation of such unprotected resources;
- Capacity competencies in land management have to be enhanced. This calls for expanded funding especially in technology dissemination and incentives to adopt improved LUM technologies.
- Need for more training of trainers at the grass root and establishing demonstration sites;
- Establishment of catchment nurseries (especially agro- forestry and fruit trees) in collaboration with Catchment Afforestation will enhance soil conservation.
- There is need to strengthen linkages with service providers, NGOs, CBOs and other stakeholders.

Water Hyacinth control

The Water Hyacinth control components registered major achievements in the reduction of the water hyacinth prevalence. However, continued research is required on water weed control options, local community participation and capacity building of the Water Hyacinth Unit. Besides;

- There is need for regional harmonization and coordination of the water hyacinth control and harmonized implementation of agreed options by the riparian states of Kenya, Uganda, Tanzania, Rwanda and Burundi;
- Need for National policy: Strategies and options and programs to manage water hyacinth and other invasive weeds should be based on a National policy supported by appropriate legislation to develop the requisite basin- wide coordination and collaboration.

Capacity building: LVEMP has created an enabling environment for Research and environmental monitoring through provision of equipment and rehabilitation of offices and laboratories, and also training of staff in the various natural resources sectors. However, some of the key issues that the component was set out to address are still outstanding and these include:

- Hitherto Capacity building in LVEMP I has tended to be more inclined to higher institutional levels (e.g. training for MSc. and Ph D. Degrees) and less on interaction with local communities. But, higher level of performance is likely to be realized if the lower communities were more targeted i.e. courses like B.Sc; Certificates, Diplomas, Refresher courses which are likely to have direct impact on local communities.

- There appears to be higher demand for infrastructure especially at lower community levels requiring substantial intervention both additional funds and appropriate technologies.

Continued effort in training, sensitization and creation of awareness in the communities is required to internalize new resource management skills that have been introduced. Holding workshops for communities CBOs, NGOs and extension workers would refine the roles and responsibilities of all involved players in sustainable, economic and environmental management of LVB resources and improving the livelihood of especially the poor inhabitants of the basin.

Implications on Future of Lake Victoria Basin

The unique terrestrial and aquatic biodiversity, potential in soils, minerals, forests, wildlife and fisheries in the basin boosts the lake's natural resource endowment considered the most attractive transboundary heritage in the region. This constitutes a strong bond within and between the five Partner states of the East African Community. It is expected that, the initiation of the LVEMP since 1992 will have far reaching sustainable benefits to the livelihoods of riparian communities.

These issues underly essential development requirements that spell out a strategy for action. There is for instance urgent need for LVEMP to expand its program on capacity building to encompass knowledge and skills formation at community level to ensure community participation in the socio-economic development process and to accordingly enhance realization of other desirable objectives, including, among others, community ownership of various development projects in the lake catchment. Continued efforts in expanding capacity building interventions would help the communities manage and apply new skills in implementing environmentally friendly investments and this would assist restore and conserve the lake catchment and its ecosystem.

There is need to ensure that investment interventions under LVEMP II are effectively coordinated to minimize duplication, overlap and wastage of resources. Maximum returns on investments are to be realized from well coordinated and harmonized investment interventions so that the LVEMP Secretariat has a critical role to play in this regard.

Further more LVEMP Secretariat is expected to identify the potential sources of funding to continuously support its activities in the lake basin. In this context, it is equally important to evolve a long term pipeline of development projects linked to eco-preservation of the lake basin natural resources and that enhance the basin's economic growth potential.

1.10 The Scope of this Study

The execution of this study on natural resources intervention and investment in the Lake Victoria Basin has involved several phases and actions. Consultations with

LVEMP was largely continuous which proceeded with assembling reading materials from the secretariat and other sources as well as securing published literature on varieties of research paper on the Lake Victoria Basin and its catchment from the internet. This process was complemented by direct visits to the central government Ministries, Developments and Agencies as well as to some international agencies, local authorities, NGOs and CBO to directly obtain their views and inputs in the processing and preparation of this study. Information obtained during this phase assisted in the preparation of the inception report and designing a questionnaire to be directly administered to selected communities in the lake catchment districts.
The second and perhaps the most important phase involved undertaking field survey covering basically all the districts in the Lake Victoria catchment. Gathering informationon different aspects and tasks affecting environment and economic management of Lake Victoria natural resources. Responses to the questionnaires and results of direct discussions at local community levels provided data and other materials to process this report.

The assembled information, professional views and opinions particularly regarding the current environmental state of the Lake and the use of natural resources in the Lake catchment has made it possible to confirm the following important aspects:

- Huge amount of literature on the state of fish stocks and water quality of the lake, water hyacinth, but much less information is available on other aspects especially on social economic dynamics i.e. human settlement, land use and so on. Considering that LVEMP is a multi-disciplinary, multsectoral approach for integrated environmental and economic management there is urgent need to expand the scope of research activities in the LVB to embrace emerging issues i.e. poverty reduction and the possibility of implementing “bona bagagaware” strategy, among others.
- Investment opportunities in ecotourism, agro-processing, mining and artisanal fishing are observed to be extremely promising particularly given the prospects of larger markets in the sub-region. Local investors, who should be the prime focus of private investment drive severely, lack requisite skills of modern business; there is need for capacity building to enable meaningful participation of indigenous investors.
- Conditions justifying the establishment of an investment fund to assist expand especially sectoral investment activities at the community level are still largely weak. On the basis of strength, weakness opportunities and threats (SWOT) analysis of financial institutions at community levels suggest these operate at subsistence levels and are severely constrained to embrace required changes.

Though savings and credit cooperative organizations (SACCOS) have recently sprung up in rural communities, have great benefit of open entry and exist of membership; licensed at the district and operating and managed locally, they however, tend not to keep good records. Their profit and loss accounts are generally not in good order and there is hardly any effective monitoring of their transactions. Equally, support of such organizations is up against subsistence mentality of free goods and services from the government and indeed encouraged by some political interference and misinterpretation of requisite investment conditions. The history of the entandikwa fund which was intended to help poor communities embark on commercial business is still relevant. This, not withstanding, there are some evidence that a development fund

could be successfully launched but with some well defined rules and procedures of operations. These are defined in chapter six.

- Lack of comprehensive information also appear to be very weak regarding the operations of both international and local NGOs and CBOs operating at community levels. Though these organizations have significantly impacted capacity building at local levels with regard to modern business and financial practices, reliable information on their activities is not easily available. This is an important area where research at LVEMP secretariat is extremely essential.

1.11 The Structure of the Report

This report is structured so as to provide a natural sequencing of its objective and substance of Lake Victoria and its catchment natural resources, lessons learnt under LVEMP 1 and scope of this study in chapter one; chapter two presents the rationale, study objectives and methodology used to carry out this study; chapter three provides the findings of field survey including opportunities for natural resources investments and interventions; In chapter four the status of Community Driven Development and applicable rueglatory framework and investment opportnites are indicated. Chapter five outlines potential and investment opporutnites anr presented. Chapter six justifies and presents the proposed Lake Victoria Basin Investment Fund while Chapter seven, proposes the LVEMP II Implementation framework and chapter eight outlines the project budget and chapter nine present conclusions and recommendations.

2.0 STUDY METHODOLOGY

2.1 Rationale and context of the study

2.1.1 Linking environment /natural resources to poverty/development

The majority of Uganda's population, up to 96 % lives in rural areas, and is highly dependent and invariably linked to direct exploitation of natural resources for their livelihood. About 85% of the population depends on agriculture for their livelihood. A third of Uganda's population lives in the Lake Victoria Basin. The fisheries sector contributes 2.2% of GDP. Over 90% of Uganda's population depends on fuel wood for their energy requirements, and 3% of energy requirements is met from biomass. The Contribution of the Forest Sector to GDP has been estimated at 6%.

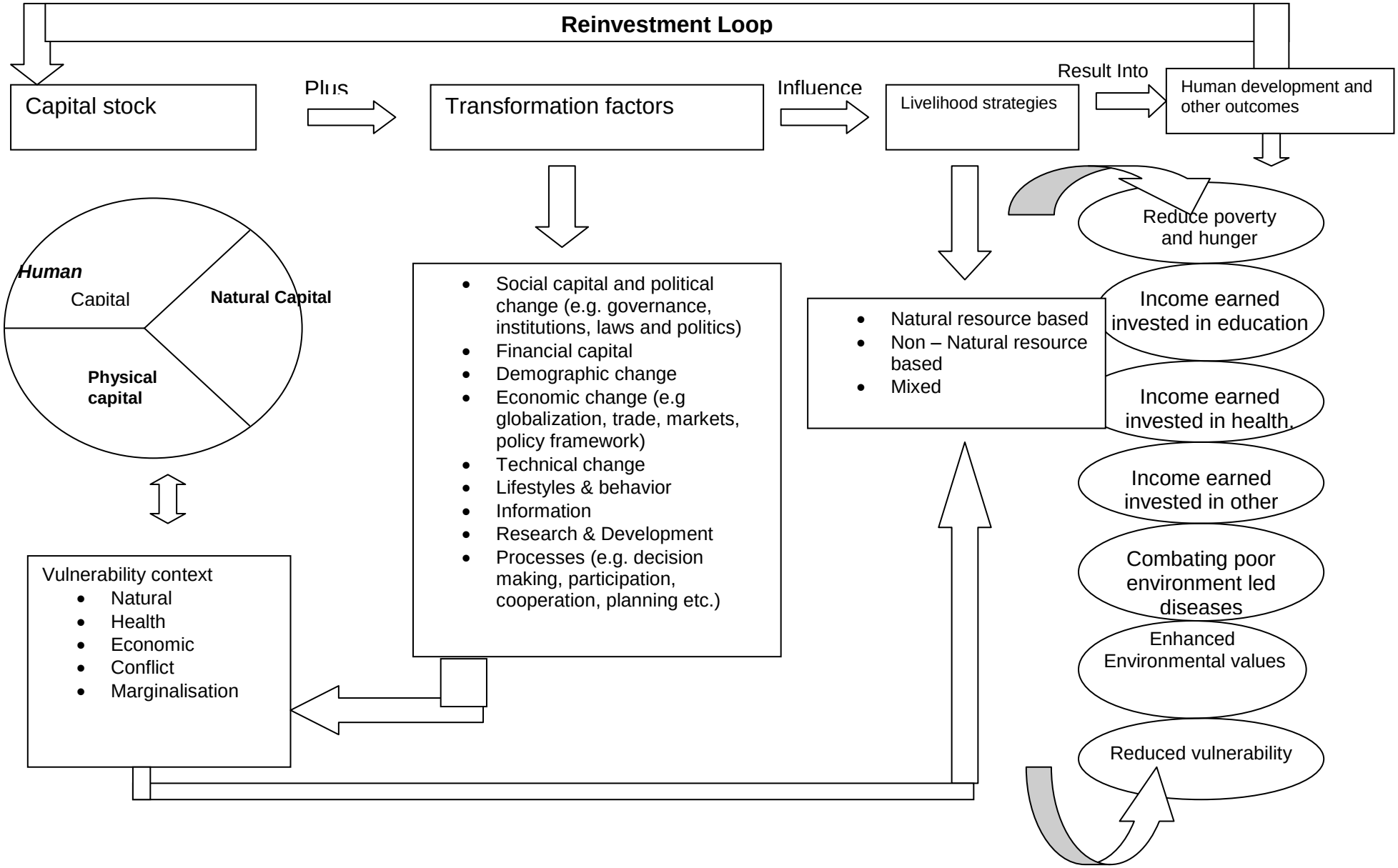
The intensive banana – coffee farming system in the lake Victoria crescent covering the districts of Rakai, Mukono, Mpigi, Wakiso, Luwero, Mubende, Kalangala, Rakai, Masaka, Iganga and Kamuli has witnessed a decline in banana production, with a drop of 19% in production largely due to declining soil fertility . These perennial crops are being replaced by annual crops (maize and bean) exposing the area to erosion, with serious implications on food security and poverty (SOE, 2004/5). The estimated cost of nutrient loss attributed to erosion is estimated at US$ 625 per year (Yaron, Moyini and others, 2003).

Overall, the Contribution to the national economy from the natural resource sector has been estimated at US$1,000 million per year. Direct benefits from forest and woodland resources, non-forest plant resources, wildlife resources and inland water system resources are estimated at US$411.5 million per year, but this is based on available data and this value could be higher. The indirect benefits include ecosystem services such as soil erosion control, carbon sequestration, water purification and retention (Emerton and Muramira, 1999). The water purification value of the Nakivubo Wetland has been estimated at US $ 8 Million per year.

For the purpose of this study, the UNDP framework demonstrating a synergistic and symbiotic relationship between the environment and human development has been adopted. It builds on other frameworks, such as DFID (2002), UNEP (2002) and UNDP/World Bank/EU/DFID (2002).

As a process, sustainable development uses three basic capital inputs: human, physical and natural capital. The natural capital is transformed into human development outcomes, using social and financial capital, technological, socio-political, economic, demographic changes, among others. This can also be influenced by external drivers such as globalization, trade, market, policy framework and processes of regional and international cooperation. Livelihood strategies are influenced by the natural capital at the disposal of individuals or community, the vulnerability factors and the transformation factors. The development results of these livelihood strategies include human well-being and poverty reduction. These outcomes then form the reinvestment loop, ensuring a better position for the future generation.

Framework: Environment and Development



2.1.2 Concept of Sustainable Development

According to the Brundtland Commission, sustainable development as an outcome is development that "meets the needs of the present generation without compromising the needs of the future generations to meet their own needs". And as a process of change in which utilisation of resources, the direction of investment, the orientation of technological development and institutional change are in harmony and enhance both current and future potential human needs and aspirations".

According to Serageldin and Steer (1994), a country's total national capital is made up of human-made or fabricated capital, natural capital, human capital, and social capital. For development to be sustainable, a country's future total national capital must be equal to or greater than the one today. Also when one talks of sustainability, it is important to recognise that several levels exist: weak, sensible, strong, and absurdly strong sustainability (Serageldin and Steer, 1994). The sustainability of Uganda's development is probably weak. Economic growth is to a large extent being achieved by 'mining' the natural resource base at a cost of about 10% of gross national product (GNP), as conservatively estimated by Slade and Weitz (1991). Adopted from SOE, 2002/2003.

2.1.3 National Strategy for Sustainable Development

Since the Earth Summit in Rio 1992, the Government of Uganda has put in place several policies, strategies and plans which in whole or in part address the principles of sustainable development. Some of the national strategies are presented in Box 2.1. In addition to these, Uganda is involved in the implementation of regional strategies such as the East African Development Strategy and the Nile Basin Initiative.

Box: 2.1

Selected Sustainable Development Strategies in Uganda

- Vision 2025;
- Poverty Eradication Action Plan (PEAP);
- The Medium Term Expenditure Framework;
- District and Sub-County Development Plans;
- The Local Government Development Programme (LGDP);
- The Medium Term Competitiveness Strategy (MTCS) for the private sector;
- The Plan for the Modernisation of Agriculture (PMA);
- National Agricultural Advisory Services (NAADS);
- Rural Development Strategy;
- The National Biodiversity Strategy and Action Plan (NBSAP);
- The Wetlands Sector Strategic Plan;
- The Ten-Year Road Sector Development Programme;
- The Education Sector Investment plan;
- The Health Sector Strategic Plan;
- The Water Action Plan;
- The National and District Environment Action Plans;
- The Fisheries Sector Strategic Plan;

2.1.4 The East African Development Strategy

The vision of regional integration in East Africa is to create wealth, raise the living standards of all people of East Africa and enhance international competitiveness of the region. These are to be achieved through increased production, trade and investments into the region. The development strategy gives priority to building the supply capacity in the region. Emphasis is placed on enhancing the capacity of the productive sectors notably agriculture, industry, tourism and natural resources.

Under this strategy, Lake Victoria basin, known for its immense socio-economic potential and ecological values, has been designated as a regional economic growth zone to be exploited jointly to maximise economic and social benefits while ensuring effective environmental management and protection. The development strategy in this area is to:

- Establish an institutional and legal framework that will coordinate the regional aspects of the activities of the different actors and interest groups in the Lake Victoria basin, based on the outcome of the legal and institutional study;
- Prepare and implement a comprehensive Development Strategy and Action Plan for the Sustainable Development of Lake Victoria Basin that shall focus on economic growth, poverty reduction, and protection of the environment. The recommendations of completed and on-going studies shall be incorporated in the comprehensive development strategy;
- Implement the Strategic Partnership Agreement between the Partner States and the Development Partners supporting sustainable development of Lake Victoria Basin.

Joint management of Lake Victoria and its basin as a shared ecosystem after 1992. To date, protocol for sustainable management of the Lake Victoria Basin and a Lake Victoria Commission as a body for regional management of the lake Victoria Basin have been established.

2.2 Purpose and objectives of this study

Implementation of LVEMP 1 has generated significant baseline environmental data, knowledge, technical capacity and ability in the riparian states to embark on a long-term program of resource management and environmental improvement. The identified priority areas of focus for LVEMP11 include socio-economic development, Management and Research. The challenge is to develop interventions and propose investments to promote environmentally and socially sustainable economic development. This study assesses the potential for natural resources interventions/investments in Lake Victoria Basin.

The specific objectives of this study include:

- To identify priority investments both short term and long term, in the lake Victoria Basin;

- To propose establishment of an investment fund to support sustainable investments at the national and transboundary levels with specific emphasis on micro-enterprises;
- To assess environmental impact assessment legislation and capacity in the countries, identify gaps and propose strategies for harmonization;
- To propose strategies to use Community Driven Development (CDD) approaches for natural resources management**.**

The arising questions are then the following:

- What is the current condition and trends of ecosystems/natural resources, ecosystem services and human well-being in the Lake Victoria basin? What transboundary concerns for Lake Victoria?

- What natural resources interventions/investments are being undertaken, and what consequent changes in ecosystems and impact on human well-being?

- What natural resources interventions/investments can be proposed for sustainable development of the Lake Victoria basin and to enhance economic development and human well-being?

- What implementation mechanism for proposed interventions / Investments?

- What of the enabling environment (policy, institutional and legal framework, funding mechanism) for success of these interventions?

2.3 Methodology for the study

To capture data for this study, a comprehensive approach was used, and included:

- A review of literature and documentation on all study components;
- Stakeholder consultations, particularly the lead government agencies at national, district and local levels, and among resource user groups and civil society organization, as well as development partners;
- Field activities, which included observations and generation of case studies, establishing experiences in natural resources investments and interventions.

2.3.1 Review of literature and documentation on the Lake Victoria Basin

In this activity, relevant literature on the Lake Victoria basin bio-physical, socio-economic and cultural environment, and the institutional, legal and policy frameworks for development and the environmental management have been reviewed. Synthesis reports on impacts and lessons learnt for all components of LVEMP I have enabled better understanding of the Lake Basin natural resources, and previous interventions to ensure their sustainability. Other documents reviewed include the East African

Development Strategy, National sustainable development strategies including the PEAP, PMA, DDP; Natural Resource Management policies and Action Plans; state of environmental reports and socio-economic profiles for the Lake Victoria Basin Districts; previous, recently concluded and existing environmental management projects by NGO's and conservation agencies; Research Publications; and other documents from various stakeholders, Government institutions, conservation agencies and NGO's. The list of reviewed literature is provided in annex 1.

2.3.2 Consultations with stakeholders

During this study, the consultants have ensured coverage of as many stakeholders as possible. The methods used have included individual interviews, PRA methods, focus group discussions and meetings. The PRA methods were particularly useful among resource user groups such as fishermen, farmers, tour agencies and co-management units (Beach Management Units). Guiding questions and questionnaires were used as tools to capture relevant information. Questionnaires were designed, one each for interventions/investments in agriculture, fisheries, mining, tourism and micro-finance. Annex 5 provides the list of institutions and persons consulted.

Stakeholder consultations have been carried at National level, among lead agencies including the fields of environment, development and research in agriculture, fisheries, tourism, mining and micro-finance. At District level focus group discussions, interviews and meetings were held with official in the departments of Planning, Production, Natural Resources and Environment, and Community Development for all the districts within the LVB – namely; Busia, Bugiri, Iganga, Mayuge, Jinja, Mukono, Kampala, Wakiso, Mpigi, Masaka, Rakai, Mbarara, Ntungamo, Kabale, Bushenyi, Mubende and Kyenjojo. The role of micro-finance, extensions services and civil society has been emphasised hence their prominence among agencies visited at district level. All the riparian districts have been visited. Natural Resource based enterprises have also been consulted to find out what they think are the gaps that hinder development and what can work.

Development partners have as well been consulted to find out their appreciation of sustainable development in the lake Victoria Basin, institutional framework for its management and funding mechanism for development activities.

2.3.3 Cases studies in natural resources interventions and investments

In a bid to identify opportunities for natural resources investments and interventions, NGO's/CBO's, natural resource based enterprises, resource user groups in agriculture, fisheries, tourism, mining and micro-finance institutions were visited for selected districts. The selected districts included Busia, Bugiri, Jinja, Mukono, Mpigi, Rakai and Ntungamo. The case study results reveal gaps that will require attention for proposed investments to succeed.

3.0 STUDY FINDINGS: STATUS OF NATURAL RESOURCES INTERVENTIONS AND INVESTMENTS

Through review of literature and various documentations on the natural resource endowment of the lake Victoria basin, review of previous and recent natural resource interventions and investments; consultations with stakeholders ranging from national and district level government agencies, resource user groups, development partners, NGO's and civil society; case studies of experiences in natural resources interventions and investments, information and empirical data has been generated that reveals vast opportunities for natural resources interventions and investment that would strongly support sustainable socio-economic development in the Lake Victoria Basin.

3.1 Agriculture and livestock

Agricultural Potential

The Lake Victoria basin in Uganda is blessed with rich soils and rainfall, supporting a wide range of agriculture. The varying soils and rainfall distribution implies diversity in agroecological zones, ranging from the tropical forests and coffee – banana system in central Uganda to the cattle corridor in western and eastern Uganda. There is a distinct spatial specialisation in the production of perennial crops on the one hand and the production of annual crops on the other. The production of perennial crops is associated with areas of high annual rainfall (1,000 -2,100mm) and less pronounced dry season which include central plateau north of Lake Victoria (Masaka, Wakiso, Mpigi, Mukono, Jinja, Kalangala, Mubende, Iganga, Rakai, Mityana) receiving 1,000-1,500m. The farmers here grow mainly bananas and coffee, often inter-cropped with a wide range of annual crops (maize, cassava, sweet potatoes, coco yams, beans). Sugarcane and tea are mainly grown on large commercial estates.

In areas of lower annual rainfall (500-1,000mm) and fairly prolonged dry season in the east including Busia, Bugiri, Iganga, the main farming activities involve the production of annual crops (finger millet, sorghum, maize, cassava, sweet potatoes, groundnuts, and cow peas). In the west (Rakai, Mbarara, Ntungamo, Kiruhura, Isingiro) there is great emphasis on livestock production with farmers keeping large numbers of animals particularly cattle and growing some annual crops.

Agriculture, which consists mainly of crop and livestock production, is the backbone of Uganda's economy. Eighty five percent of the population of about 28.0 million people live in rural areas and depend heavily on agriculture for their livelihoods. The agricultural sector contributed 42% of the total GDP in 2000; and accounted for 85% of export earnings, provided approximately 80% of employment, and was the basis for most industries (UBOS, 2001) while contributing positively to the country's food security.

However, the agriculture within the lake basin districts remains largely subsistence, extensive, un-mechanized with poor agricultural practices dominant, and characterized by low yields. A case to note is land degradation in the intensive banana-coffee farming system in the lake Victoria crescent (Mukono, Mpigi, Wakiso, Luwero, Mubende, Kalangala, Rakai, Masaka, Iganga and Kamuli). Matooke productivity here fell by 14% of total food production between 1970's and 1990's due to declining soil fertility, pest and disease pressure. The perennials are being replaced

by annual crops – maize and beans leaving the soils exposed to erosion (SOE 2004/2005).

Bush burning, excessive cultivation, land fragmentation, encroachment on wetlands and deforestation have been rampant. Potential available land has shrunk to 2.3 ha per household (IFPRI 2004) from 3.7 in 1969 (Housing and Population Census, 1969). The average holding stood at 1.4 to 1.5ha in 1990 per household, but representing 60% utilization as of 2005. Labour and accessibility are limiting factors.

PMA, NAADS and RDS:

Recognizing the importance agriculture plays in the economy of Uganda and in supporting rural livelihoods, Government came up with a plan to modernize the sector. The Plan for Modernization of Agriculture (PMA) was put in place in 2000 (MOFPED/MAAIF, 2000). This provides practical translation of the objectives of the Poverty Eradication Action Plan (PEAP), and Uganda's *Vision 2025*. Based on the poverty focus and the need to transform agriculture, the vision of the PMA is: *poverty eradication through a profitable, competitive, sustainable and dynamic agricultural and agro-industrial sector.* The mission of the PMA is eradicating poverty by transforming subsistence agriculture to commercial agriculture.

To improve agricultural extension services in line with government policies of decentralization, liberalization, privatization and empowerment, the National Agricultural Advisory Services (NAADS) has been rolled out in various districts, including Mukono, Jinja, Iganga, Bugiri, Busia, Wakiso, Masaka, Sembabule, Mubende, Rakai, Mbarara, Bushenyi, Ntungamo and Kabale in the lake Victoria basin. The services are promoting market oriented farming; empowering subsistence farmers to access privately delivered agricultural advisory advice and foundation technologies; creating options for financing and delivery of agricultural advice for the different farmers. In some districts though such as Mpigi, Jinja and Mayuge the traditional public service agricultural extension services remain operational.

NAADS has over the years, since 2001, developed three approaches in developing and promoting agricultural enterprises, including:

a. Farmer-driven Approach/Conventional

- Under this approach, farmers through their farmer groups identify, and prioritize viable enterprises through a facilitated participatory process guided by a situational analysis.

b. National Level Intervention Approach

- NAADS provides strategic support to each district for the development of those enterprises for which clear market opportunities exist. These are opportunities that are beyond the farmers' horizons. Examples of these enterprises are temperate fruits in Kabale, Citrus and Mangoes in Eastern Uganda such as Iganga.

c. Strategic Enterprise Approach

- The need for short-term impact of the NAADS programme and exploitation of public and private sector partnership has emerged. The NAADS has therefore developed the "Strategic Enterprise" concept whereby farmers in each of the NAADS implementing districts select one "strategic" enterprise for which there are clear market opportunities. Examples are poultry for Busia, Grapes in Kabale, improved goat breeds in Mbarara and Rakai, Vanilla in Mukono, and fish farming in Wakiso Districts. Strategic Enterprise promotional activities are carried out in partnership with identified entities, which offer opportunities for infrastructure for post-harvest handling and market linkage.

d. Partnership development

The principle for Partnership is that, NAADS develops Strategic partnerships with key stakeholders already involved in the development and promotion of that particular enterprise to enhance their efforts. Some examples are provided in table 3.1. In this way, enterprises can be developed faster into commercial concerns to ensure that farming becomes a business. The major principles behind the Partnerships include:

- Linkage to markets and infrastructure;
- Establishment of quality standards;
- Capacity building;
- Technology development and sharing;
- Provision of inputs.

Table 3.1: Existing partnerships

Enterprise	Potential Private Sector Partner
Coffee	Kaweri Coffee Farmers
Cotton	The Uganda Ginners Association
Palm oil	BIDCO, in Kalangala District
Temperate fruits	International center for Agro-forestry (ICRAF), in Kabale
Vanilla	Uganda National Vanilla Association (UNVA)
Rice	Tilda Ltd., Bugiri District
Maize & Beans	Uganda Grain Traders (UGT)
Sorghum	Nile Breweries
Vegetable Oil (Sunflower)	Mukwano Group of Companies
Livestock	Uganda Beef Producers Association
Apiculture	Bee Natural Products (BNP)
Agricultural Inputs	Agro-shops, such as FICA Seeds

Source: NAADS, 2006

Environmental Concerns

Some of the impacts of agriculture highlighted during the field visits and in the district state of environment reports include:

- Encroachment on fragile ecosystems, including wetlands, lake shores, river banks forest reserves, steep slopes, and rangelands conversion;

- Soil erosion and nutrient depletion, leading to low productivity, particularly in the districts of Rakai, Ntungamo, Mukono, Masaka, Mbarara;
- Destruction of landcover on hilly areas, such as in Ntungamo district;
- Good soil conservation practices lacking, with traditional practices such as having grass bands between gardens no longer in place;
- Lack of appropriate By-laws and ordinances to enforce and promote good agricultural and land use practices;
- Limited land for extensive agricultural production, with land fragmentation common in the visited districts.

Land use concerns

Under LVEMP1, the land use component was implemented under three sub-components, namely integrated soil and water conservation, management of pollution loading, and assessment of agrochemicals. Soil erosion was a major concern, highest in rangelands and fields cultivated with annual crops. In pilot districts such as Mayuge and Rakai, soil erosion hazard maps were produced to guide land use management interventions. Under on-farm research approach, several farmers were trained. These technologies have since been adopted and sustained by local communities, with the major result being increased land productivity.

The current agricultural research and extension system (NARS, NAADS, and partners – such as SASAKAWA Global 2000), NGO's and farmer institutions provides an opportunity to scale up successful interventions under LVEMP I. The Local Governments need to be supported in making effective bye-laws and their enforcement. Continued applied research is also required to establish appropriate interventions for the various land cover types. It was also noticed other players such as NGO's (CARE, PRIME WEST, ECOVIC) are involved in land use management intervention with which synergies can be established under LVEMP II. Other major players include the Trans-boundary Agro-Ecosystems Management Project (in the districts of Mbarara, Kabale, Rakai, Ntungamo), the NBI - NELSAP Kagera River Basin Integrated Water Resources Management and Malakisi-Malaba-Sio River Basin (Busia District) projects with which synergies need to be developed.

Figure 3.1Wetland encroachment for maize growing in Mpigi district along Katonga river

Box 3.1 General observations from district field visits

- Agriculture is still practiced mainly at subsistence level, though there is a growing tendency to grow more for sale;
- Innovations by Agricultural Research Institutes/Agricultural Research Centres in improved technologies are being promoted by NAADS and services providers, and adopted by local communities. For crops such as maize and groundnuts, the output has increased tremendously;
- Non-traditional high value crops are being adopted including fruit growing, pineapple growing, pepper in the Eastern Districts of Iganga and Bugiri. Cassava is also being promoted for export and food security. Upland rice is being promoted to limit impact on wetlands and increase rice production in Iganga, Bugiri, Wakiso districts;
- Flower growing has as well expanded particularly in Mpigi, Mukono and Wakiso districts, and most recently Ntungamo district implying it could be undertaken in a number of districts;
- There are cases of failed crops such as Vanilla and Moringa due to poor prices and marketing;
- Crop diseases such as the banana wilt are a major concern;
- The Coffee Development Authority and the CDO continue to promote Clonal coffee and cotton respectively;
- For the cattle corridor, beef processing centres are lacking with the practice of transporting live cattle over long distances for slaughter common; Milk collection centres are now available but value adding plants to convert milk into cheese, ghee, yoghurt, and powdered milk lacking; Under NAADS pig rearing is being popularized and pork processing in Iganga district promoted;
- In the context of the Rural Development Strategy (RDS) and to complement and strengthen NAADS activities, the Integrated Support to Farmer Groups (ISFG) provides support to capacity development of farmers groups, aims at enhancing market access, and facilitates technology delivery;
- The process of formation of higher level farmer organizations is going on in many districts, and for some are established, through which farmers receive ISFG grants under PEAP, and credit from microfinance agencies. Private public partnership in capacity building in Farmer Institutional Development under the RDS is on-going such as with the South East Private Sector Promotion Centre;
- Agro-products collection/storage facilities, agro-processing infrastructure remains poor, hence little opportunity to add value to agricultural products and improve on quality for export. The traditional storage methods and practices such as use of granaries are now hardly practiced;
- Private public partnerships remain few and for selected products such as honey, milk, rice, maize, beans, and sorghum. The areas of emphasis have been infrastructure development for processing, linkage to markets, technology development and quality seed production. This is an area demanding investments with growing output expected;
- There are initiatives under FOODNET to improve agricultural produce marketing and information systems;
- Funding for Agricultural extension activities remains very low at both Central and Local Government level, estimated at 3 – 4%;
- NAADS coverage remains low for several districts (e.g. Iganga only ten out of 25 sub-counties; Busia only six sub-counties are covered), and competence areas of service providers under NAADS limited. NAADS is yet to be scaled up to all LVB districts.

3.2 Fisheries

Fisheries Biodiversity: Species Composition

A lakewide bottom trawl survey of 1969 –1971 (Kudhongoni and Cordone, 1974) yielded 24 fish species belonging to 21 genera, with *Haplochromine species* most abundant contributing 83% by weight, *Bagrus docmak* 4.2%, *Clarias gariepinus* 4.1%, *Oreochromis esculentus* 3.8%, *Protopterus aethiopicu*s 2.8%, *Oreochromis niloticus* 0.5% and *S. victoriae* 0.4%, with *Lates niloticus* insignificant.

A survey conducted in 1997 to 2000, 17 species groups, (14 genera) were recorded. The dominant species in areas deeper than 4m by weight were *Lates niloticus* (86.5%) followed by *Oreochromis niloticus* (9.8%), *haplochromines* (3.4%) and other species (0.3%). The highest proportion of the fish was in waters 4-30m deep, the operation area of artisanal fishers.

For the landing sites visited in the Districts of Busia (Majanji), Bugiri (Wakawaka), Jinja (Rippon), and Mukono (Katosi), three species including *Lates niloticus*, *Oreochromis niloticus* and *Rastrineobola argentea* (Mukene) dominate the commercial fishery, to the tune of 70 – 75%, 20 – 25% and 1 – 5% respectively. Other commercial species are *Bagrus docmak*, *Clarias gariepinus*, Protopterus *aethiopicu*s, and *S. Victoria*, but in much lower volumes.

The Fishing Communities and Landing Sites

Populations at the landing sites continue to grow at an estimated rate of 2.5% per annum, with more involved in fishing activities due to the open access policy to lake resources. For the Districts of Bugiri, Mayuge and Mukono, an influx has been witnessed following expulsion of encroachers from the South Busoga Forest Reserve. For Mukono District alone, there are now 246 landing sites with an estimated 10,000 persons directly dependent on fishing activities, another 40,000 indirectly (DSOE Mukono, 2005). The Fishing effort has increased, with more boats and the use of illegal fishing gears such as hooks, and small sized nets, as the fish catch declines. These communities have as well had to find alternative means of livelihoods to supplement fishing, including deforestation for charcoal production, and encroachment on wetlands for farming. Some landing sites have been located in sensitive ecosystems (forests) such as Kome and Bugaya in Mukono and Mpigi Districts respectively hence their degradation. There is also commercial fishing in small lakes and ponds in other districts such as in Mbarara, Ntungamo, and Kabale.

The communities are made up of scattered settlements at shores and on the islands. The stakeholders in the fisheries of Lake Victoria include;

- Youthful fishers proving services to boat and fishing gear owners;
- Resident and non-resident fish traders;
- Fish processors operating traditional and improved smoking kilns;

- Auxiliary service providers, such as boat builders, net repairing and transportation, shop owners.

Beach Management Units (BMUs) have been established in all the Districts bordering the lake, including Busia, Bugiri, Mayuge, Mukono, Mpigi, Wakiso, Masaka, Rakai, Jinja and Kampala. The responsibility includes shoreline conservation, issuing of fishing permits, inventory of fish catch data to enforcement of fisheries regulations. There are differences in capacity of these BMUs with many inactive, but where they have been able to thrive some of the results of their activities include improved information on fish catch, improved monitoring and surveillaince of fishing activities, improved enforcement of fisheries regulations such as elimination of illegal fishing practices and gears, resurgence fisheries diversity and improved infrastructure at landing sites.

With the emergence of the Nile perch export fishery, and stringent conditions in the export market, a number of gazetted fish collection/buying centers have developed with the necessary infrastructure such as washing slabs, landing jetties, water supply and sanitation facilities, and quality assurance services from fisheries inspectors. These include Wakawaka, Busiro, and Golofa in Bugiri district; Katosi, Senye and Kiyindi in Mukono District; Golo, Nabuyege and Katebo in Mpigi district; Kasensero in Masaka and Bukakata in Rakai. Fish Processing plants next to the shorelines have as well developed their own landing sites such as Igoo Foods in Majanji – Busia, and Masese Fish Packers - Jinja. Figures 3.2 to 3.7 provide visual impressions of fishing activities and infrastructure at visited landing sites.

Figure 3.2: Outboard engine boats at Katosi landing site. No landing jetty c onstructed.

Figure 3.3: Boats at Rippon landing site, Jinja

Figure 3.4: Fish transported to urban markets by motor bike, Busia

Figure 3.5: Fish collection facility at Rippon landing site, Jinja

Figure 3.6: Fish weighing slab for local market, and toilets under construction at Katosi, Mukono

Figure 3.7: Fish washing slabs for the export market at Katosi

For the visited landing sites, the following observations were prominent:

- The focus is mainly on three fish species (Nile Perch – Export; Tilapia – Urban consumption; Mukene – local consumption); Fisheries diversity continues to decline with species such as *Barbus sp and Hydrocynus spp* threatened with extinction;
- Fish protein is increasingly less available to the rural communities due to the high cost (Nile perch – Shs. 3000 to 3500 per Kg; Tilapia – 1500 per kg);
- Sustainability of established BMUs in terms of revenues is of concern, where fish factories have established their own landing sites such as in Jinja and Majanji;
- The artisanal fishing communities face being "crowded out of business", since they cannot afford the competing gears for deeper waters, and their partnership with the fish exporters is weak;
- There are concerns from the fishers regarding dwindling fish catch, water levels, wetland degradation, fish habitat loss, resurgence of the water hyacinth, deterioration of weevil multiplication centers, and deforestation by the fishing communities;
- Post harvest losses remain high, in some cases up to 30% for the artisanal fishing communities. Most artisanal fishermen use salting, sundrying or smoking using

raised kilns or pits. Salting and sundrying of nileperch rejects and process off-cuts from fish processing industries is common;

- There is an opportunity for fish value addition, such as Mukene, and infrastructure improvement (cold storage facilities);
- Quality assurance and infrastructure to limit post harvest losses (storage facilities, ice plants) remain inadequate and limited to the export fishery at the landing sites;
- Destructive fishing gears such as undersize gillnets, beach seines, long line hooks, monofilaments, cast nets are still used, and for weak beach management units, enforcement of regulations is ineffective;
- Information collection at landing sites remains poor and distortive, and is focused only on the commercial species;
- Presence of community based organizations and NGO's among fishing communities to leverage awareness levels is low;
- The fisheries sector makes significant contributions to the District Local Governments through tendering fish markets and landing sites, payment of fish trading licenses, fish movement permits, and fishing permits, fish vessel licenses among others;
- Diseases such as malaria, bilhazia and HIV/AIDS are rampant among fishing communities and need to be addressed;
- The hygiene at the landing sites is very appalling, the housing facilities are poor, and there are hardly toilets and other health and social facilities.

Box 3.2: Fisheries Synthesis Report Results:

The EAC Fisheries Synthesis report, 2005, presents transboudary concerns of interest to the fishing industry which are in agreement with the finding above. Key among these are:

- The accelerating eutrophication;
- Overall decrease in lake water levels;
- A sudden and abrupt change in fish community structure since the introduction of the Nile perch, with an increase in Haplochromines, Nile tilapia, Dagaa observed with no change in the Nile perch abundance over the last decade;
- An increased lakewide effort since 1970 in terms of fishermen (35000 to 165000) and boats (9000 to 52000), while total catch remains stable at 400000 to 500000 tons over the past decade;
- The value, export and contribution of the fishery of the GDP have increased, while the contribution of the catches to food supply has declined from 80% to 20% since 1980;
- There are increased investments in the fishery as indicated by the relative increase in number of boats (from 4 fishermen/boats – to 3 fishermen/boat) and the number of processing plants;
- The numbers of researchers and research activities have increased, but not with improved storage of data and historic information at all levels.

Fish Processing and Export Earnings

There is competition for fish supply to the fish factories in Busia (1), Jinja (3), Kampala (7), Masaka (1), Rakai (2) and Wakiso (Entebbe - 2) Districts, most of which operate below capacity – on average 25%. The target fish is the Nile Perch. Nile perch now hardly reaches the local markets, with most of it designated for export. The 16 fish processing plants handle upto 2000 metric tons of fish per week.

However, for most plants over 60% of this weight is lost in the filleting and gutting processes and the wastes are hardly processed into useful by-products. Much as the focus has been export of fresh fish, there is a proposed plant by Alpha Biotech to process this fish waste into fish protein and oil, and animal feed to be located at Mukono and in Kampala with a capacity of 45 tons of waste per day.

For the local market, most of the fish is sold fresh to the urban consumers. Infrastructure for the artisanal fishers remains poor. Salting and sun drying, smoking pits, and poorly constructed smoking kilns are used. The Islands such as Bumeru, Yebbe, Sigulu, Gorofa, Lugala, Wakawaka and Hama Island in Bugiri Ditrict, Kome in Mukono, and Ssese in Kalangala supply most of the smoked fish. Figures 3.8 and 3.9 show some of the fish drying facilities at the landing sites.

Figure 3.8: Fish off cuts from Igloo Foods processing plant delivered for sun drying, Majanji, Busia District

Figure 3.9: Fish drying at Majanji, Busia District

The European Union market accounts for 75% of total exports and other markets include the Middle East, Australia, and the Far East Asia. The table 3.2 presents increase in exports and earnings from the Nile perch fishery over the last decade.

The Uganda Fish Exporters Association (UFPEA) founded in 1993 brings together all industrial fish processors in Uganda. There have been increased capital investments, increased export revenue and improved Private Public Partnership. UFPEA offers its members opportunity for training in HACCP, as well as ISO standards such as 90001:2000 management standard, ISO 14000 environment standard, ISO 2200:2005 which encompasses quality and safety aspects, in line with new EU Food and Feed directive: 882/2004. Support services that have developed include storage facilities and cold rooms at Entebbe Airport, cargo flights, increased presence of international freight companies, improved handling services right from landing sites to the airport, laboratory services and cleaner production services.

The Nile perch fishery has attracted infrastructure investments at various landing sites on the lakeshores. Notable among these are access roads, landing jetties, washing

slabs, sanitary facilities, electricity, ice supply, but their coverage remains limited to a few gazetted export markets on the lake shores. The islands hardly have such infrastructure, yet they are major collection centres for the fish catch.

The export fish processing plants also employ an average of over 300 persons each directly. Igloo Foods Fish Processing Plant at Majanji has a plant capacity of 60 tons per day. It faces competition from other Fish processing plants in Kenya and Jinja. Most of its fish comes from the landing sites in Bugiri district. To ensure its production capacity is utilized up to 30% the plant has contracted 50 suppliers, each employing 15 to 30 fishermen.

Power requirements have made fish processing operations quite expensive. These plants have an average power demand of 1500kv for the process lines and ice plant requirements, and of recent diesel requirement of upto 15,000l per month due to the fluctuating hydro-power supply.

The dropping water levels continue to lead to loss of fish breeding grounds, and also affect landing sites' operations. For the sites of Bukakata, Kasensero and Majanji, the landing jetties have had to be extended further into the lake.

Table 3.2: Fish Exports and Earnings, 1995 – 2005

Year	Quantity in MT	Value in '000 USD
2005	36,000	143,618
2004	30,000	105,000
2003	25,080	86,088
2002	26,800	87,000
2001	28,000	78,839
2000	15,800	34,360
1999	9,628	24,839
1998	14,688	39,879
1997	11,819	27,864
1996	14,075	46,251
1995	16,046	32,262

Source: UFEA, 2006

Aquaculture

Aquaculture is being promoted in the districts of Iganga, Mayuge, Bugiri, Busia, Wakiso, and Mpigi by the respective district Local Governments. The water availability and appropriate retentive soils particularly in seasonal swamps in these districts have made it possible. Under the LGDP grants, the districts of Iganga and

Mukono are investing in demonstration ponds at parish level, but the supply of excavaction equipment, fish fry, feeds, technical expertise, extension services and marketing systems remains linadequate to develop and sustain the aquaculture industry. There are upto 486 fish ponds in Mukono district with 12 Fisheries Extension Officers employed at sub-county level. There are cases of success in earnings from the aquaculture industry from Mukono district.

The species under the aquaculture program include *Oreochromis esculentus, Tilapia zillii, Clarias gariepinus, Lates niloticus, Cyrprinus carpio*. For mirror carp, aquaculture production has been assessed at 10000kg / Ha / annum. The culture of ornamental fish for export is another area of opportunity, with species such as H*aplochromine sp*. and *Alpochelichthys sp.*

Conservation of endangered species such as *Oreochromis esculentus, Oreochromis variabilis, Brycinus jacksonii, Labeo victorianus, Barbus altianalis, Mormyrus victorie* and *Shilbe mystus* needs to be undertaken. These can be cultured in ponds and re-introduced into their natural aquatic habitats.

LVFO initiatives

The LVFO is an institution of the EAC whose aim is to harmonise, develop and adopt conservation and management measures for the sustainable utilisation of living resources of Lake Victoria to optimise socio-economic benefits from the basin for the three Partner States.

The programs of the LVFO are implemented through projects designed to address one or more thematic areas of the programs. The current projects include:

- The Implementation of a Fisheries Management Plan (IFMP) Project for Lake Victoria funded through a grant worth €29 million Euro from The European Union.
- The Socio-economics of the Nile Perch Fishery on Lake Victoria Project Phase II, funded by NORAD through IUCN;
- The Production and Marketing of Value-added Fishery products in Eastern and Southern Africa Phase I, funded by the Common Fund for Commodities (CFC) through FAO and COMESA.
- Support to the Aquaculture Sub sector in the riparian countries around Lake Victoria – TCP/RAF/3102 (A), funded by FAO/TCP.

The IFMP project purpose is to assist the three riparian countries to implement fisheries management measures in line with the Fisheries Management Plan and the LVFO Strategic Vision 1999–2015. Some of these measures include regulation of fishing pressure; Harmonizing and strengthening of the institutional environment for fisheries development, research and management; establishment of an institutional environment that can sustainably manage a modified property and access rights regime using local community structures; Developing proper handling, preservation, processing and storage of fish and fish products. One of the key achievements has been establishment of 1018 BMUs lakewide and their strengthening; improved infrastructure for the export fishery; and capacity building of management and

research institutions to undertake their designated functions and responsibilities such as patrol boats for monitoring.

For aquaculture, studies have been carried out documenting the status of aquaculture in the LVB districts. The IFMP has funded preparation of 6 technical manuals for aquaculture ranging from pond siting, fish seed production, fish culture, and pond constuction and management. There is also funding from FAO/TCP to the tune of US$360,000 offering technical support for aquaculture development in the LVB.

Investment Opportunities in Fisheries

The areas of intervention/investment identified for the fisheries sector include the following;

- Ensuring sustainability of fish supplies through promoting aquaculture and fish caging, and restocking;
- Investments to limit post harvest losses including storage and fish processing facilities for artisans, and establishment of ice plants to support the lake based cold chain;
- Infrastructure development at landing sites both on the mainland and the Islands including landing jetties, fish markets, access roads, water and sanitation facilities, and electrification;
- Quality assurance both for the export and local markets;
- Support the development of fisheries information systems and data bases at every shoreline districts in the LVB;
- Strengthening local institutions, such as Beach management Units for Community driven fisheries resources management;
- Support to artisanal fishers to acquire better tools for fishing;
- Building capacity to facilitate enforcement of fisheries regulations, including patrol boats, communication systems and training.

3.3 Wetlands

According to the *Ramsar Convention*, wetlands are areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salty, including areas of marine water whose depth at low tide does not exceed six metres. However, the National Wetlands Programme (NWP) defines wetlands as *"an area that stays wet long enough for only certain plants and animals to grow even when there is no rain".* Wetlands are one of the most valuable ecosystems Uganda has. Their most valuable attribute is their capacity to store, filter, distribute and gradually release large quantities of Uganda's fresh water stock. Table 3.3 provides wetland coverage in the LVB districts (source: National Biomass Technical Report, 2003).

The uses, values and functions of wetlands

Wetlands have many uses that include hunting, fishing, brick and tile making from clay, harvesting of raw materials such as grass for roofing and handcrafts from rattan cane, and poles for building houses. Other uses include stabilisation of the hydrological cycle, flood regulation, drought alleviation, habitats for biological

diversity and species richness, biomass production of reeds and papyrus and the trapping of sediments and nutrient.

Attempts have been made to value some of the services provided by wetlands. For example, the services that Nakivubo wetland in Kampala provides is estimated at US $ 17 million per year, (Emerton *et al* 1999). As for rural areas, people involved in papyrus harvesting derive about US $ 200 per household per year from wetlands (MWLE 2000).

Table 3.3: Status and significance of selected wetlands in the LVB

District	Wetland Name	Remarks
Masaka	Nabajuzi	Partly converted, water source for Masaka Town.
Bushenyi	Rwanbanjeri-Karugorora	Partly encroached, vital water source
Kampala	Nakivubo	Highly encroached upon by yam growers and settlement. Purification of waste water.
Kampala	Kansanga	Partly encroached upon upstream, purification of waste water
Kampala	Kinawataka	Upstream converted for industrial development, purification of waste water
Kampala	Kitante	Encroached by developers, amenity and storm water retention
Masaka	Nakaiba	Partly converted, purification of wastewater
Jinja	Kirinya	Encroached on the edges, purification of waste water.
Mpigi (Entebbe)	Namiro	Intact, purification of waste water.
Mpigi	Lutembe Bay Wetlands	Proposed additional RAMSAR site
Masaka	L. Nabugabo, Kanywa, Kayugi Wetlands	Ramsar site. Has endemic fish that are threatened and depleted in L. Victoria.
Masaka/ Rakai	Sango Bay	Land use pressure, encroachment

Source SOE, 2002

Threats to wetlands

The following are threats to wetlands encountered during the field visits;

- Drainage for agricultural purposes, for crops such as maize along the Katonga system, sugarcane, yams – along the Nakivubo - Kitante wetland, rice in Iganga, Bugiri and Busia Districts;
- Mining of construction materials, particularly in Mukono, Wakiso and Mpigi Districts, leaving pits that turn out to be breeding grounds for mosquitoes and impacting on local drainage and landscape;
- Dumping of solid wastes, common in several growth centres in the LVB, including Kampala City (SOE, 2004/005);
- Deforestation of swamp forest for wood fuel, craft products, and conversion to agricultural use;
- Pollution from discharge of municipal and industrial wastes, and other urban run-off. Such is the case with the Nakivubo and Kinawataka wetlands in Kampala.

Response to wetland degradation

A major response to wetland degradation has been the preparation of the wetland Sector Strategic Plan (WSSP) 2001 – 2010 by WID supported by the Netherlands Government and IUCN. Implementation of this WSSP is supported by funding from BTC and the Poverty Action Fund (PAF). Relevant policy and legislation for protection of wetlands is in place, including the National Wetlands Policy, the National Environment Act CAP 153, Wetlands, River Banks, and Lake Shore regulations (1998), and the Local Government Act – that put an emphasis on decentralization and community involvement in natural resources management.

The government through WID has gazetted some critical wetlands in the LVB, including Nabajuzi wetlands in Masaka for its important water supply and habitat for wildlife (Sitatunga); the Nakivubo and Kirinya wetlands for their water purification role. Environmental Impact Assessments have to be undertaken for all development activities in wetlands. Uganda has added nine wetlands to the List of Wetlands of International Importance designated under the Ramsar Convention, including Lake Mburo-Nakivali (Mbarara), Lutembe Bay (Wakiso), Mabamba Bay (Wakiso and Mpigi), Nabajjuzi (Masaka, Sembabule, Mpigi), Sango Bay-Musambwa Island-Kagera wetland system (Rakai, Masaka).

The Wetlands Inspection Division was put in place to carry out the monitoring and assessment of wetlands. WID carries various capacity building activities in the districts, and todate has undertaken inventories and mapped all wetlands in the country. These however were based on 1992 images and updating needs to be undertaken.

The WSSP Support Project (Euro 4.1m) has been redesigned focusing on wetland systems, and Rwizi – Rufuha covering only the districts of Mbarara, Ntungamo, Isingiro, Kiruhura and Bushenyi in the LVB. There are other players supporting WSSP including Prime West, Environment Alert and other NGO's, but this is limited. The FAO TAMP project covers some WSSP components for the districts of Kabale, Ntungamo, Rakai, Mbarara, Funding for WSSP is thus limited for various major wetland systems linked to lake Victoria including Katonga, Bukora, Nabugabo, as well as the northern and eastern shores of lake Victoria.

Under LVEMP1 the Wetlands Management Component two sub-components were implemented including wetland buffering studies and the sustainable utilization studies. Several activities were undertaken under these sub-components including rapid assessment of wetlands, buffering capacity studies, cost benefit analysis, capacity building, and Knowledge, practices surveys. Among the sustainable use pilot projects were: propagation trials for rattan cane; wetland products market surveys; demonstration of wise use of wetlands (including fish ponds and crafts making); stakeholder awareness creation and sensitization; and community wetland management planning. Successful cases among these projects need to be considered for scaling up under LVEMP II.

The required interventions include:

- Preparation of Community Wetland Management Plans and their implementation to support communities in deriving livelihoods from this resource;

- Gazetting and demarcation of critical wetlands in the districts of Kampala, Jinja, Masaka and Mbarara;
- Undertaking restoration activities in degraded areas;
- Supporting community ecotourism opportunities in the Ramsar sites and other sites in Bugiri and Mayuge districts;
- Undertaking capacity building of local communities to add value to wetland products, such as clay products and crafts;
- Supporting systematic wetland resources assessment and updates of inventories;
- Supporting dissemination of applied research results, such as the propagation of rattan cane;
- Supporting synergies among the various projects in the wetland sector, including NTEAP, FAO-TAMP, Prime West, WSSP – SP by BTC/PAF, Environment Alert and and other NGO's.

3.4 Forestry

The forestry sector offers various benefits in terms of goods and services, LVB communities and the lake well being is highly dependent on the catchments forest cover. Over 90% of the population in the lake basin is dependent on fuel wood. The forests have also been a source of charcoal, construction materials such as sawn timber and poles, electricity and telephone poles, non wood products such as medicine, honey, fodder and weaving material, and offer various ecological services, including climate regulation, soil erosion control and as a carbon sink. The LVB has three forest types including tropical high forests mainly in central Uganda, savannah woodlands and Bushlands common in the east and mid western Uganda, and plantations of hardwoods and softwoods.

Despite all these benefits, the forest and biomass loss continues, as documented in the National Biomass Technical Report, 2003. Table 3.5 shows negative biomass growth for the study period for all LVB districts except Iganga, making a case for catchment afforestation. The report further shows negative biomass growth in all woodlands, bushlands, grasslands and tropical forests, and positive only in subsistence farmlands and built-up areas. The underlying causes include:

- High population growth rates In the LVB, hence the increased demand for agricultural land, leading to clearance and encroachment on forest land;
- Excision of forest reserves for settlement, agricultural, urban and industrial development. Of recent pressure is mounting to degazette some CFR's such as Mabira and Bugala;
- Weak institutions at local levels for forestry resources management and development, and enforcement of regulations as compared to the centrally management CFR's;
- Poor rangeland management practices, such as overgrazing, bush burning such as in Mbarara, Rakai and Ntungamo;

- Increased demand for fuel wood, charcoal and construction materials from the urban centers such as Kampala, Jinja, Entebbe, Masaka, Mbarara, Mukono, Kabale and Iganga;
- Lack of alternative cheap sources of energy, such as electricity;
- Illegal activities, such as poor harvesting methods;
- The land tenure system in place, that is the root cause of land degradation in the lake catchment.

There have been recent initiatives to revamp the forest sector. The most significant of these have been institutional reforms including the creation of the National Forestry Authority, community involvement in management of Forest Reserves, and the Private sector involvement in the forestry sector. The Central Forest Reserves are being replanted by NFA, some in collaboration with the private sector.

Under LVEMP I the CAPP component established 42 nurseries in 9 districts raising upto 5.7m seedlings for promotion of tree planting; 223.5 ha of degraded forest areas replanted and 20km of boundaries reopened and maintained; undertook capacity building for effective management and wise use of forests, including support to community groups engaged in tree planting; awareness campaigns through demonstration sites, production and dissemination of extension pacakages. The sustainability of this initiatives however is in danger after the CAPP project, with limited actions now by local communities, NGO's and Local Governments. The budget for the Forestry Sector at Local levels remains very low, and the District Forest Services is low. At District level there are efforts to replant Local Forest Reserves and Gazette new ones. For Bugiri district, 2 sites at Nango and Bululu have been gazetted as District Forest Reserves, and replanting of Irimbi Forest Reserve is taking place.

Under the Saw Log Production Grant Scheme (SPGS), several private plantations are being established to cater for future timber requirements. However this is limited to holders of atleast 60 acres and does not cater for rural short term needs such as energy and construction material requirements.

The Farm Income Enhacement and Forest Conservation (FIEFOC) Project funded by the African Development Fund (ADF) has the goal of contributing to towards poverty reduction in Uganda. The objective of the project is to improve rural livelihoods and food security through sustainable natural resource management and agricultural enterprise development. The project has the following components: Forestry support Component (Community Watershed management, Tree planting); and Agricultural Enterprise Development (Small Scale Irrigation and Crop Development, Soil Fertility Management, Agricultural Marketing, Apiculture Promotion). Not all the districts in the LVB will benefit from these projects, and the following table provides a matrix of Forest Support interventions and apiculture activities per district in the LVB with benefiting districts shaded grey.

Table 3.4 presents districts not covered by FIEFOC for catchment afforestation for the districts of Wakiso, Mukono, Mpigi, Kalanga and Mubende in the Central region, as well as Busia, Iganga mayuge and Jinja in the East (not shaded). Other considerations like the Biomass dynamics will as well need to be taken into account though is prioritising these interventions, with the ditricts of Kalangala, Mukono, Mpigi, Mubende and Kyenjojo of particular concern.

Table 3.4: Matrix of project districts and interventions (FIEFOC)

Region	District	Tree planting	Watershed Management	Apiculture
Central	Masaka			
	Wakiso			
	Sembabule			
	Rakai			
	Mpigi			
	Kampala			
	Mubende			
	Kalangala			
	Mukono			
Western	Mbarara			
	Kabale			
	Bushenyi			
	Ntungamo			
	Kyenjojo			
Eastern	Busia			
	Bugiri			
	Iganga			
	Mayuge			
	Jinja			

Source: FID, 2006

The forestry sector offers the following opportunities for investment/ intervention including;

- Plantation Forestry and woodlots for fuel wood, poles and timber production;
- Supporting replanting of degraded local forest reserves and community tree planting with required seedlings, inputs and extension services;
- Promotion of agroforestry which offers benefits in terms of wood and energy production, soil fertility improvement, fruit tree production, fodder production, soil and water conservation, and pest and disease control;
- Value addition to saw logs and other wood products;
- Energy generation from biomass gasification and bio-diesel production;
- Supporting community based ecotourism in natural forests;
- Capacity building in improved tree technologies and extension services;

- Capacity building particularly at district and community levels in collaborative forestry management;
- Supporting synergies among various stakeholders (including local communities, NGO's, CBO's, the Private Sector, Public Sector) and projects involved in catchment afforestation in the LVB;
- Setting up an investment fund to support tree-planting activities in the LVB. The National Tree Fund is not yet operational.

Table 3.5: Biomass growth per district in the LVB

District	Net biomass growth in tons/hectare
Bugiri	-51683
Bushenyi	-24898
Busia	-15204
Iganga	289
Jinja	-785
Kabale	-9056
Kalangala	-406979
Kampala	-3282
Kyenjojo	-765210
Masaka	-112792
Mayuge	-22110
Mbarara	-141681
Mpigi	-374359
Mubende	-406017
Mukono	-836688
Ntungamo	-297

Source: National Biomass Technical Report

3.5 Water Resources

3.5.1 The Victoria Basin Water Resources, potential

Uganda's part of the LVB is endowed with vast water resources including lakes (Lake Victoria and the satellite lakes), rivers, ground water and wetlands feeding into lake Victoria, local and transboundary, including Kagera, Sio, Katonga, Bukora and the northern streams of lake Victoria including Nakivubo and Kinawataka in Kampala. The lake catchment area in Uganda is 28,857km^2, having 31,001 km^2 which is 45% of the lake. The shoreline length is 1795 km, the longest of the three East African Countries. The mean annual rainfall over the Ugandan side of the lake is about 2020 mm and this forms 35.2% of the mean annual lake rainfall.

Lake Victoria is an important purifier and oxygenator for the Nile River, and further downstream, the extensive swampy margins of lake Kyoga further improve water quality and storage role of lake Victoria, with similar roles played by the lakes George, Edward, Albert and associated riverine systems. The lake basin is also known for its fisheries, agricultural, hydropower, and transport potential, as well as its biodiversity richness. The riparian districts of Uganda constitute a population of about

8,102,789 representing an increase of about 2,000,000 people over a decade (UBOS 2005) whose livelihoods directly or indirectly depend on Lake Victoria.

The lake Victoria basin water resources however exhibits seasonal and spatial variation, and influence of climate variability. Rapid population growth, increased agricultural production, urbanization and industrialization are leading to degradation of the available water resources (Water Resources Management Sub-sector Reform Study, 2005). This reform recommendations include: enhanced governance and enabling environment for integrated water resources management; strengthening the institutional structure and operational capacity of WRM at central level; establishment of operational framework for decentralized WRM; and National Strategy for Management of International Waters.

3.5.2 Water Resources Monitoring and Assessment

Water quality

The water resources in the LVB face the threat of degradation in quality, with changing land use practices and encroachment of the riverine ecosystems, degradation of catchment areas due to poor land use practices and deforestation, increased use of agrochemicals, increased effluent discharges and pollutant loads from industries and other point sources into water bodies, inadequate sanitary facilities, and inadequances in water quality monitoring, poor catchment management and weaknesses in enforcement of regulations meant to protect the water sources.

The impacts of deteriorating water quality are already felt in terms of increased costs for raw water treatment, siltation of water sources, algae blooms and the water hyacinth proliferation, polluted and unsuitable water sources for drinking, and occurrences of water borne diseases (SOE, 2002).

LVEMP I addressed the lack of regular water quality monitoring and to a great extent, the deficient capacities for undertaking water quality monitoring and assessment on the lake. Point and non-point sources of pollution were mapped out, and regular lakewide water quality monitoring undertaken.

The Department of Water Resources has a regular quarterly water quality monitoring network covering the whole country, including the lake basin. Other water quality monitoring efforts have been undertaken by FIRI. A National strategy for water quality monitoring has since been developed. The challenge now is resources for implementation of this strategy, and the development of conceptual models (decision support systems) incorporating this data for decision making for sustainable management of the lake basin water resource. There is now a Water Permits Department under DWD with the responsibility of implementing the Water Resources Regulations, including issuing discharge permits and compliance monitoring.

Other areas of concern have been atmospheric pollution, degradation of wetlands exposing the lake to pollution, and limited equipment and capacity to undertake regular water quality monitoring. Continued lakewide and basinwide water quality monitoring will be required, implying transboundary linkages must be emphasized. Institutional linkages should as well be improved, including the Water Resources Management Department, NARS (FIRI, KARI), Department of Fisheries Resources, Research Institutions (MUK Departments of Zoology, Botany, Chemistry,

Geograpghy, Geology, MUIENR, Faculty of Technology), and capacities at various national laboratories upgraded and utilized –Water Quality Laboratory – WRMD, Governmental Analytical Laboratory, and the Department of Geology, Zoology and Chemistry, and at UNBS. There is also need to develop regional local capacity to participate in water quality monitoring, including regional offices and laboratories for the Catchment based Water quality monitoring. Opportunities for information sharing among water resources professionals and water resources information dissemination should be supported.

Industrial and Municipal effluents management

The Industrial and Municipal Waste Management component of the Lake Victoria Environmental Management project carried out an assessment to determine pollutant loads from point sources, which included industrial and municipal effluents and urban run-off from the Uganda catchment of Lake Victoria. Identification of pollution hotspots that pose threats to Lake Victoria was done, and the fishing villages were found to have significant impacts because of their high number, high population density and proximity to the lake. Similarly, factories in Kampala, Jinja and Entebbe with potential threat were identified. The results show that each day 14.17 tons of BOD, 2.91tons of Nitrogen and 2.21 tons of phosphorus were discharged into the lake from urban centres, while 2.96 tons of BOD, 0.37 tons of nitrogen and 0.19 tons of phosphorus are discharged daily from 124 fishing villages with a total population of 92,000. Industrial loads reaching the lake were estimated to be 2.52 ton of BOD, 0.34 tons nitrogen and 0.11 tons phosphorus per day. Studies on the use of natural and constructed wetlands showed that they can play a significant role in further reduction of pollutants from municipal and industrial effluents.

Interventions have been proposed and include improved waste management by the urban centers, improved management and maintainance of existing waste treatment facilities such as for sewerage, protection and restoration of urban wetlands used in waste water purification, and imp[roved sanitary coverage at the landing sites. For industries a pollution control manual for industries was developed that could be a basis for training as well as adoption of cleaner production.

Hydrometry

Quantification of lake water inflows and outflows is essential for understanding the quality and hydro dynamics of a lake system. During LVEMP 1, Hydro-metrological data for the period running 1950-2004 was analysed to provide flows for estimating pollution loads into Lake Victoria from the Ugandan side of the lake. These would also form input to the lake water balance. Continuous rainfall and evaporation records were generated.

The poor state and lack of gauging stations for flow measurements, as well as for rainfall measurements is a hindrance to understanding flow regimes and rainfall contribution from the lake catchment. Gauging stations for the ungauged catchments should be established particularly for the northern shore streams, and an emphasis also placed on transboundary systems such as Kagera and Sio rivers. Activities under NELSAP (for Sio and Kagera river basin IWRM projects) such as preparation of monographs, and the FAO – Nile Basin Water Resources Project to rehabilitate the transboundary hydro-metric network should as well be an opportunity to enhance LVEMP I benefits.

For future sustainable management of the lake water resources, the following measures are proposed:

a) Increased and consistent relevant data collection in Uganda and the riparian countries in general;
b) Increased capacity building, information sharing and coordination between various stakeholders (national and regional) to constantly update and share information on the water budget and water quality for Lake Victoria;
c) Efforts should be made to determine the role played by groundwater in the water budget of Lake Victoria. This was not covered under LVEMP I;
d) Gauging stations for the ungauged catchments should be established;
e) Involvement of local communities in the protection of gauging and meteorological stations, and in data readings;
f) Synergies with other stakeholders in water resources management, such as NELSAP for transboundary systems (Sio and Kagera), and FAO Nile Basin for Decision support Systems should be established;
g) There is need to review water release policy at the main outlet in Jinja and invest in level metres, to cater for the growing demand for higher power generation.

3.5.3 Water for production

Livestock

Table 3.6 provides estimated water requirements for livestock in 1989 and 2010. Water supply infrastructure for livestock remains poor and there is need to rehabilitate and construct dams, dip tanks and other water supply points for livestock.

Table 3.6: Past and future livestock water demand by district in the Lake Victoria Basin

DISTRICT	Livestock equivalent, 1989 (000)	Livestock Equivalent 2010 (000)	Water demand (000 m3/year) 1989	Water demand (000 m3/year) 2010
Bushenyi	257	763	4692	13917
Iganga	236	756	4299	13789
Jinja	77	183	3408	13337
Kabale	162	392	2953	7151
Kalangala	5	25	89	464
Kampala	185	781	3370	14254
Masaka	180	493	3293	8999
Mbarara	338	943	6169	17198
Mpigi	203	590	3706	10768
Mubende	106	295	1962	5386
Mukono	181	458	3309	8351
Rakai	79	230	1442	4195

Source: DWD, 1995

Water for irrigation

Although most of Lake Victoria receives great quantities of rainfall, there are areas within the lake basin faced with water stress, particularly the cattle corridor districts of Mbarara, Rakai, Masaka, Ntungamo, Isingiro, Kiruhura as well as Bugiri and Busia. Under the TAMP for the Kagera Basin districts (Mbabara, Ntungamo, Rakai, Kabale), and NELSAP – IWRM Projects (Kagera and Malaba –Sio – Malakisi river basins) small scale irrigation projects are proposed, as well as preparation of

monographs for appropriate water utilisation. LVEMP II should then promote synergies with these projects for scaling up to other districts not covered.

3.5.4 Water supply and sanitation

With the rapidly growing population in Uganda, the demand for fresh water in the domestic sector is also rising because of increasing per capita water usage. Clean, fresh water is vital to the well-being both of the human population and the wider environment. However, water quality is declining due to domestic and industrial discharge, agricultural run-off, and changing landuse resulting in impacts on human and environmental health. The cost of water treatment for lake Victoria water at Gaba water works has since risen, and the cost of portable water at Uganda Shillings 1050 per m^3.

The National Water and Sewerage Corporation mandated to provide water and sewerage services in large urban centers of Uganda on a commercial basis now covers the towns of Kabale, Mbarara, Masaka, Entebbe, Kampala, Kajjansi, Mayuge, Mukono, Jinja and Iganga in the LVB with upto 175 million litres abstracted per day from the shores of lake Victoria. This will increase to 275 million litres with completion of expansion of water works at Gaba (Kampala) and Entebbe. It has to be noted here the impacts of dropping water levels on raw water quality, costs of water treatment, and water supply. An urgent need has thus arisen to construct new water intakes for Jinja, Kampala and Entebbe to cost US $ 4 million. This does not cover the acute need to extend water pipes in urban areas to ensure increased safe water access/coverage. Besides there are a number of rural growth centers such as landing sites for which safe water coverage remains remote.

Sewerage pipe coverage remains low, with Kampala only covered to 7%. This has led to pollution of alternative water sources to piped water including springs, boreholes due to the high water table. Table 3.7 provides the water supply and sewerage coverage for towns covered by NWSC. The increased coverage to 65% is attributed to extension of mains, increased connection of consumers and creation of public stand points. Improved access and planning for further increases in availability has enormous impact on people's quality of life. The improved access to sanitation also has the potential to improve water quality since local water source pollution such as shallow wells, springs, streams and rivers, as well as eutrophication is largely from domestic and municipal sources.

Table 3.7: Water supply and sewerage coverage in the LVB Towns, 2004

Town	Total of connections	Pipe network (km)	Targeted population	Population served	%served (water)	% served (sewerage)
Kampala	60,077	1043.06	1,252,469	815,405	65	7
Jinja/Njeru	8,018	240.34	142,857	110,000	77	26
Entebbe	4,523	137.88	58,956	37,142	63	4
Masaka	2,701	111.85	62,403	46,179	74	9
Mbarara	4,144	104.83	72,322	57,135	79	6

Kabale	1,621	102.4	47,496	25,173	53	11
Bushenyi	798	44.708	24,045	8,656	36	0

Source: NWSC, 2004

Rural safe water coverage

The access to safe water has increased in the rural areas from 20% served in 1991, 52.8% of the rural population served in 2001 to 55.0% in 2002 (DWD, 2001& 2002). Through the Directorate of Water Development (DWD)'s Rural Water and Sanitation Investment Strategy, there are more boreholes, wells, protected springs and valley tanks installed, increasing access to freshwater by the rural population. DWD target is 20l of safe water per person per day, and the target for the year 2015 is to cover 100% of the rural population. To reach this target, more water points will have to be constructed, and more water supply players attracted, such as from the private sector. DWD also aims at mobilizing the population to promote optimal hygiene and sanitation. For this DWD has had various NGO's in the water and sanitation sector as strategic partners, as well as the Ministry of Health.

Table 3.8 provides the rural water safe water coverage in the LVB. The ranking provided for safe water coverage is for districts national wide.

Under LVEMP I a number of micro-projects in water and sanitation were undfertaken, in rural growth centers and some towns. District development plans have as well identified deficiencies in safe water and sanitation coverage which could be funded under LVEMP II community projects. The districts of Bugiri, Mayuge, Wakiso and Rakai should be of particular concern.

Table 3.8: Summary of rural water supply by districts in the LVB

District	Sanitation coverage by district	Access to improved water		Water point functionality		Investment cost per beneficiary	
		Percent	Rank	percent	Rank	Average (Ushs)Per New Water Point	Rank
Bugiri	Na	28.5	52	91	8	36,437	30
Bushenyi	73.2	75.1	4	79	22	24,818	15
Busia	50.9	60.5	16	89	10	36,502	31
Iganga	48	52.1	34	86	13	55,631	45
Jinja	64	56.2	23	100	1	33,456	27
Kabale	87.4	84.9	1	80	20	73,871	49
Kalangala	48	52.3	32	95	7	41,757	37
Kyenjojo	55.3	42.2	44	61	49	21,715	9
Masaka	63	53.9	19	91	8	20,251	7
Mayuge	46	31.9	50	100	1	44,847	41
Mbarara	71.8	51.1	35	77	31	42,705	39
Mpigi	Na	57.5	21	81	19	27,687	18
Mubende	Na	38.2	47	61	49	24,348	11
Mukono	75.6	61.6	13	100	1	20,338	8
Ntungamo	62	69.1	5	76	33	24,586	13
Rakai	Na	46.7	41	63	46	42,419	38
Wakiso	Na	34.8	49	80	20	20,165	6

Note: na – data not available

Source: DWD, 2004

3.6 The Water Hyacinth

Water Hyacinth was first reported in the Ugandan portion of the lake in 1988, having invaded the lake via river Kagera. By 1997, 80% of the shores of lake Victoria were fringed with 2,200 Ha of stationary water hyacinth. Its proliferation has been associated with devastating socio-economic and environmental impacts, including mechanical damage and obstruction at the power dams and to water transport, exclusion of light and free aeration as well as depletion of dissolved oxygen, release of to gases and fine debris due to mass deaths and decomposition of the biomass.

Prior to LVEMP I intervention, the water Hyacinth control strategy involved multidisplinary and interdisplinary institutional arrangements, involving a Steering Committee of Water Hyacinth, an Agricultural Policy Sub-Committee on Water Hyacinth, and a National Technical Committee. The lack of statutory support for these institutional arrangements and the lack of policy on the management and control of the water hyacinth and other invasive weeds rendered these them temporary.

Only the main implementing institutions in NARO (FIRRI, NAARI) and the Department of Fisheries all under MAAIF continued to operate under LVEMP I. The weed control was achieved through human effort by biological and physical weed extraction, and natural control dynamics such as ecological succession, biomass fragmentation by strong waves, and suppression of proliferation and weed vigour through prolonged confinement in semi-closed bays.

Successes of LVEMP I included

- Establishment of weevil rearing centers and their success of the weevils in controlling the mobile water hyacinth on lake Victoria;
- Community involvement in the mechanical removal at landing sites, with support in form of tools, protective gear, and purchase of fuel;
- Research and regular monitoring of the water weed distribution, proliferation and cover abundance.

Recent resurgence of the water hyacinth is of concern to the fishing industry. Its impacts have included interference with landing site operations and boat mobility on the lake, impact on socio-economically important commercial concerns, including hydro-electricity, generation facilities in Jinja, the Wagon Ferry Terminal at Portbell, and water abstraction and treatment plants in Jinja (Kirinya) and Kampala (Gaba). The prevalence levels were at greater than 40% in may 2006, higher than the 5-10% prevalence rate in 2005. Only 50% of the 20 weevil rearing centers established under LVEMP 1 are operational. This has not been helped by a lack of policy and committed resources for water weed control though these are mentioned in the Plant Protection Act and the National Environment Act CAP 153. The Water Hyacinth Unit

established under LVEMP 1 under the MAAIF faces financial constraints, and is thus incapacitated to undertake monitoring and control activities.

The following interventions are proposed for water weed control:

- The water hyacinth and other invasive weeds requires transboundary actions for its control, particularly on River Kagera, requiring participation of Kenya, Tanzania, Uganda, Rwnada, and Burundi. Recent inclusion of the latter two as EAC member states is an opportunity to adopt a regional strategy and action plan for water weed control;
- A regionally coordinated surveillance and early warning system to provide constant awareness on the status of distribution, proliferation or resurgency of the water hyacinth and other invasive weeds;
- At National level, investment in technology and capacity building for weed monitoring is required, including GIS and low cost remote sensing (RS) data;
- Promotion of synergies with other regional projects such as NELSAP IWRM for Sio and Kagera river basin, and the FAO – TAMP project in the Kagera Basin;
- Further research is required on the effectiveness of weevils for water hyacinth and other invasive weeds control in riverine environments as well as monitoring of infestation status and impacts on water hyacinth resurgence in Uganda. The maintanance of parent stock of weevils at Namulonge and weevil rearing stations lakewide;
- Supporting BMUs and other local community organizations with tools and boats for water weed removal at landing sites and beaches;
- Establish Private Public Partnerships for mechanical weed harvesting at key installations. LVEMP II can consider purcahsing the aquatic weed harvestors while the private companies including UEGCL, NWSC, Rift Valley Railways (formerly URC);
- Capacity building, that would include establishing an autonomous institution to take charge of water hyacinth and other invasive weeds at national level;
- Supporting research on the conversion of the water weeds into useful products, such as biogass, artcrafts.

3.7 Mining

Uganda is known for favourable geological formations for mineral deposits. Modern mining in Uganda began in the mid-1920's and expanded to include beryllium, bismuth, copper, gold, gypsum, iron ore, lead, limestone, lithium, mica, niobium-tantalum, phosphate, salt, tin and tungsten, as well as sand, gravel, aggregate, clays and glass sand.

The mineral occurances in the lake Victoria Basin include:

- Gold in the disricts of Busia (at Amonikakinei and Tira), Kabale, Mbarara, Mubende and Bushenyi;
- Wolfram in the districts of Kabale;
- Tin as caseterite in Kabale, Mbarara and Ntungamo;
- Columbite and tantalite (Niobium-Tantalum) in Kabale, Ntungamo (at Kakanena, Nyanga, Rwakirenzi, Nyabushenyi, Rwenkanga and Dwata) and Bushenyi;
- Beryl in Ntungamo, Mukono and Bushenyi;
- Lithium in Nyabushenyi (Ntungamo) and Mbale Estate (Mubende) associated with pegmatites;
- Clay mainly in Wakiso, Mukono and Mpigi districts;
- Sand, almost in all the lake Basin districts;
- Glass sand notably Dimu in Masaka and Bukakata in Rakai, Kome Islands in Mukono, and in Nalumuli and Nyimu Bays;
- Phospate deposits in the district of Tororo.

These minerals have in the past been exploited, and the peak period was 1950's to early 1970's. However most foreign owned mines closed in the 1970's, and the artisanal miners that took over could not match the demands of capital, technical expertise and operational costs of the modern mining industry. Since then, little has been done to explore and quantify economic potential of these deposits.

All minerals in Uganda are owned by Government and exercise its rights through the department of geological surveys and mineral development, and gives rights to individuals and companies to explore, develop and exploit mineral resources under the Mining Act (2003). At the moment, the licensing regime consists of Prospecting License – valid for one year; Exclusive Prospecting License limited to 20 sq. km, and Special Exclusive Prospecting License with area greater than 20 sq. km – both licenses are valid for one year and are renewable; the Mining Lease which enable mining operations, is granted for a duration ranging from 5 to 21 years; and Location License limited to 40 acres and is granted to small-scale operators for a period of 2 years, renewable.

Under the Sustainable Mineral Resources Development Project, the Department of Geological Surveys and Mines is to invest in geodata acquisition to aid mineral resources exploration countrywide, over a period of 5 years. The main features of the project include:

- Institutional reform and capacity building;
- Geological infrastructure development;
- Improving Environmental Management System in the mining sector;
- Supporting mining communities engaged in SME and artisanal mining.

Current Mining Investments

Despite these recent developments, the artisanal miners are not organized and lack of technological expertise limits their abilities to exploit the mineral resources at their disposal. Examples are artisanal gold miners in Busia, Tin miners in Ntungamo, and clay and sand miners in Mukono, Wakiso and Mpigi district.

Tira Gold Mine run by Busitema Mining Company is probably the only large scale mine to speak of operational in the lake Basin. The Busia area (Busia Goldfield) has occurance of gold mineralisation within the greenstone belt of Archean volcanic and sedimentary rocks of the Nyanzian system that includes Goldfields in Kenya and Tanzania. Recent geochemical surveys (BRGM-DGSM, 1990-1991) indicate four areas of anomalous gold (Tira mine, Bukade-Makina, Osipari, Bude-Kitoja), and geophysical surveys confirmed these anomalies.

For the districts of Mukono, Mpigi and Wakiso, mining of construction materials including sand, clay and aggregates is dominated by artisanal miners who supply the booming constructution industry (see figures 3.10 – 3.13). Most of these minerals occur in public land such as forest reserves, and their activities are regulated by the local governments at subcounty level where licences are obtained and taxes levied for quantities abstracted. In cases where these minerals occur on private lands extra fees are levied by the land owners. However the Mining ACT 2003 now reserves all rights over minerals in Uganda to the Government, and the regulation and granting of permits, licences and leases is centralized, including for construction matetreals.

Some of these mining activities have undertaken Environmental Impact Assessments as required by law, and with inspections and monitoring from the District Environmental Officers, advise on improvements to operations to limit impact on the environment has been provided. Though environmental awareness campaigns have been undertaken, some of these operations have left their toll on the environment particularly on the landscape.

The Kajansi based Uganda Clays plant is one case of industrial exploitation of clay minerals for brick and tile making. Other than Kajansi in Wakiso district, areas such as Namanve in Mukono district have clay deposits that could be sustainably exploited and value added to the clay products. Organised resource user groups among the artisans stand a better chance in accessing credit for improved technologies to exploit this resource and also markets. Under the best case scenario, the annual value of mineral exports is expected rise from the current US$ 10M to over US$ 200.

Figure 3.10: Panning for gold: an artisan demonstrates

Figure 3.11: Brick making from clay at Kyewaga Forest Reserve, Wakiso District

Figure 3.12: Out put of artisan: aggregates at Kyengera, Wakiso district

Figure 3.13: Impact of clay mining activities on wetlands in Namanve, Mukono District

Limitations to Investments in the mining industry

- Though the mineral occurrences are known, there has not been much investment in geodata acquisition to guide explorers and in quantification of the deposits;
- The capital requirements to start mining operations are quite high, and the skill requirement remains very low among artisanal miners;
- The artisanal miners are yet to organize themselves into resource user groups that could benefit from credit and bigger markets;

- The mining sector has in the past not received the priority it deserves, though it has the potential to make significant contributions to the economy;
- The Mining Inspection Division Regional Offices are in dire need of rehabilitation, including laboratory infrastructure;
- There is no resource centre similar to SEAMIC in Dar es Salam for capacity building in the mining sector. The existing institutions such as Department of Geology in Makerere University train undergraduate students in Geology, but no specific disciplines such as geophysics, Mining Engineering, metallurgy and remote sensing.

Opportunities for Investment:

- Geodata acquisition and processing, and supporting utilization of mineral resources geodata;
- Capacity building for artisanal minineers, including training in value addition;
- Infrastucture development (laboratories);
- Marketing Information for mineral products;
- Strengthening the mining inspection division;
- Strengthening Public institutional coordination, such as the Mining Inspection Division and the Environmental Offices in Environmental Monitoring;
- Strengthening Public private partnerships in the mining sector;
- Establishment of a mineral resources centre and revamp of Regional Mineral Inspection Offices in the LVB.

3.8 Ecotourism

Tourism is now a major foreign exchange earner for Uganda. The lake Victoria basin in particular offers opportunities in eco-tourism, including water based activities such as boat rides, forest based activities such as forest excursions, bird watching, and several opportunities in the national parks/conservation areas such as Lake Mburo National Park in Rakai, lake Nabugabo in Masaka, Kome Islands as Chimp sanctuary, Katonga Wildlife Reserve and the Uganda Wildlife Education Centre in Entebbe. Entebbe is a known bird sanctuary and Zika National Forest Reserve near Entebbe a Game Sanctuary.

Within the LVB upto 7 sites have recently been accorded Ramsar site status, including Lake Mburo-Nakivali (Mbarara), Lutembe Bay (Wakiso), Mabamba Bay (Wakiso and Mpigi), Nabajjuzi (Masaka, Sembabule, Mpigi), Sango Bay-Musambwa Island-Kagera wetland system (Rakai, Masaka). These are known for their biodiversity uniqueness and as habitats of unique flora and fauna are an attraction to tourists.

The districts of Jinja, Kampala and Wakiso have thriving ecotourism, though other riparian districts such as Mpigi, Busia, Bugiri, Mayuge, Masaka and Rakai, as well as the Islands of Kome (Mukono) and Ssese (Kalangala), have unique opportunities that

are not exploited due to poor infrastructure. These districts boast of beautiful scenery, fauna and flora, and sites which are potential high quality Ecotourism areas (see figure 3.14 below).

Figure 3.14: Beach side, Sangalo Beach, Majanji, Busia

Despite this scenario, the tourism products are still un-developed. The quality of services and products are still inadequate to meet tourist demands, and the tourism operators and local groups need capacity building. There are various opportunities for the private sector including hotel development, tour and travel operations, professional tour guiding, tourism promotion and capacity building. Key among the capacity building institutions is the Crested Crane Hotel and Tourism Training Institute based in Jinja offering a wide range of course and in-service training.

Stakeholders visited in the tourism sector supported the development of a sustainable Ecotourism Resource Center to provide capacity building services and collaborative marketing of tourism, environmental awareness and education. Some of the ecotourism sites and infrastructure have developed within the 200m protected zone of the lake, and have led to degradation of the environment including wetland encroachment, erosion of Lake Coastline, and water pollution.

Uganda wildlife Authority is the lead agency in wildlife management, established by the Uganda Wildlife Act, CAP. 200. The Wildlife Policy provides for resource sharing with local Goverments and communities, and some collaborative management agreements are being implemented with NGO's, the private sector and local governments.

Uganda has a system of wildlife protected areas, with 10 national parks and 12 wildlife reserves. Between 2000 and 2003, there was a 43% increase in number of tourists visiting the protected areas, gorilla tracking being the most exciting and early morning game drives in the savannah parks for tourists keen to see Uganda's wildlife diversity. UWA also operates boat launches such as on lake Mburo and UWEC on lake Victoria.

There have however been cases of conflict between local communities and wildlife including problem animals such as crocodiles in Bugiri district. There area cases of encroachment on protected areas in search for cultivable land and poaching by neighbouring communities. The facilities of translocation of problem animals remain deficient, such as holding grounds, equipment, transport and financial resources.

The Uganda Wildlife Act Cap 200 in Section 29 provides various opportunities for exploitation of wildlife, other than ecotourism. The types of wildlife use rights include hunting (Class A), farming (Class B), ranching (class C), trading in wildlife and wildlife products (class D), using wildlife for educational and or scientific purposes including medical experiments and developments (Class E), and general extraction (Class F).

Partnerships development in ecotourism

There are public private partnerships aiding tourism development and these are the Uganda Tourism Association, which is an umbrella for all tourism establishments in Uganda, Uganda Hotels Owners Association (private), Hotel and Catering Association of Uganda, various Tour and Travel Agencies.

Community Based Tourism Initiative (COBATI), an NGO, was established in 1998 with a vision to link tourism to conservation, cultural heritage and sustainable rural development. COBATI has promoted tourism in the community through conducting awareness and training in Eastern, Western and Southwestern Uganda. The established Beach Management Units and various resource user groups (wetlands, forests) in all riparian districts offer great opportunity for community involvement in eco-tourism.

The Uganda wildlife Authority offers a variety of opportunities to the private sector for investment including;

- Development and operation of recreation facilities within protected areas;
- Operation of boating activities, such as on lake Mburo;
- Management of UWA facilities such as houses and cottages within protected areas;
- Operation of souvenir shops in all protected areas;

Opportunities for Investment in Ecotourism

- Investments in infrastructure including access trails, information centers, hotels, electricity, roads, and water supply in areas with high ecotourism potential;
- Re-afforestation of degraded areas along the coastline with suitable tree species such as palm trees, that could be utilised for ecotourism

- More and regular water transport between the ports of Kisumu, Jinja, Entebbe, Port Bell, Mwanza and Musoma, etc;
- Upgrading fish landing sites and transforming some of them into small, clean, and well organized and managed ports, with the necessary social services of clinics, transport and communication, banks, safe water and sanitation, electricity, hotels etc;
- Upscaling successful cases under LVEMP 1, community resource centers and craft markets;
- Marketing of ecotourism activities through brochures, internet and the mass media.

3.9 Transport and Communication

3.9.1 Transport Infrastructures

The infrastructure sector especially the physical infrastructure covering roads, bridges, railways, among others, have experienced many years, of lack of repair, renewal and perhaps infusion of new capital investments somewhat still reflecting persistent effects of 1970s and early 1980s civil strife that Uganda went through. The recovery of the economy especially in the 1990s to-date though remarkable, still, requires investments in the infrastructures sector. In the Lake Victoria Basin, it is felt that the absence of functional good road network both national and rural network accounts for the low development activities and persistence of subsistence economy in the basin. This will then be substantially transformed with vigorous infrastructure investments in the Lake Victoria Basin.

The islands on lake Victoria, such as Ssese and Kome, are particularly devoid of infrastructure. These islands have the potential for tourism but lack the roads, electricity, and water transport facilities. THE East African Trade and Transport Facilitation Project is aimed at enhancing transport services along key international transport corridors and strengthening trade growth in the region by securing an effective EA Customs union resulting in reduced transit time, non tariff barriers and uncertainty along the regions transport corridors. This project covers all transportation sectors including water, roads, railways, civil aviation, as well as customs.

3.9.2 Roads

Road transportation is essential for conveying agricultural products and other commodities to the markets. In this regard the road networks play a critical role in accessing varieties of the rural produce to both the primary and the secondary markets in the urban areas. Current estimates are that road infrastructure share of traffic both passenger and cargo at the national level is about 90 percent.

The Government of Uganda has large plans for investing in Transport infrastructure. A Transport Master Plan 2005 has been completed and covers National, District, Urban and Community Access Roads and Preparation of the Ten-Year Districts Roads Investment Program drafts have been finalized. The structure of the current road network in the country is reflected in table 3.9 below:

Table 3.9: Existing Road Network in Uganda

Category	Kms
National	10,800
Districts	27,500
Urban	3,300
Community Access Roads	30,000

Source: National Transport Master Plan, 2005

In 1996/97, Government developed a Ten Year Road Sector Development Program (RSDP) to cost US$ 1.5bn covering national roads. It was updated in 2002 and now includes District and Urban Community Access Roads (DUCAR) at a cost of US$ 2.3bn rolling at intervals of five years to be implemented over the 15-year planning horizon. A Ten Year District Road Investment Plan (TYDRIP) was prepared in 2002, in which the works to be carried out on the District and Urban roads, in terms of initial investment, routine maintenance and periodic maintenance, have been analysed and costed up to the year 2012. TYDRIP is now part of the Road Sector Development programme (RSDP). Construction of bridges under Community Access Roads currently accounts for most of the funding required for this class of roads.

Field investigations have pointed out that on the overall, the road network in the LVB is not yet developed adequately on the Uganda side. Fishing and agricultural activities in the basin are still largely subsistence and in the circumstances not yet attractive to large scale investments. This situation is, however, changing in view of several fish processing plants that are now locating in the Lake Basin, flower growing for exports, increase in commercial agriculture, and investments in eco-tourism. These developments are anticipated to greatly justify public investments in the modern road network in the LVB.

The handicaps for community roads development include lack of funding for construction and maintenance, and the poor technical capacity at districts. The community roads, which were meant to be a responsibility of Local Governments (financed by money retained at sub-counties), virtually have no funding except for a few cases where Community Roads pilot projects have been implemented such as the by AAMP (in Mbarara, Kabale, Ntungamo, Bushenyi, Kyenjojo and Ssembabule). The PAF funds provided to districts as Conditional Grants, have greatly contributed to the improved status of district roads with upto 60% in a “Good to Fair” condition (MoTC, 2006).

With the revitalization of the EAC, and tripartite LVB natural resources for natural benefits, this has greatly highlighted the critical importance of undertaking comprehensive investment in the road sub-sector. It is anticipated that investments in this sub-sector will be regionally harmonized to ensure balanced implementation of related policy and legal instruments guiding these activities and thus create conducive condition to attract further investments. One such regional project is the East African Trade and Transport Facilitation Project (EATTFP).

The potential areas for both public and private investment include:

- Construction and maintenance of district feeder roads and community roads;
- Promoting the use of labor – based methods in districts / local government road works;
- Training local contractors in road works utilizing labor-based methods;
- Capacity building and training in road technology
- Transport planning and safety regulation enforcement.

3.9.3 Water Ways

Water transport has an important role as it provides low cost access to communities living on Islands and remote shoreline locations and complements other modes of transport. The water transportation services on the Lake are equally underdeveloped and perhaps generate less revenue and employment than otherwise if existing opportunities were actively exploited. The bulk of water transport services on the lake are by traditional canoes and engine powered canoes. These are prone to frequent fatal accidents and many lives have been lost.

MoWTC provides and maintains water landing infrastructure and transport services on Lake Victoria. Recent investments on lake Victoria include the purchase of MV Kalangala passenger/cargo ship; construction of Luuku and Bukakata (Masaka) landing sites, and rehabilitation of Lutoboka (Bugalla Island, Kalangala) and Nakiwongo (Entebbe) landing sites. The Rift Valley Railways (RVR) operates two international wagon ferry services from Port Bell/ Jinja to Mwanza in Tanzania and to Kisumu in Kenya. There are also a number of short-distance water way transport services operated by the private sector in form of canoes and small motorboats.

There is therefore need to institute stringent safety regulations, stipulating certain limits to be observed like number of passengers, weight of luggage and provision of safety equipment. Some of these requirements might be too expensive for the traditional canoe transporter. Nevertheless, there is some rather urgent need to establish navigable routes, control the open use of the lake through licencing, rehabilitate the old landing infrastructure and provide modern storage facilities at affordable charges to attract greater numbers of low income users. Other linkages need to be established and infrastructure developed, including the Kome Islands in Mukono districts, and boat services linking Majaanji, Mayuge, Bugiri, Jinja, Kampala, and Entebbe. This will as well boost eco-tourism in the region.

It is to be noted that the modern shipping line like the recently commissioned MV Kalangala Ship can hardly meet the existing water transport demand. This suggests the traditional canoe operators will continue in business for some years to come. But, their boats can be relatively modernized, powered and subject to safety regulations at costs that are affordable in the medium term and hence ensure their safety to passengers and goods. The lake Victoria Safety and Navigation Project being implemented under the Lake Victoria Basin Commission is meant to address navigation aids, search and rescue, hydrography, meteorology, and harmonization of legal aspects.

The potential areas for both public and private investment include:

- Improvement of landing infrastructure
- Installation of navigation and communication aids
- Investment in signaling and communication equipment
- Improved connectivity between major LVB towns
- Harmonisation and improved enforcement of water transport regulations;
- Supporting Public private partnerships for water transport, similar to the case Of MV Kalangala.

3.9.4 Railway Transport

The Uganda railway system presently carries about one million tonnes of cargo annually on the mainline route between Kampala–Portbell and the Kenyan border at Malaba /Kisumu /and Mwanza (Tanzania) along the shores of Lake Victoria.

The railways transport in Uganda has severely declined partly because of loosing substantial traffic to road transportation but also due to lack of innovative management techniques, among other difficulties. There has been also accumulated deterioration in the state of railway infrastructure and almost absence of repair renewal, rehabilitation and infusion of new capital. The Kenya-Uganda Railways (the entire KRC network and URC network – Malaba - Kampala and spur lines to Portbell and Tororo-Soroti lines inclusive of Wagon ferry services) have been concessionaired to one core investor – Rift Valley Railways. To further revamp this sector to active operations as before, the following measures are required:

- Rehabilitation, upgrading and maintenance of the railway tracks;
- Modernization and maintenance of the railway telecommunications systems;
- Modernization and maintenance of the signaling equipment;
- Investment in storage facilities, and cold chain transportation; Integrating the railway infrastructure to capture more domestic and transit traffic by strengthening interchange and interface facilities, and
- Development of local capacity participation in designing investment financing and provision of railway services and ancillary facilities;

- Upgrade Advanced Cargo Information System (ACIS) for tracking cargo
- Upgrade the signal and telecommunication systems and HF radios
- Overhaul the current locomotives and wagons at a cost
- Procure equipments (Cranes, fire fighting equipment, track tamping machine)

3.9.5 Air Transport

Uganda being a landlocked country, air transport plays a vital and strategic role in facilitation of trade, investment and regional cooperation. The sub-sector is currently growing at an annual rate of 13.1% and is solely responsible for export of perishable agricultural produce particularly fish and flowers, which are currently contributing US $184m to GDP. Tourism and Travel, which contribute about US$ 210.7m to the economy, is the single largest foreign exchange earner and over 80% of tourists to Uganda come by air. Cargo volumes rose from 35,000 tonnes in 2003/04 to 50,000 tonnes in 2004/05 and are projected to double every two years (MoTC, 2006). The volume and civil aviation activities are mainly dominated by Air transport operations at Entebbe Airport.

The CAA Master Plan, 2006 provides for development of benefit to the LVB population, including

(i) New cargo centre;

(ii) Development of a Free Trade Zone/Commercial Centre (through privatisation/concessioning arrangements)

In terms of storage infrastructure and the cold chain, the private sector engaged in fisheries, flowers and other perishable products have been responsible for their produce. At Entebbe Airport, a cold facility constructed by CAA is in place managed by the private sector. Investments in such facilities at district level and in value addition will greatly enhance market access by local communities in the LVB engaged in high value agricultural products and fish farming. Other proposed investments include:

- Rehabilitation – upgrading the existing aviation equipment;
- Upgrading air freight and ground handling services and facilities;
- Upgrading of navigational aids infrastructure;
- Enhancement of the capacity for airport operations;
- Encouraging regional cooperation and investments in air transport facilities;
- Development of support services of the air transport;
- Go downs and door to door handling services;
- Development of air traffic markets for passengers and cargo.

3.9.6 Communication

Access of affordable information and communication connections are equally vital to the poor and subsistence fishing community, farmers and other economic categories

in the Lake Victoria Basin. It is important for these groups to be made aware of available opportunities they can take advantage of like higher prices for their goods, availability of inputs at lower prices but also information about possible risks their business and indeed their lives face like the impact of the declining water level of Lake Victoria.

The telecommunication facilitations in Uganda are at present expanding under the impact of on-going economic reforms and service deepening. Thus, with three cellular services including UTL (mango), CELTEL and MTN increased numbers especially in the rural areas are now connected. The number of local radios and news papers has multiplied and this has greatly extended areas of communication coverage and information flow in the basin as elsewhere.

These changes notwithstanding, the growth of telecommunication service in the country is still considered very slow and the unit prices of communication services is still exceedingly high not affordable by the majority of local people. This limits opportunities associated with information flow. In 2003 it was estimated that while Kenya had 7.1 lines per 1,000 people, the equivalent for Uganda was 2.8 lines per 1,000 people. It is anticipated that the creation recently of a separate Ministry of Information and Technology provides clear indication of determined effort to expand public and private investment commitments in this sector.

3.10 Energy sector

The production, delivery and supply of electric power in Uganda is the responsibility of several national power authorities: the Uganda Electricity Generation Company Ltd (UEGCL), the Uganda Electricity Transmission Company Ltd (UETCL) and the Uganda Electricity Distribution Company Ltd (UEDCL). A regulatory agency, Electricity Regulatory Authority (ERA), was established in 2000, to oversee and guide the activities and operations of a liberalized power sector. The main functions of ERA are to provide licensing of the activities in the electricity industry, setting tariff structure, developing and enforcing the industry's performance standards, and consumer protection.

The main part of the energy demand is being met by wood fuel, while only 1% of the total energy demand is actually met by electricity. Electrical energy is supplied mainly by two hydroelectric plants, namely the Nalubaale generating station and the Kiira generating station. The total installed capacity amounts to 327 MW.

Uganda has considerable undeveloped hydroelectric resources on the Nile which are under study for the possibility of early development. There are also a number of sites as well on rivers within the LVB and neighboring districts. Within the LVB, potential sites include Rwizi in Mbarara (0.5 MW), Nshungenzi in Mbarara (20 MW), Kikagati in Mbarara (20MW). Others in neighbouring districts that could be exploited to the benefit of LVB include Maziba in Kabale (now not operational but formally 1.0MW), Muzizi in Kibale (20MW), Haisesero in Kabale (1.0 MW), Sezibwa in Mukono (0.5MW), Ishasha in Rukungiri (5.0 MW), Kyambura in Bushenyi (10 MW).

The Victoria Nile represents major hydropower potential in Uganda. The hydro projects considered particularly attractive for the development of bulk electricity supply are all located on the Nile and are addressed in the East African Power Master Plan. They include, proceeding downstream, Bujagali (250 MW), Kalagala (450 MW), Karuma (200W), Ayago - North & South (500MW), Murchison (600MW). There is also the installed capacity of 180MW at Nalubale and 120 MW at Kiira power stations, though less is available due to the reduced water levels on lake Victoria.

The Uganda and Kenya systems are interconnected, UETCL supplies until recently supplied 30 MW of non firm power to KPLC from the Nalubaale and Kiira hydro plants. In addition, Uganda supplies electricity to the Kagera Region in the northwest area of Tanzania and has cross border supplies to Kenya and in the south to Rwanda. Under the East African Power Master Plan, Tanzania, Kenya and Uganda plan to supply electricity to communities and towns in proximity to their borders. These cross border supply connections are not interconnected to the other countries' grids. Recent system planning studies of the Kenya and Tanzania systems show that there could be potential benefits from an interconnection between these two systems. These potential benefits could be increased by greater capacity in the interconnection between Kenya and Uganda as well.

UEGCL was granted ownership and responsibility to operate the Kiira (Owen Falls Extension) and Nalubaale (Owen Falls) hydroelectric power stations. UEGCL sells as do Independent Power Producers (IPP) the electricity generated to UETCL through long term Power Purchase Agreements. UETCL is publicly owned and owns and operates the electricity transmission network of voltage levels above 33 kV. In addition, UETCL owns all low voltage (33 kV and 11 kV) circuit breakers of all transformers connected to its system. UETCL is also responsible for buying bulk power from the generators and selling it to distribution companies, and for the export to neighboring countries. UEDCL owns and operates the electricity distribution network at voltage levels of 33 kV and below. It is also responsible for the sale of electricity to consumers and electricity trade with Rwanda at voltage levels of 33 kV or below.

The government has designed a rural electrification program with the aim of promoting economic development in the rural areas by providing them with access to electricity to support social and economic activities. The program is made up of a rural electrification strategy which is designed to put in place all the institutions needed to realize the set objectives. The use of rudimentary energy source has in the past led to serious environmental degradation. The government has already established the Rural Electrification Agency, which will initiate rural electrification projects and then pass them to the Electricity Regulatory Agency for licensing. A rural electrification fund has been established to provide part of the funding required for implementing small-scale projects.

To date only 2% of Uganda's rural population and 8% in urban areas use electricity with 9% of the country electrified. The mini-hydropower potential sites enumerated above if exploited present an opportunity for extension of power to the LVB production zones. This power will be critical to socio-economic development, including development of ice production and cold storage facilities, reduction of post

harvest losses, electrification of agro processing centers, and improved quality of life in the urban centers and at gazetted landing sites.

Other alternative sources of energy include solar panels for light activities such as heating and drying purposes; and biomass gassiification utilizing agricultural and Municipal waste such as the proposed Lugazi, Kakira, Kinyara plants that will utilize cane waste (bargasse), the BIDCO plant in Bugala Island, Kalangala district that will utilize palm oil wastes, and the Kampala City Council proposed plant at Kitezi utilizing Municipal waste. Little has been done so far to explore opportunities offered by wind energy.

Under the World Bank funded Energy for Rural Transformation [ERT] Program the aim is to increase access of rural electrification from the 2% to at least 10% by the year 2012 using the private sector and commercial led modality- as one of the ways to improve incomes among the private sector, the poor rural households through the stimulation of economic activity and contributions to the industrialization and to safeguard our environment**.**

3.11 Environmental Management and EIA Legislation

3.11.1 Policy and Legal Framework

There have been significant efforts in improving the policy and legal framework for sound environmental management since 1992. The new Uganda constitution came into force in 1995 with guiding principles on environmental management, and has since been amended in 2005.

As part of the National Environment Action Plan (NEAP) process, the National Environment Management Policy was put in place in 1994, followed by the National Environment Act of 1995 that established the National Environment Management Authority (NEMA). Additionally, sectoral policies, strategies and Action Plans, Laws, Regulation and bye-laws have as well been introduced including: *the Water Policy (1994); the Water Act (1995); the Wildlife Policy and Act (1995); the National Wetlands Management and Conservation Policy (1996); the Fisheries Policy (2000); The Fisheries Act (2003); the National Forestry Policy (2001), the National Forestry and Tree Planting Act (2003); the National Agricultural Research Policy (2003); The Land Act (2000); the Local Government Act (1998); The Animal Breeding Act, 2001; The Agricultural Seeds and Plant Act; the Mineral Policy, and the Mining Act, 2003; The Electricity Act; the Investment Code, The National Biotechnology and Biosafety Policy (2004).* The details are provided in Annex 6.

These policies and laws address issues such as sustainable development of natural resources, biodiversity conservation, establishing a competitive environment for investment and community participation in natural resources management and benefit sharing, and the roles of civil society and the private sector.

The overall National Environment policy goal is "sustainable social and economic development which maintains or enhances environmental quality and resource productivity on a long term basis, that meets the need of the present generation without compromising the ability of future generations to meet their own needs". This policy sets out the objectives and key principles of environmental management and provides a broad framework for harmonisation of sectoral and cross-sectoral policy objectives.

For all national, sectoral policies and laws, strategies, Action Plans and regulations have been developed to enable their implementation. The National Environment Management Authority has further enacted subsidiary regulations that are of relevance to sustainable development and biodiversity conservation such as:

i) The National Environment (Wetlands, Riverbanks and Lakeshores Management) Regulations, 2000;
ii) National Environment (Hilly and Mountainous Area Management) Regulations, 2000;
iii) The Environmental Impact Assessment Regulations (1998);
iv) The National Environment (Access to Genetic Resources and Benefit Sharing) Regulations, 2004;
v) The National Environment (Minimum standards for management of Soil Quality) Regulations, 2000;
vi) The National Environment (Standards for discharge of Effluent into Water or on Land) Regulations, 1999;
vii) The National Environment (Waste Management) Regulations, 1999;
viii) The National Environment (Management of Ozone Depleting Substances and Products) Regulations, 2001.

The Environmental Policy objective with respect to economic instruments is to ensure that individuals, groups, businesses and other economic entities have appropriate incentives and disincentives with regard to sustainable resource use and environmental protection (NES, 1995). The Investment Code (1991) reflects a major reform of Government Policy and is designed to promote, facilitate and monitor investment by rationalizing the way investments are approved and introducing incentives.

A range of economic measures and instruments are being used to help address environmental concerns, including: property rights – so that local communities are fully involved in the management of natural resources; market creation – to target the residents and increase their economic gains and control over natural resources; financial instruments so that local communities can invest in alternatives to natural resources-depleting activities.

Box 3.2: The Constitution of Uganda, 1995

The Constitution for the Republic of Uganda, 1995, sets out state Policy objectives that must guide Government in the formulation of national policies. Under the National Objectives and Directives Principles of State Policy, the following are some of the relevant articles to sustainable management of Biodiversity.

XIII: Protection of Natural Resources
The State shall protect important natural resources, including land, water, wetlands, minerals, oil, fauna and flora on behalf of the people of Uganda.

XXI: Clean and Safe Water (Objective XXI)
The State shall take all practical measures to promote a good water management system at all levels.

XXVII: The Environment

i) The state shall promote sustainable development and public awareness of the need to manage land, air and water resources in a balanced manner for the present and future generations;
ii) The utilisation of the Natural Resources of Uganda shall be managed in such a way as to meet the development and environmental needs of present and future generations of Uganda in particular, the State shall take possible measures to prevent or minimize damage and destruction to land, air and water resources resulting from pollution or other causes;
iii) The state, including Local Governments, shall;
    a. Create and develop parks, reserves and recreation areas and ensure the conservation of natural resources;
    b. Promote the rational use of natural resources so as to safeguard and protect the bio-diversity of Uganda.

Article 237: Land ownership
(2) (b) the Government or a Local Government as determined by parliament by law, shall hold in trust for the people and protect, natural lakes, rivers, wetlands, forest reserves, game reserves, national parks and any land to be reserved for ecological and tourists purposes for the common good of all citizens.

The Uganda Constitution 1995- Objective XXVII provides for the sustainable utilization of Uganda's natural resources i.e. meet the development and environment needs of present and future generation of Uganda. Clause IV of objective XXVII empowers the state, including Local Government to ensure the conservation of natural resources and protect the biodiversity of Uganda.

3.11.2 International and regional obligations

Uganda has obligations to several regional and international environmental protocols, conventions and agreements aimed at sustainable development and biodiversity conservation. The Foreign Treaties and Relations Act, 1998 allows the president or Government authority to enter into international and regional agreements and conventions. Some of these regional and international obligations are listed below:

The Treaty for Establishment of the East African Community

This treaty came into force July 2000 after ratification by Kenya, Tanzania and Uganda. Its outlines a comprehensive system of co-operation among the Partner States in Trade, Investments and Industrial Development; Monetary and Fiscal policy, Infrastructure and Services; Human Resources, Science and Technology; free

movement of factors of production; Agriculture and Food Security; Environment and Natural Resources Management; Tourism and Wildlife Management. Chapter Nineteen spells out co-operation in Environment and Natural Resources Management.

Todate, the Protocol for Environment and Natural Resources Management, and the Protocol for Sustainable Development of Lake Victoria are in place.

The Convention on Biological Diversity

Uganda signed and ratified the CBD on June 12, 1992 and September 8, 1993 respectively. As a party to the CBD, Uganda is therefore bound by the provisions of Article 6 of the convention to develop national strategies, plans or programmes for conservation and sustainable use of its biological diversity and to integrate, as far as possible these strategies into relevant sectoral and cross sectoral plans, programmes and policies. Todate, a National Biodiversity strategy and Action Plan is in plavce with NEMA as the focal point.

The United Nations Convention to Combat Desertification (UNCCD)

Uganda ratified this convention in 1997. This convention emphasises actions to promote sustainble development at the community level. National and Regional Action programmes are one of the instruments in the implementation of this convention. For Uganda the concerns include soil erosion, overgrazing, drought, deforestation, and innapropriate farming systems. The MAAF is the Focal Point.

The Regional Thematic Programmes for Africa include;

- Integrated management of international river, lake and hydro-geological basins;
- Promotion of agro-forestry and soil conservation;
- rational use of rangelands and promotion of fodder crops development;
- Ecological monitoring, natural resources mapping, remote sensing and early warning systems;
- Promotion of new and renewable energy sources and technologies;
- Promotion of sustainable agricultural farming systems.

United Nations Framework Convention on Climate Change

Uganda is a signitory to the UNFCCC and the Kyoto protocol. Through the Clean Development Mechanism of the Kyoto Protocol, various activities and investments to reduce GHG emissions are supported.

The Ramsar Convention, Ramsar (1971)

The Ramsar Convention's objective is to stem the progressive encroachment on and loss of wetlands now and in the future, recognizing the fundamental ecological functions of wetlands, their economic, cultural, scientific, and recreational values. This was ratified by Uganda in 1988.

Convention on International Trade in Endangered Species (CITES), Washington, 1973

The Convention protects certain endangered species from over-exploitation by means of a system of import/export permits. It acceded by Uganda in 1987. The CITES standard forms for permits and certificates are used as a basis for the control of the traffic in specimens and endangered species. The Wildlife Act incorporates CITES as a basis for control of traffic in endangered species.

3.11.3 The EIA Legislation in Uganda

The National Environment Act, CAP 153, provides for environmental impact assessment for projects and policies that may or are likely or will have significant impact on the environment. The third Schedule under this Act lists projects to be considered for EIA. This Act also provides for environmental easements, environmental restoration orders and environmental standards. Among the standards mentioned are the standards for discharge of effluent into water, standards for control of noise and vibration pollution, air quality standards, and the standards for control of noxious smells.

The Environmental Impact Assessment Regulations, 1998, defines the process of undertaking EIA, emphasizes consultations with lead agencies, the public and other stakeholder participation, and post assessment environmental audits. Further under the First Schedule of the EIA regulations, issues for consideration in making an environmental impact assessment have been outlined. Mainstreaming of environmental issues is now emphasized for all Government development policies and programmes and by development partners.

The National Environment Act, 1995 also provides for preparation of guidelines and plans for coordinating environmental disasters, and structures at local levels for this purpose. Under various Regional and multilateral arrangements such as the Nile Basin Initiative, and international conventions such as the CBD, Environmental Assessments and ecosystems approach to environmental assessments have been emphasized. The East African Community under the Protocol on the Environment has developed guidelines for EIA in transboundary ecosystems.

As outlined in the laws and regulations above, Biodiversity considerations are an integral part of the EIAs and Environmental Audits and these are being fully implemented for all eligible projects and programmes. A gap emerging though is post EIA compliance monitoring and Audits. There is limited capacity and resources at District levels for monitoring compliance of projects' approval conditions, and until recently, a lack of Environmental Audit regulations to enable and enforce the requirement for post assessment environmental audits. Besides, much as the National

Environment Act provides for designated Environmental Inspectors, their facilitation remains poor.

However, sometimes, there is competition between developers and Environment, coupled with inadequate political support (often skewed towards economic development projects), which makes the enforcement of the EIA legislation difficult. Besides, the lack of land use policy, the conflicting roles between the technical staff (physical planners/or the lack of) and politicians at all levels and varying appreciation of sustainable land use breeds conflicts.

3.11.4 Institutional Framework for Environmental/Natural Resources Management

Prior to 1986, there was no institution specifically responsible for Environmental Management. The Ministry of Environment Protection was created in 1986, but later absorbed into the Larger Ministry of Water, Energy, Minerals and Environment Protection, which became the Ministry of Natural Resources in 1993, shifting the responsibility of Environmental Management to the Department of Environment (DEP). This Institutional framework then did not give environment Management the Authority and profile it deserved (SOE, 2000/2001).

The NEAP process identified these institutional weaknesses, and its output, the National Environment Management Policy advocated for an Environmental Authority, NEMA, and its structure was provided for under the National Environment Act, CAP 153. Policy and legal provisions have been made to allow for decentralized environmental management, with an emphasis on local participation. This is also provided for in the forestry, water, wetlands, fisheries and wildlife policies.

Several institutional reforms have as well been undertaken in the Forestry Sector establishing the National Forestry Authority and District Forestry Services; in the Agricultural sector, the transformation of National Agricultural Research Organization into a market driven National Agricultural Research Systems (NARS), and the rolling out of NAADS as an extension service provider in Agriculture; in the water sector starting with the Water Action Plan, 1994; For the Fisheries Sector, the recent establishment of Beach Management Units and the planned National Fisheries Authority under the Fisheries Sector Strategic Plan.

The wild life sector falls under the Ministry of Tourism, Trade and Industry. The day to day management of wildlife Protected Areas however falls under the Uganda Wildlife Authority, which is charged with the sustainable management of National Parks, Wildlife Reserves and Community wildlife areas. The Wildlife Authority was established in 1996 by the Uganda Wildlife Act, as a result of the merger between Uganda National Parks with the Game Department, in order to streamline wildlife

management and increase efficiency. The ministry retains the role of policy formulation and overall supervision of the sector.

There has as well been progressive devolution of power to districts and lower local governments provided for under the Local Government Act, 1997. Local environmental committees have been established to sub-county level, in other districts such as Kampala to Parish level. Development of environmental management action plans is done at these lower levels, with involvement of the private sector and civil society in environmental management.

Though resources for environmental management are limited, the government has been able to obtain financial support from a number of development partners to support conservation efforts. The National Environment Act, 1995 provides for tax incentives, user fees and tax disincentives, and eligible fees to support environmental management and encourage good environmental behaviour. These sources are, however, not adequate (SOE, 2002). The National Forestry and Tree Planting Act, 2003, provides for a National Tree Fund, and the Wildlife Act for the Wildlife fund, but these are not operational.

3.11.5 Challenges to Existing Environmental Legislation

One of the main challenges has been the sectoral and centralized approach to legislation, yet management and interactions with these resources is highly decentralized and conservation issues are cross-cutting and thus legislation becomes difficult to coordinate and implement. Wetlands and inland waters, fisheries, forestry, and the wildlife sector are some examples.

Some of the existing legislations and regulations do not reflect recent developments in the status of biological resources, socio-economics, and principles of natural resources and environmental management. Several of the existing natural resources management policies were developed with a conservation background, with socio-economic issues that now emerge in natural resource use conflicts not addressed.

For example, some regulations do not take into consideration conservation efforts on Lake Victoria. Despite the concerns related to over exploitation of the fisheries resource, there is no limitation to investments in fish processing plants, with the number of 17 already operating at 30% capacity or less. This is having an impact of "crowding out" artisanal fishing and is a threat to sustainable exploitation of the fisheries resource. The polluter pays principle whose enforcement has been centralized is rather ineffective. For the effluent and waste discharge regulations, permits and fines do not correlate with pollutant load. The enforcement of these regulations and capacity for monitoring effluent or waste discharges remains weak.

The existing laws do not provide adequate incentives, which would encourage proper utilisation and conservation of natural resources. For the fish sector, legal measures covering small scale processors and traders are vague and licensing requirements apparently do not include them. Only commercial exploitable species are covered, such as sizes of *L. niloticus* and *O. niloticus*, while other endangered species that need protection from over exploitation are not mentioned. For the Forestry sector, commercial tree planting is being promoted, but support to local communities say in form of community nurseries is lacking. Incentives for tree planting that could be catered for under the National Tree Fund are lacking.

Centralized management structure for natural resources has been a weakness, and has involved the parent Ministry, Department in collaboration with District and lower local councils, with local communities delineated from the management of natural resources. Implementation of LVEMP1 was highly sectoral and centralized, hence with the end of its term, capacity at local levels especially of districts, private sector and community based organizations to sustain interventions remains inadequate.

There are, however, various recent cases of involvement of local communities in natural resources management. Local people are being involved in biodiversity conservation strategies through collaborative forest management (CFM) for the case of NFA for instance at Sango Bay and Mabira National Forest Reserve. UWA has developed a community conservation policy, 2004 to enable and strengthen community participation in the conservation of biodiversity within and around protected areas, such as L. Mburo National Park, by signing MoUs with these communities. For the fisheries sector, establishment of Beach Management Units is a way to ensure local participation in fisheries resource conservation. And for wetlands, a number of community wetland management plans have been developed and implemented by local communities with the support of the Wetland Inspection Division.

Community level regulatory mechanisms and bye-laws enforced, emphasizing soil conservation measures, sanitation provisions, controlling illegal bush burning, promoting tree planting and against harvesting of immature fish. The District and Lower Local Governments have an opportunity to strengthen these regulatory mechanisms with appropriate bye-laws and ordinances.

In accordance with the Local Government Act, CAP 243 the central government continues to devolve power and management responsibility to districts and lower local governments. Preparation of environment management and development plans at district, sub-county and parish levels has been accomplished for most of the country, and mainstreaming of environmental issues in development plans is a priority. There is also capacity building support for the Technical Staff (Fisheries,

Wetlands, Environment, Agriculture, Lands) and Political Leaders in natural Resources Management and Impact Assessment.

However, much as the central agencies (NEMA, NFA, MAAIF, MLWE) continue to provide the technical support to the districts Officers, their delinkage with the central authority and absorption into District Local Government set-up is of concern. Funding for natural resources management remains low for activities such as environmental awareness campaigns, preparation of environmental management plans, capacity building of resource user groups, enforcement of laws and regulations, and agricultural extension services.

Local community involvement in natural resources management is recent and its efficacy needs to be evaluated. Recent reports site weaknesses of the system such as selective compliance with regulations and therefore strengthening is required. An example is wide condemnation of drift nets and fish poisoning by local communities whereas beach seines are operated openly without censure, and regulated mesh sizes in use at landing sites around Lake Victoria as noted during field visits.

Besides periodic review of policy, action plans and strategies in environment and natural resources management has not been undertaken as provided for. A case in point is the National Environment Action Plan meant to be reviewed every 4 years, but since 1994, no such review has taken place.

Regional obligations or conventions are limited to advisory, co-coordinating, and liaison such as the LVFO, with no effect on the sovereignty of contracting parties. Some regional conventions have been inoperable due to political instability in the region such as the Kagera Basin Organization (Rwanda, Burundi, Tanzania, Uganda). The River Sio-Malakisi Basin, Mt. Elgon and Sango Bay are other sensitive ecosystems requiring transboundary management. Also linked to this is the Mount Elgon Ecosystem which forms a major catchment for the Sio River and the lake Victoria. For rivers and wetlands feeding into the lake, monographs and decision support systems need to be developed for their sustainable use and management.

3.11.6 Proposed strategies to harmonise identified gaps

- Strengthening local capacity: districts, civil society, CBO's, NGOs to support community driven natural resources management;
- Facilitating enforcement of laws and legislation, and in the implementation of developed environmental and natural resources management action plans;
- Regular review of natural resources management policies, strategies, Action Plans and legislation;
- Support capacity enhancement for post EIA monitoring, particularly at local levels;
- Conduct regional workshops aimed at harmonizing transboundary ecosystem monitoring, including wetlands, natural forests, rivers, rangelands and the mountainous areas;

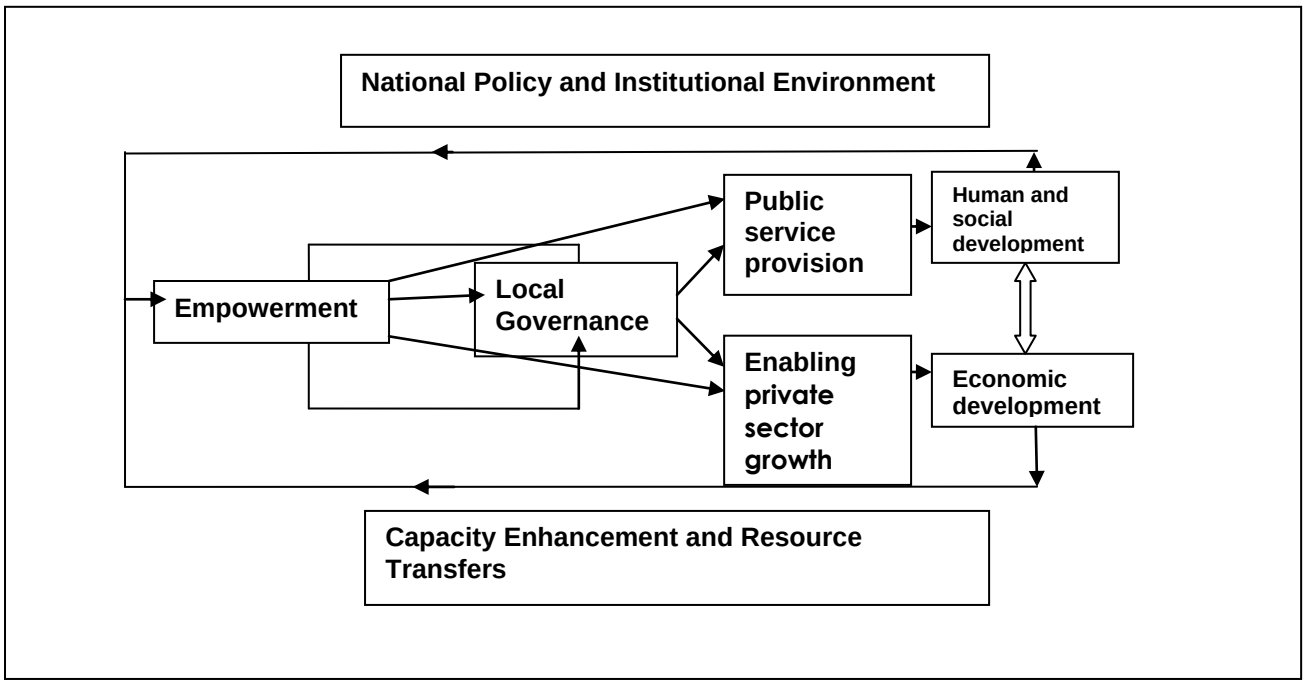
- Support environmental education, public awareness campaigns and communication, particularly relating to sustainable use of the lake Victoria resources;
- Support capacity building efforts for environmental data capture, analysis and dissemination at regional, national and local (district levels) that will aid decision making.

4.0 COMMUNITY DRIVEN DEVELOPMENT IN THE LVB

4.1 CDD Framework

Figure 4.1 below provides a Local Development frame work. Its core elements include empowerment, local governance, local service provision systems, and private sector growth at the local level. The enabling elements include policy and institutional framework, capacity enhancement, and resource transfers to local actors.

Figure 4.1: A Conceptual Framework for Local Development



Source: Social Protection Discussion Paper, World Bank ,2005

Core Elements

- **Empowerment** increases people's opportunities and capabilities to make and express choices and to transform those choices into desired actions and outcomes. People's capabilities to participate effectively in local development are determined not only by individual resource endowments, but also by social capital that provides the basis for collective action.
- **Local governance** is the way authority is organized, legitimated, and employed by and on behalf of local people through planning, decision-making, rule enforcement, and accountability processes. Local governance includes not only local governments and other public sector structures but also a variety of community and civil society institutions by which people organize to act collectively.
- **Local service provision systems**—including public sector, private sector, nongovernmental, and community-based organizations—mobilize and manage resources and produce public facilities and services. The mobilization of local revenues to finance local development is an important foundation for sustainable empowerment and governance as well as for service provision.

- **Private sector growth at the local** level requires improving economic infrastructure and services; strengthening human, social and institutional capital; and creating an enabling business climate.

Enabling elements

- The policy and institutional environment for local development includes formal institutions such as laws, government policies, and organizational systems, as well as values, norms, and social practices that influence people's decisions and behavior.
- Capacity enhancement includes establishing the local institutions through which people and communities participate in local development as well as strengthening of human, social, and institutional capital.

- Resource transfers to local actors—public, non-governmental, and community based organizations—include the provision of investment and operational funding as well as support for training, technical assistance, and information.

Impacts: Local development impacts include not only improvements in social and economic welfare, but also the accumulation of local human, social, and economic capital**.**

4.2 Status of CDD actions in the LVB

In accordance with the Local Government Act, CAP 243 the central government continues to devolve power and management responsibility to districts and lower local governments. To date, all the districts in the LVB have elected Local Governments, with lowest autonomous units being the sub counties. Preparation of District Development Plans (DDP's) has been undertaken to Parish Level, and local needs reflected in the DDP's. The districts are in their second cycle of three year DDP's for 2006 – 2008 financial years. Environment management and development plans at district, sub-county and parish levels has been accomplished for most of the country, and mainstreaming of environmental issues in development plans is a priority.

The existing natural resources management strategies, policy and legislative framework favour community involvement in the management of natural resources, including *the National Environment Management Act CAP 153; the Forestry and Tree Planting Act, 2003; the National Fisheries Policy, 2004; Fisheries Act, 2003; the Wetlands Sector Strategic Plan, 2001; The Forestry and Tree Planting Act, 2003; The Water Act CAP 153.* The Local Governements have as well developed bye-laws and ordinances to ensure natural resources and protected and sustainably used, in accordanbce with the poweres given to them by the Local Government Act.

In terms of local structures for local development and natural resources management, Development Planning committees and Local Environment committees have been

established to parish levels, with the latter functional to subcounty level. There are as well natural resource collaborative management agreements in place for protected areas including National Parks, wetlands, forests, and Beach Management Units along the lake Victoria shoreline and Islands. For the wetlands sector, district wetland management plans have been developed for Mukono, Wakiso and Mpigi, and on-going for Rwizi – Rufuha system covering the districts of Mbarara, Ntungamo, Isingiro, Kiruhura and Bushenyi in the LVB.

In terms of institutional capacity, the central government continues to provide technical support to the local governments, including capacity building support for the Technical Staff (Fisheries, Wetlands, Environment, Agriculture, Lands, Planning) and leadership training for Political Leaders. The Ministry of local Government has pre-qualitied service providers and has developed training modules for the various sectors. NEMA runs a District Support Unit, and this undertakes capacity building in environmental management for the districts. NEMA also runs the Environment Management and Capacity Building Project which supports Community Natural Resources Management Projects. The District Forestry Services now has District Forest Officers employed by the District Local Governments, and for the Wetlands sector, District Wetland Officers have been employed. The Districts now have Directorates of Natural Resources comprising of the former Forestry, Environment, Wetlands and Lands departments.

However, much as the central agencies (NEMA, NFA, WID, FID, MAAIF, MWE) continue to provide the technical support to the District Officers, their delinkage with the central authority and absorption into District Local Government set-up is yet to be operative. Funding for natural resources management remains low for activities such as environmental awareness campaigns, preparation of environmental management plans, capacity building of resource user groups, enforcement of laws and regulations, and agricultural extension services both at national and local levels. The budget for Natural resource interventions and investments is less than 2%.

The Civil society including NGOs and CBOs are key players in realising local development. An inventory of NGO's within the LVB is presented in appendix 3. They have been involved in capacity building activities, training, environmental awareness campaigns, supporting local development planning, infrastructure development, service provision (health and education) and provision of extension services in agriculture and fisheries. However, the capacities of these NGO's need to be addressed, and their spatial coverage and impact among local communities for now remains low.

In terms of financing, the major funding sources for local development have been Local Government Development Programme Grants, and the Poverty Action Fund, the major contributors to these funds have been donors, with the central and local

governments making contributions. Table 4.1 rovides a listing of some of the projects that have targeted community driven development.

The Local Government Development Program

The Local Government Development Programme (LGDP) is a government of Uganda donor funded programme through the Ministry of Local Government. The first phase of this project (LGDP1) focused on enabling Local governments (Districts, Municipalities, Town Councils, Divisions and Subcounties) to develop and apply a range of participatory planning, allocation and investment procedures as mandated under the second schedule of the Local Government Act (1997) through provision of technical and financial support.

The second phase (LGDP II) aims to improve on LGs performance of their statutory service obligations through effective, efficient and participatory LG planning, budgeting, resource allocation, improved accountability and M & E procedures, enhance the capacity of Ministry of Local Government to support the LGs and ensure proper coordination of capacity building and further development of a coherent decentralization policy and implementation**.**

Participation of local communities has been enhanced through establishment of parish development committees, the sub-county and district planning committees, which have greatly improved the process of identification of community needs and implementation of projects..

Plan for modernization of agriculture

A number of interventions are being undertaken to modernize agriculture in the country, and one such action has been through improved delivery of extension services hence the introduction of the National Agricultural Advisory services. NAADS is envisioned to become a decentralized, farmer owned and private sector serviced extension system contributing to the realization of the agricultural sector development objectives.

The key stakeholders include Farmer Institutions, Local Governments, Private Sector, NGOs, The NAADS Board and NAADS Secretariat, The Ministry of Finance, Planning and Economic Development, and The Ministry of Agriculture Animal Industry and Fisheries. Local governments in accordance with the Local Governments Act 1997 are charged with the responsibility of implementing NAADS activities in their respective districts.

Under the farmer driven approach, farmers through their farmer groups and at local levels (parishes, villages) identify, and prioritize viable enterprises through a facilitated participatory process guided by a situational analysis. The criteria for enterprise selection include comparative and competitive advantages for a given locality. These are then forwarded for financing consideration at the sub county and district levels. The local priorities are also guided by national interventions such as agricultural zoning, and strategic enterprise development. To date, a total of 14 Districts in the LVB benefit from NAADS and there is an out cry for scaling up its coverage for all sub counties in the LVB.

The Memorandum of Understanding (MOU) between the Uganda Government and the Co-operating Partners guides the funding and implementation modalities. Co-operating Partners contribute 80% of NAADS budget, Government of Uganda 8%,

Local Governments 10% and Farmers 2%. These shares in NAADS budget will change over the planned 25-year period of NAADS programme. Farmers and local governments will take on increasing funding responsibilities in line with the level of commercialization achieved.

Table4.1: Funding for Community Driven Development Projects, 2006

Fund	Objective	District in LVB
Local Government Development Fund	To improve on LGs performance of their statutory service obligations through effective, efficient and participatory LG planning, budgeting, resource allocation, improved accountability and M & E procedures, enhance the capacity of Ministry of Local Government to support the LGs and ensure proper coordination of capacity building and further development of a coherent decentralization policy and implementation.	All LVB Districts
PMA/NAADS	Poverty eradication through a profitable, competitive, sustainable and dynamic agricultural and agro-industrial sector.	Mukono, Jinja, Iganga, Bugiri, Busia, Wakiso, Masaka, Sembabule, Mubende, Rakai, Mbarara, Bushenyi, Ntungamo and Kabale
Global Environment Facility Small Grants Program	Supports activities of non-governmental and community-based organizations in developing countries towards climate change abatement, conservation of biodiversity, protection of international waters, reduction of the impact of persistent organic pollutants and prevention of land degradation while generating sustainable livelihoods.	All districts, but recent ones include Wakiso, Busia,
Uganda Local Government Development Fund (ULGDF)	To assist Local communities to participate in planning and implementation of their development activities as well as building their capacity so as to be able to manage their development process.	Entebbe Municipality, Wakiso
District Development Support Programme (DDSP)	Alleviating chronic poverty by raising standards of living of the poor and help government in its efforts for PEAP	Kyenjojo
Area Based Agricultural Modernisation Programme (AAMP)	Help to increase incomes among poor rural households through the stimulation of economic activity and contributions to the modernization of smallholder agriculture in the target area.	Kabale, Ntungamo, Mbarara, Bushenyi, Kyenjojo and Ssembabule.
Farm Income Enhancement and Forest Conservation Project	To improve rural livelihoods and food security through sustainable natural resource management and agricultural enterprise development.	Wakiso, Masaka, Sembabule, Rakai, Kiboga, Kyenjojo, Mbarara, Kabale, Bushenyi, Ntungamo,Jinja, Bugiri, Iganga
Wetland Sector Strategic Plan Support Project (WSSP -BTC)	Management and Sustainable Utilisation of Wetland Resources	Mbarara, Bushenyi, Isingiro, Kiruhura, Ntungamo
Environment Management and Capacity Building Project, NEMA	Preparation of District Environment Action Plans, and support to selected environmental projects	Wakiso, Kampala, Mpigi, Mukono, Jinja, Rakai, Masaka, Mbarara, Ntungamo, Kabale, Bushenyi, Busia, Iganga
Energy for Rural Transformation [ERT] Programme	Help to increase the access of rural electrification from the current 1% to at least 10% by the year 2012 using the private sector and commercial led modality- as one of the ways to improve incomes among the private sector, the poor rural households through the stimulation of economic activity and contributions to the industrialization and to safeguard our environment.	All districts

GEF small grant projects

The SGP is funded by the global environment facility (GEF) as a corporate programme. It is implemented by the UNDP on behalf of the three GEF implementing agencies (World Bank, UNEP, and UNDP) and executed by the UNOPS.

Launched in 1992, SGP supports activities of non-governmental and community-based organizations in developing countries towards climate change abatement, conservation of biodiversity, protection of international waters, reduction of the impact of persistent organic pollutants and prevention of land degradation while generating sustainable livelihoods.

In participation with these local organizations, SGP has demonstrated that even with small amounts of funding (SGP grants are less than $50,000), local communities can undertake activities that will make a significant difference in their lives, local empowerment and contribute to global environment benefits.

SGP grant-making is directed principally towards poor and marginalized communities, through their own community-based organizations (CBOs) or assisted by local or national non-governmental organizations (NGOs).

SGP grant-making, guided by country programme strategy developed on the basis of a global strategic frame work in tandem with Uganda's priorities, has funded over 90 initiatives by January 2007. Table 4.2 provides a list of some of the projects supported or recently implemented in the Lake Victoria Basin.

SGP Uganda supports interventions that contribute to global environment benefits, sustainable livelihoods, poverty reduction and local empowerment within a georgraphic and thematic focus.

The principal objectives of the Small Grants Programme are to:

- Develop community-level strategies and implement technologies that could reduce threats to the global environment if they are replicated over time.
- Gather lessons from community-level experience and initiate the sharing of successful community-level strategies and innovations among CBOs and NGOs, host governments, development aid agencies, GEF, and others working on a regional or global scale.
- Build partnerships and networks of stakeholders to support and strengthen community, NGO and national capacities to address global environmental problems and promote sustainable development.
- Ensure that conservation and sustainable development strategies and projects that protect the global environment are understood and practiced by communities and other key stakeholders.

Table 4.2: GEF SGP projects in the LVB as per January, 2007

Project name	Objective	Grantee/District
Katonga Wetlands Conservation Project	Community Eco-tourism project, Promoting an intergrative management process for sustainable community development and biodiversity conservation.	Katonga Wetlands Conservation Association, 1998 - 2001
West Bugwe Forest Conservation Project	Joint Forest Department and Community Conservation project. Promoting collaborative management systems that conserve biodiversity, strengthen local institutiions, empower women, support small businesses and address social and environmental needs	West Bugwe Conservation Association, 198-2000, Busia District
Mabira Green Ventures	A community based ecotourism and conservation programme within Mabira Forest Reserve focusing on provision of visitor management by the local communities, and promotion of community conservation education	Mabira Forest Integrated Community Organization, 2005 – 2007 Mukono District
Nyabushozi Photovoltaic Demonstration Project	To promote the adaptation of renewable energy technology, particularly photovoltaic energy technology by removing barriers and reducing installation costs based on a commercial approach.	Kaaro Cooperative Savings & Credit society, 2004 – 2006, Kiruhura District
Joint Effort to Save the Environment	To implement an analog forest conservation project in Kihura sub-county where Matiri Forest Reserve and numerous private forest patches are located	JESE ASAFCO, 2006 – 2007, Kiruhura
Bugoma Community Ecological Sanitation	Prevention ofwater pollution, implemented in the parishes of Bbeta and Kagulube, Mugoye Sub County, Kalangala District	Ssesse Health Effort for Development, 2006, Kalangala District
Minani Fruit Tree Project	Prevention of land degradation	Fruits and Tubers Farmers Group, Iganga District, 2006 - 2008
Conservation of Swamp Forest Biodiversity	Promoting the introduction of rattan cane, Nagojje and neighbouring parishes	Centre for Integrated Development, Masaka District, 2006 - 2008
Combating Land Degradation & Decline in Soil Productivity	Prevention of soil erosion	Kageye Farmers Cooperative Society, Wakiso Distict, 2006
Waste Management in Busia Town Council	Prevention of water source pollution	Youth Environment Service, Busia District, 2005 - 2006
Environmental Management in Sango Bay	To improve agricultural practices and environmental conservation as well as promoting income-generating activities	Community Integrated Development Initiatives, Rakai District, 2005 - 2006
Management of Natural Resources along River Sio	Prevention of river siltation	Christian Association for Disadvataged Children and Environment, Busia District, 2006 - 2007
Luzira Water Hyacinth Art-Craft Training Project	Removal and utilization of water hyacinth for art-craft making	Uganda Prisons Service, Kampala District
Solar Energy for Improved livelihoods and Conservation of Ssese Islands of Lake Victoria	Preventing forest degradation	Ssese Community Development Association
Nyakigufu Community Based Development and Conservation Project	Promotion of sustainable forest community based activities	Nyakigufu Rwoho Development Association, Ntungamo District, 2005 - 2007
Commercialization of Lemon Grass Cultivation and Processing	Controlling soil erosion, and value addition to oil product	Ntungamo Women's Efforts to Save the Environment, Ntungamo District, 2005 - 2007

Note: *these are selected projects of the 90 implemented o on-going countrywide as of January 2007 under the SGP since 1992.*

4.3 CDD under LVEMP I

Under LVEMP I, community participation was emphasized in the design and implementation of the Wetlands, Catchment Afforestation, Micro Projects and Land Use Management Components. Community awareness raising and training, formation of community groups to facilitate mobilization, Technical Support from the project, involvement of the NGO's, and linkage of the interventions to the socio-economic realms as an incentive for participation were key to success of these interventions. The micro-projects implemented under LVEMP I have demonstrated local communities can be great partners in the management of lake Victoria Basin natural resources.

A success case under the Catchment Afforestation Component was the promotion of tree planting, with upto 24 community nurseries established. CAPP limited its involvement to the provision of tree seeds while supporting the private sector and community groups with technical support. Some success cases under this approach were 280,000 seedlings planted on 200 hectares in Kifamba, and 25 hectares of *Pinus oorcarpa* and *Eucalyptus grandis* planted on the hill slopes of Nyanga and Kisaasa all in Rakai district. The concern though has been the sustainability of these initiatives, including the technical, institutional and financial sustainability of this intervention among the local communities.

The Wetlands Component demonstrated the strengths of community driven actions in conservation and restoration of wetlands, and their sustainable utilization for livelihoods improvement. The local communities participated in the development of wetland management plans, and this component promoted pilot projects in sustainable utilization of in Sango Bay, Busia, Napoleon Gulf and Murchison Bay. The communities also benefited in pilot projects for promotion of cane and phoenix, fish farming in Kalisizo and Busia, Ecotourism at Kakuto, as well as training in crafts improvement. In some cases such as Nabugabo, a crafts market was built for the communities. Several community groups for wetland management and resource utilization were established and supported.

The land use component activities were concentrated in Rakai District where soil erosion was predominant, focusing on improved land use practices. The communities have since benefited in terms of improved yields from their plots. The use of demonstration sites (23 in Rakai district), and community representatives as field workers has enhanced adoption of appropriate technologies for soil erosion control. The communities also participated in generation of soil erosion data and rainfall on their run-off demonstration plots.

For the water hyacinth component, communities participated in water weed manual removal with support in form of tools and safety gear from the LVEMP. With the establishment of BMUs, community involvement in monitoring if boats were provided, and employment of youths utilizing revenues generated by the BMUs is possible.

The industrial and Municipal waste management component undertook hygiene and sanitation awareness campaigns, and constructed some facilities. Utilisation of NGO's and CBO's should be emphasized in future, as well as community participation through Parish Development Committees in the choice and siting of water and sanitation infrastructure.

The Water Quality and Ecosystems Management component has sub-components covering water quantification, sedimentation, eutrophication, water quality monitoring, and water quality modeling. Participation of local communities in this component was low, probably because of the centralized nature of management of the water resource. Vandalisation of sediment traps, gauging equipment and hydrometeorological stations used for water quantification points to a lack of sensitization and community appreciation of their value. The lack of water committees provided for in the Water Act CAP 152 further aggravates the situation. However existing local structures such as environment management committees,BMUs or LC structures could be utilized in data collection and protection of the gauging and hydro-meterological stations. Dissemination of generated information to the communities under this component was not undertaken, yet this data impacts on the community day - to - day activities.

The fisheries research component utilized local indigenous technical knowledge, and a major output was the establishment of BMUs, which is now a success case in community involvement in natural resources management. A statutory instrument, the Fish (Beach Management) Rules 2003 was developed and is operational, and the Guidelines for Beach Management Units in Uganda (2003) developed and published by MAAIF. NGO's have participated in establishment and strengthening of the BMUs, particularly UFFCA.

The micro-projects component aimed at strengthening the capacity of local communities to identify and priorities needs, plan and implement solutions, management and maintain investments, and apply lessons learnt to future needs. This component registered the highest community participation with upto 122 projects in 74 communities.

Table 4.2 provides a summary of actions required to strengthen community involvement in protecting the Lake Victoria basin natural resources

Table 4.2: Required Actions to strengthen local participation in Natural Resources Management

Natural Resource/component	Actions to strengthen Community involvement in Natural Resources Management
Wetlands Management	• Supporting development of community wetland management plans and their implementation; • Supporting establishment of community resource user groups; • Training of resource user groups in craft making; • Supporting propagation of rattan cane and wetland restoration efforts; • Supporting community ecotourism groups
Catchment afforestation	• Supporting extension services at sub-county level; • Establishment of community nurseries, and training of communities in their management • Supporting Local Governments in the development of appropriate bye-laws for tree planting;
Water Resources	• Utilising existing community institutions in the protection of gauging equipment and meterological stations, and in data collection (LC's, BMUs, Local Environment Committees)
Fisheries Research and Management	• Training of BMUs to undertake their manadate; • Supporting NGO's involved with improving the plight of fishing communities; • Awareness and education of the fishers
Land use management	• Establishing demonstration sites in all districts for good land use practices; • Training community field workers; • Utilising NAADS structures and farmer institutions to disseminate good land use practices.
Water Hyacinth and invasive weeds control	• Providing tools and safety gear for water hyacinth and invasive weeds removal; • Facilitating BMUs in water hyacinth and invasive weeds, including provision of motorized boats; • Supporting BMUs in the maintenance of weevil rearing centres • Supporting BMUs in the training of youths in water weed removal and monitoring, payed by BMUs
Micro-Projects	• Develop capacities of sub-county and Parish Development Committees, community groups in project Design and Monitoring
Industrial and Municipal waste management	• Supporting NGO's, CBO's in hygiene and sanitation campaigns; • Supporting efforts to impove water and sanitation coverage at landing sites and rural growth centers

4.4 Capacity Assessment – Civil Society, NGO's

A list of NGO's in the LVB and districts of operation is provided in annex 2. Currently 3,499 NGOs are currently registered with the NGO Registration Board. NGOs are supposed to submit annual returns, budgets and work plans.

The main faith-based groups are not registered as NGOs although they are the largest non-public service providers of social services – principally health and education. They include: the Catholic Church, Church of Uganda and the Uganda Muslim Supreme Council. Certificates are issues on a I, 3 and 5 -year basis. For control and monitoring purposes, no life certificates are issued. A recent NGO sector study conducted under the auspices of the Office of the Prime Minister and funded by the World Bank estimates that about 30% of the registered NGOs are actually operational. Only 30% of NGOs surveyed are faith-based.

With the exception of traditional faith-based organizations, the NGO sector is still in its infancy, and most NGOs are small. Many remain unspecialized and unfocused. Many consider themselves holistic and favor capacity building, advocacy and lobbying to direct service delivery.

Ugandan NGOs are funded primarily through international NGOs and donors. While the economy is not considered strong enough to support such a number of NGOs, the average NGO generates about 2.5% of its funding from members and individual donation.

Ugandan NGOs are heavily networked into each other. Some 72% of those surveyed belonged to a local NGO network or umbrella organization. The most commonly cited are the Uganda National NGO Forum (67%). Some 38% of Ugandan NGOs are also members of international or regional networks. Benefits from networking include meetings, database exchange and communication services. Some 70% of NGOs surveyed are in partnership with at least a Government ministry.

Several of these NGOs now offer micro-finance services, and agricultural extension services under NAADS. A number of them engage in environmental education and awareness campaigns, others in natural resources interventions such as implementation of wetland management plans, tree planting and pollution prevention. For some districts such as Iganga, an environmental NGO Forum has been formed. For the Fisheries sector, UFCA, ECOVIC, and UFAWU that operate among the fishing communities give an opportunity for partnership in community driven development under LVEMP. These have been involved in the formation of BMUs and their strengthening, and in advocating for the plight of these communities.

The geographical and technical areas of coverage of NGOs, however, remain low, and capacities limited to guide community driven development initiatives. For the implementation of LVEMP II, it has been proposed that an assessment of capacities of these NGOs be undertaken, and competitive bidding undertaken for funds available

targeting community development efforts in which the NGO's will be critical partners.

4.5 Micro-finance for CDD

The micro-finance industry within the LVB region is rapidly expanding with steady out reach in the rural areas, though in some parts of LVB – rural set up, the presence of micro-finance is not visible. This situation is attributed to geographical, economic and social facts. The major reasons for out reach usually rotate around the factors blow:

- ❖ Location (Geographically);
- ❖ Economic activities;
- ❖ Population distribution;
- ❖ Demographic set up;
- ❖ Infrastructure;
- ❖ Utilities;
- ❖ Social Composition;
- ❖ Political reasons.

The micro-finance Industry has been seen as a primary agent for resources mobilization and distribution in the different sectors of the LVB economies. Beneficiary sectors include the service industry, agriculture, business, education and health. Despite the funding received in loans categories, some sectors have not been able to be funded, mainly because of the complexities of the funding options available. The Lake Victoria Basin has been an open arena for all forms of investments and activities, without proper protection. With the ongoing development efforts, micro-finance is an important intermediary of funds, providing as a conduit of channeling funds from the sources to the destinations i.e. from the Government, Donors, Development Agencies to the users of loans and Grants such as local SMEs.

Informal Practices of Rural Credit

Within the LVB – states, many people and institutions in the rural areas, tend to use credit from informal – finance institutions and individuals often operating without licences and not – regulated. These institutions and individuals extend loans at very high interest rates up to 300 % per annum. These practices have ruined the rural borrowers and are at times cited as the cause of poverty and have tended to cripple developments efforts in the rural areas.

On the other hand, the rural populations have formed groups, which mobilize savings among themselves and give loans to individual group members on a rotational basis.

This practice is also common in urban set ups, examples include (Nigiina for women). Other practices include subleasing of agricultural land for rentals.

Rural Credit Finance

The formal rural credit finance in the LVB – region and in Uganda in particular has been mostly provided by micro-finance institutions through the NGO's. The funds are accessed by individuals with established small businesses (SME) usually through organizations in which they are registered members.

There are several Membership Groups such as SACCO's, ASCAs, FSAs ROSCAs, and other such organizations. Loans are extended on a rotational arrangement with each member policing each other to pay back in time. Members hold shares within the association / organization.

The Micro Finance Institutions are registered and licenced by government. They offer credit to small business owners like charcoal selling, tomatoes, agricultural loans (poultry, piggery etc). Because of the donor funds and bank loans which they depend on, they are subjected to rural outreach planning. This subsequently benefits the rural populations.

There has, however, been a service concentration of these MFI's in urban areas, with the rural areas inadequately covered. The need for sensitization and capacity building for rural credit users is crucial. Cases of loans used for other purposes than intended as a major reason for failure to pay back were revealed during the field visits to the districts. Besides, the saving culture remains poor. Box 4.2 provides some of the field findings.

The Micro-Finance Institutions

Micro-finance institutions per se refer to all those financial institutions, offering micro-finance services to the population. In the context of the FIA-2004, and MDI-ACT 2003, these are institutions within Tiers III – IV Micro Deposit taking institutions) and micro-finance institutions which are not regulated by the central bank.

The micro-finance institutions include CBOs and NGOs companies, SACCOs, ASCAs, ROSCAs, FSAs, MDIs, credit institutions, housing finances and commercial banks – engaged in micro-finances services to the public.

The regulated financial institutions in Uganda today are categories as Tier's I– III.
Tier I – Commercial Banks
Tier II – Credit Institutions / Housing Finance
Tier III – Micro-Deposit Taking Institutions

There, however, individuals / companies and institutions which offer micro-finance services to the borrowers. These transactions are financially unregulated and are characterized by high interest rates but are easily accessible. As a result this mode accessing rural credit account for a rapidly expanding loan and credit transactions in the LVB region.

The regulated institutions have equally embarked on an expansion and out reach mission to the rural populations. This development is still gradual as their credit transactions are still in the urban centers. Thus the slow growth of formal credit in the rural areas is mainly due to the fact that regulated micro-institutions provide loans and credit with several conditions attached and requiring collateral securities that are not always available in the rural areas.

The Tier III – Institutions and Tier IV are known to have been and still depend on donor funds and borrowing as their major source of liquidity. These institutions, however, have an expansive outreach both in the rural and poor urban areas and hence provide potential means for encouraging domestic savings, among other benefits.

Box 4.1: Field Results on Microfinance Institutions

- There is an increasing presence of micro-finance institutions in the districts visited, with each having a minimum of five institutions. There service provision is however limited to the urban centres, with little presence in remote areas, such as fish landing sites. Several NGO's also provide these services;
- The distance between the institution and the clients makes it difficult for the institution to monitor the utilization of the loan.
- There are cases of diversion of funds to unproductive ventures like payment of school fees, paying bride price, cross border smuggling. Also poor saving culture in rural areas, hence the need for extension services to beneficiaries on loan utilisation;
- Resource user groups or organizations (farmers, artisanal miners and fishermen) are becoming viable units for security of loans accessed by their members;
- Natural resource based activities now attract funding, an example is CMF Mukono Branch, which provides services to Agriculturist especially Sugarcane Out growers, cattle keepers, Stone quarrying, and Fisheries (both capture and aquaculture); Busia Rural Micro Finance Co-operative and Uganda Finance Trust (U-Trust) Busia Branch supports: Mining, Agriculture, Fishing activities;
- Revolving funds, such as the entadikwa scheme seem more popular to rural beneficiaries;
- Cases of temporary clients such as fishermen and border communities make loan recovery difficult; For agriculture, seasonal variations and extreme cases of drought are of concern;
- High interest rates charged by Banks force the micro-finance institutions to charge high interest rate, a burden that is born by its clients, limiting accessibility of credit to rural borrowers;
- Lack of collateral among the rural communities (land titles) makes it hard for them to acquire credit;
- Capacity building of micro-finance institutions is being undertaken by the Ministry of Finance, SUFFICE;
- Under the Rural Development strategy, institutional development of farmers groups and revolving funds (ISFG) are being provided to farmers' groups. Credit and savings schemes also receive support form service providers under NAADS. An example is the South East Private Sector Promotion Enterprise Ltd in Busia.

4.6 Funding Constraints

Funding constraints for CDD range from local to national levels. It has been observed that many microfinance institutions have not funded business / investments in the natural resources sector, such as agriculture sector and forestry, due mainly to the natural risks associated with these sectors. On the other hand, the populations and SME's within the LVB – region have not been equipped with the necessary skills to come up with appropriate and competitive proposals justifying funding. Though participatory approaches to development are being promoted in implementation of NAADS, and the preparation of Local Development Plans, there is need for capacity building to harness these opportunities. There is also need to scale up successful interventions and to strengthen competitive procurement procedures so as to enhance the efficiency of Local Government service provision by NGO's or CBO's, and ensure funded projects have impact among local communities.

A major challenge for the rural credit financing relates to apparent lack of distinct funding requirements by the intended beneficiaries. Past experiences have indicated lack of commitment by the beneficiaries to manage properly the funds extended by Government such as the *Entandikwa Scheme*. The challenge to the MFI's include not only ensuring increased access to credits to local SME's, capacity building for intermediary agencies, but also to train and sensitize the beneficiaries about their individual collective responsibilities for the beneficial use and repayment of the funds lent to them.

It has been observed that a number of funds for Natural Resources Investments have been available i.e. the National Tree Fund, the Wildlife Fund, the National Environment Fund. These resources have, however, remained redundant or not fully operationalized. But, there are cases of effective use of these conservation funds from which lessons can be learnt. For instance, the Saw Log Production Scheme provides incentives to the tune of 60% of the costs of establishing tree plantations to commercial farmers (minimum of 60 acres). A number of NGO's have been able to attract funding for conservation and development activities i.e. the ECO-Trust and Environment Alert.

4.7 The Need for an Investment Fund to support CDD

The Lake Victoria basin is richly endowed with diversified natural resources presently not evenly exploited to ensure sustainable use. The rich agricultural soils in the basin are mostly cultivated traditionally with little concern about soil conservation; the waters of the lake over fished and deeply polluted; trees; wetlands over used respectively for wood fuel and for the expansion of traditional farming. The solution to this endemic situation is to encourage and facilitate modern farming practices and

promote especially through community driven development projects that conserve the endowment heritage of the lake basin.

It is this background that calls for and justifies the establishment of an investment fund that will assist mobilize the requisite resources focused on sustainable economic and social development of the Lake Victoria. The resources of the fund will provide catalytic support to various stakeholders in the basin, particularly to the poor farmers and traders. The fund activities can be envisaged to bring about certain positive externalities like encouraging the outreach expansion of the micro-finance activities away from urban and peri-urban concentration as is the case at present. While the fund will initially concentrate on small CDD projects and programmes, its activities would nonetheless assist identify large projects especially infrastructure, agriculture and communication projects that merit substantial investment intervention from external financing. The details of the proposed investment fund are provided in chapter six of this report.

4.8 Improving the enabling environment for CDD

The enabling environment for community driven development encompasses the policy and institutional environment for local development including laws, government policies, and organizational systems, as well as values, norms, and social practices that influence people's decisions and behavior. It has been noted above the existing structures for local governance, including regular elections for local leaders. However, local players such as CBO's, NGO's, civil society groups, and the private sector remain thin on the ground. Social services provision and infrastructure also remains poor in rural areas.

This study emphases formation of resource user groups and CBO's at local levels through which financing for development could be channeled. Capacity building at all local governance levels and accountability for funds released for development purposes at the local levels is emphasised. Advocacy activities by NGOs for the enabling environment for CDD, such as UFCA for the plight of fishing communities, should as well be supported.

For natural resources management, there is need to strengthen laws and regulations on local management and their enforcement. These include bye-laws and ordinances for natural resources management. Besides consultative processes need to be improved, and the people empowered to manage their natural resources. Such an example is through the development and implementation of community wetland management plans.

4.9 Enhancing capacities for Local Development and natural resources management

Capacity enhancement goes well beyond technical and professional training. More effective collaboration between public sector and nongovernmental organizations, more responsive and legitimate forms of social capital, better performing

organizations, and individuals more capable of working together to solve problems also enhance the capacity for local development and natural resources management.

There are initiatives identified during field visits that are meant to enhance local development. These include on-going formation of farmers' associations, strategic farmer enterprises, private- public partnerships, Beach Management Units formation, the existing Local Environment Management Committees and the Parish Development Committees. People participate in local development processes through collective action. Community organizations, resource user groups, and other voluntary associations, are vehicles for local people to engage in participatory planning and public decision making, in service delivery, and in other local governance processes. These institutions also provide opportuniies for collective mobilization to solve specific problems through direct action, such as self-help infrastructure improvement or maintenance, community-based regulation of natural resource use, and cost sharing for social or economic support services not provided by the public sector.

These efforts need to be strengthened and scaled up to ensure sustained growth of social capital, which is key to improving peoples livelihoods and ownership of development processes.

Public awareness and communication, as well as improved knowledge and skills of individuals who are agents of local development and natural resources management —whether as community members and leaders, association officeholders, NGO staff, local government officials, civil servants, or entrepreneurs will be crucial. BMUs already benefit from some NGO capacity building initiatives such as UFCA, and organised farmer groups from private sector service providers. The extension services for natural resources sectors such as forestry and agriculture need to be strengthened.

4.10 Providing Resources for Local Development

Section 5 presents proposed areas of investment/interventions to improve livelihoods of communities in the lake Victoria basin and also ensure sustainable development and protection of this natural resource base. The priority areas identified include agriculture and livestock, fisheries, water resources, wetlands, mining, eco-tourism, forestry around which the peoples' livelihood in the LVB revolves.

In section 6, an investment fund has been proposed. Its organization and access windows for the funds have been proposed. Community Driven Natural Resources Investments and Interventions of upto US$ 4 Million has been proposed over 5 years – 2007 to 2012. This level of investment is hugely justified by the costs of environmental degradation in the LVB.

Financing CDD also encompasses provision of technical support and capacity building at local levels among the CBO's and public service providers, improved extension services, improved infrastructure and service delivery, and providing opportunities for information sharing and exchange. Given the competitive nature of the proposed fund, capacity building of local groups in project design and monitoring will be crucial.

5.0 PROPOSED INTERVENTIONS/INVESTMENTS: SHORT AND LONG TERM

This chapter presents proposed priority interventions / investments needed to promote the Lake Basin environmental health and sustainable economic growth. These include investments in agriculture and livestock, fisheries, mining, ecotourism, forestry, water resources, wetlands resources management, water supply and sanitation, water hyacinth and other invasive weeds control, the health sector and in infrastructure development including energy, transport and communication. The enabling environment for these investments has also been discussed including infrastructure development, cross cutting issues impacting on sustainable environmental management including institutions and governance, related economics incentives, social and behavioural changes, research and technological inputs as well as required decision supporting tools.

Under chapters 3 and 4, key issues requiring interventions have been identified. Table 5.1 presents key transboundary issues identified by the SAP and in chapters 3 and 4 of this report. Identification and prioritization of critical areas of interventions reflect both national and regional policy, current actions by the lead agencies in these sectors, and consultations with stakeholders. The PEAP, PMA, EAC strategy, the Millennium Development Goals (MDG's), District Development Plans (DDPs), Vision 2025, lessons leant under LVEMP 1, and the results of the RTDA study and the SAP, have been a reference guide in the prioritization of the proposed interventions.

Coverage of on-going interventions and levels of funding have been considered in refining the list of projects to be funded under LVEMP II. Synergies have been proposed with respect to existing National and Transboundary projects.

The logical framework for the proposed interventions is presented in Annex 1, and the complementary detailed budget in Annex 2. Presentation of areas of intervention is sectoral, but covers the thematic areas in the SAP, including Ecosystems, Natural Resources and Environment; Production and Income Generation; Living Conditions and Quality of Life; Population and demograpghy; and, Governance, Institutions and Policies.

Table 5.1: Overview of Key Transboundary issues per SAP thematic area

SAP Thermatic area	**Key transboundary issue**	**NR Intervention/investment gap – chapter 3 and 4**
Ecosystems, Natural Resources and Environment	1. Pollution and eutrophication of the lake from domestic, urban, industrial and agricultural activities 2. Climate change and water balance (e.g. declining water level as a result of reduced catchment inflow and rainfall around the lake, floods, droughts and variability, including disaster management) 3. Loss of acquatic and terrestrial biodiversity (e.g reduction in fish species,flora and fauna) 4. Deforestation and wetland degradation) 5. Waterhyacinth and other invasive species.	1. Poor land use practices, soil erosion 2. Limited water resources monitoring and assessment; 3. Water scarcity and decreasing lake water levels; 4. Fisheries biodiversity threatened; 5. Deforestation; 6. Wetland degradation; 7. Increased proliferation of the water hycinth and other invasive weeds
Production and Income generation	6. Fisheries-declining fish catches 7. Inadequate infrastructure (e.g rural road network, energy sources, safety of navigation 8. Inadequate use and adoption of appropriate technology and research 9. Crop production and livestock issues (e.g overstocking, diseases, low yields), including inappropriate market system and post harvest losses	8. Subsistance agriculture and limited extension services; 9. Limited dissemination of improved technologies, including crops and livestock; 10. Declining fish catches, increased effort 11. High post harvest loses for fish, agricultural and livestock products; 12. Inadequate transport, communication, storage and value addition infrastructure for natural resources products; 13. Limited micro-finance for Natural resourses investments
Living Conditions and Quality of Life	10. Poor access to health facilities and programmes (particulary HIV/AIDS, malaria and tuberculosis and typhoid) 11. Inadequate safe water supply and sanitation system) 12. Low level of formal education and high illiteracy rates	14. Low safe water and sanitation coverage; 15. Low capacity of local community groups and local governments
Population and Demography	13. High population growth rate (includes low access to antenatal and birth control facilities) 14. Poverty and increasing number of marginalized people (e.g. unemployed, orphans, displaced etc.) 15. Rural to urban migration	16. High population growth rates 17. High poverty levels
Governance, Institutions and Policies	16. Conflicting and inadequate policies, laws, law enforcement and institutional frameworks on natural resources management and utilization; 17. Inefficient and poor land use, exploitation of natural resources and spatial planning; 18. Low level of environment governance and community involvement.	18. Limited capacity at national, district and local levels for enforcement of environmental legislation; 19. Low level of community involvement in natural resources management;

5.1 Agriculture and livestock

Agriculture is the economic mainstay of the majority of the inhabitants of the LVB. The acreage averages about one hectare of land, and practice subsistence extensive agriculture using basic tools – the hoe and panga, without appropriate inputs. Investments and interventions in the agricultural sector will target and benefit the majority of the LVB population.

Current Products

Peasant holdings produce bananas, potatoes, cassava, vegetables and fruit, cereals like rice, sorghum, groundnuts and peas enough for household needs and the surplus for sale. Results in chapter 3 indicate an increased adoption of improved technologies, growing of non-traditional crops and increased output per acre cultivated. The rolling out of NAADS presents an opportunity for improved agricultural extension services and production. A few people keep livestock on a large scale producing milk and beef, but mainly in the districts of Mpigi, Rakai, Mbarara, Isingiro Kiruhura and Ntungamo. There is hardly infrastructure in place to add value to the agricultural and livestock produce and linking these to markets.

Promoting Non-Traditional Crops and their value addition

The concerned crops embrace low volume high value crops, such as vanilla, cardamom, pepper, pineapples, mulberry trees for silkworms, avocado, mangoes, apples, passion fruits, water mellons and mushrooms. These require high level of management especially to encourage and exploit their export potential. An example is the country's success in flower investment and export to the EU market.

There are cases of success in the growth of these non-traditional crops, including mangoes and pepper growing in Iganga (by Minani Fruit and Tuber Farmers' Association), Grapes in Mbarara and Kabale districts. Some of these products are highly perishable and require appropriate handling including initial processing, storage and transportation facilities, as well as well targeted markets. Besides the inputs such as seeds, cuttings and silkworms, and extension services would require sufficient investment, and call for easily available working capital and long-term investment financing. For silk farming, the establishment of a processing plant at Kawanda and Bushenyi offers opportunity to the farmers in Mpigi and neighbouring districts, and others in western Uganda.

In this sub-component, the following areas merit support for additional intervention/investment:

- Establishment of and support to existing farmer groups engaged in these non-traditional crops, focusing on one strategic enterprise per district or region;
- Purcahse of improved seeds/breeds, inputs and extension services through various subsidies to the established farmer groups;

- Support public – private partnership or SME's in the development of infrastructure for processing, storage and market linkage of these products.

Investing in acquisition and dissemination of improved Technologies

Appropriate improved technologies are being promoted by NAADS and their partners, various projects such as FITCA, NGO's and the traditional agricultural extension system. Research on relevant technologies is undertaken by NARS institutes, Zonal Research Institutes and Agricultural Research and Development Centres, each having different competencies. Linkage between farmers – the clients and research output has in the past been very weak.

Dissemination of the improved technologies is undertaken by NAADS and private agricultural service providers. Adoption of these technologies is yielding results and cases to point out are farmer driven strategic enterprises in the various districts and subcounties in the LVB including improved breeds of piglets, Boer goats, dairy cows, pineapples, upland rice, groundnuts serenut 1-4 series, cassava mosaic resistant varieties, and improved banana varieties. Other than supply of improved seeds, farmers can equally benefit from training in better farming methods, soil conservation and in the control of diseases and pests.

Access to improved technologies remains limited, and the use of revolving funds under PEAP or ISFG at district level for accessing improved seeds by farmer groups has been slow to create impact. Besides higher level organisations for farmers are either weak or non-existent, requiring great effort in institutional development. Subsidies or credits in form of revolving funds will be required to facilitate the adoption of these technologies and to finance extension services. In this regard support is required in the following activities;

- Production and distribution of high quality seeds and planting materials, and improved breeds of livestock;
- Subsidized extension services to realize a sustainable increase in the productivity and quality of livestock and crops;
- Capacity building for the private sector and NARS in the production, supply and distribution of high-quality seeds and other planting matereals, and improved livestock;
- Rehabilitation of livestock improvement infrastructure including valley tanks, dams, and dipping tanks at subcounty and parish levels;
- Establishment of on-farm demonstration sites.

Investing In Extension Services

The rolling out of NAADS has been seen as an opportunity to improve extension services in agriculture. At the moment, capacity has not been built among the farmers to purchase extension services available on the market, nor the improved

technologies. Funding is still required to extend services to the farmers as their institutional capacity (Farmers' Organizations) is developed, including having community based facilitators at parish level.

Capacity building is required especially among the extension service providers to ensure they can adequately address the needs of farmers. The coverage should be of all production areas – from planting to prevention of post harvest losses, value addition and marketing. The existing redundant capacity needs to be harnessed including agricultural officers at sub-county level paid for by the District Local Governments.

Recommended areas for intervention or investment include;

- Strengthening existing and formation of new farmer institutions and development of capacity for effective advisory services delivery;
- Support market linked farmer enterprises (strategic enterprises);
- Support enhancement of private sector capacity for provision of appropriate and effective advisory services to farmers;
- Build extension capacity in the control and prevention of major animal and corp diseases/pests;
- Support outreach activities by researchers (NARS Institutes, Zonal Research Institutes, Agricultural Research and Development Centres, Academic Institutions) to farmers and extension service providers.

Investing in Mechanized Agriculture and Value Addition

The districts in the LVB are predominantly practicing subsistence agriculture, with a few cases where ox-ploughs and tractors are used. With the formation of higher level farmer organisations, say to sub-county level, some of these implements could be accessed through an established financial arrangement.

Agricultural produce storage and processing facilities are still lacking for the LVB communities. Technologies extending the shelf life of perishable products and reducing post harvest losses such as solar drying, canning, juice extraction, packaging, and refrigeration are lacking. Some of the required technologies though available have to be popularized, given the fact that they have been prominent at trade fairs and agricultural shows.

Private public partnerships are few, and isolated for the variety of produce in the lake basin. The following interventions are proposed;

- Popularize and disseminate small scale agro-processing technologies through agricultural shows at district level and through extension services;
- Invest in institutional development of farmer organizations

- Support private public partnership opportunities in agro-processing, and in the establishment of agro-processing centres;
- Strengthen farmer organizations to access credit for agro-processing and mechanized agriculture equipment;
- Invest in tractor-hire services at every sub-county level;
- Construction of physical infrastructures for the livestock industry, including livestock markets, slaughter facilities and beef and milk processing centers.

Marketing Information Systems

Generally, the peasant farmers are not knowledgeable about new technologies, new cultivars and livestock breeds, drugs and other necessary inputs to improve their production. In addition, they don't have knowledge about where to sell their products, have poor quality agricultural produce, little opportunities to add value to produce, and are dissadvantaged in penetration of the regional and international markets. To overcome these constraints, the following investments are proposed;

- Facilitation of the Production and Marketing/Trade departments at District level to regularly provide media information on agriculture in the local languages, English and Swahili;
- Establishment of data bases on farm produce and markets at subcounty and District Headquarters;
- Conduct annual agricultural shows in each region, and at district level;
- Increased rural road investments (community roads) to link farmers with markets;
- Support establishment of pilot tele-centres in one sub-county per district to link farmers to markets and provide information on modern farming practices and technologies.

Promoting sustainable land use practices

Under LVEMP 1, the Land Use Management Component implemented by KARI scored highly in the pilot districts with increased use and adoption of improved land use management practices, and increased land productivity. To consolidate lessons learnt and experiences acquired for the benefit of LVEMPII, the following **interventions are proposed**:

- Up scaling improved land use technologies from the pilot sites basin wide, particularly soil erosion control measures;
- Dissemination of land use technologies information should be emphasised and demonstration sites developed for each district;
- Through existing structures, such as NAADS service providers, farmer institutions, and CBO's, undertake awareness campaigns to promote safe handling and use of agrochemicals;

- Strengthen linkages and partnerships among lead institutions including NAADS, NEMA, NARS, CBO's, NGO's, Farmer Associations and the Private Sector;
- Support local governments in the development and implementation of appropriate bye-laws for land use management;
- Promoting synergies with other stakeholders and projects in land use management including the TAMP project in the Kagera Basin Districts.

The primary focus of this sub-component this time should emphasise enhancing benefits of good land use practices, and stakeholders and existing players at local level will be crucial.

5.2 Fisheries

5.2.1 Improved Infrastructure at Landing Sites

Construction of supportive physical infrastructure at fish landing sites is vital to ensure quality, a pre-requisite for continued export and contribution to the livelihoods of many fishers and the economy as a whole. A highly developed quality assurance system is also crucial for both the local and foreign markets. The fish ban in the 1990's accounted for upto US$ 300 Million in lost foreign exchange earnings. There are government efforts to develop landing sites, with financing for 5 sites secured for lake Victoria, and others undertaken by the private sector, but these are too few for the large fishing community and the lake potential. This section proposes gazetting and development of upto 5 landing sites distributed across the districts of Rakai, Mukono, Jinja, Mayuge and Busia.

The following are intervention proposed:

- ❖ Suitable siting of landing sites based on scientifically and socially determined criteria, established in consultation with stakeholders and communities;
- ❖ Physical planning for the landing sites with the necessary infrastructure such as access roads, housing, water, electricity and sanitation facilities;
- ❖ Development of infrastructure at landing sites including landing jetties, washing and weighing slabs, fish collection/storage equipment, ice supply, to benefit the artisanal fishers in 10 landing sites;
- ❖ Construction of 3 ice plants to support the fish cold chain in the districts of Mukono, Rakai and Mayuge;
- ❖ Support formation of fishers organizations through which credit can be accessed for improved fish processing facilities such as fish smoking kilns, solar driers, as well as boats, fishing gear, and safety gear.

5.2.2 Ensuring sustainability of Fish Supplies

Given the trends in fish catch and decrease in species diversity presented in the lake, measures to ensure the sustainability of fish supplies have been proposed.

Sustainability of LVB resources rests on the stakeholders: EAC, National Governments and relevant Ministries and government agencies, scientists, commercial fish processors, artisan fishers and other local communities, who must secure good practices in the in the exploitation of the fish resources to sustain the LVB fishery.

The areas of emphasis in ensuring sustainability of fish supply discussed here are development of fisheries information systems, capacity building for BMUs' and Fisheries Departments in the districts, enforcement of regulations, supporting artisanal fishers, promoting aquaculture and fish caging to ensure increased supplies, and restocking.

Inventory and Regulation of Fishing Effort

There have been initiatives to put in place mechanisms to regulate and control fishing effort, but the information remains distortive and a clear picture on pressure on the lake fishery is yet to be determined. However, there are indications of decline of the resource, such as fish catch per unit effort. Despite the increased effort, supply to the commercial fish processors remains below capacity.

The BMUs established with the support of Fisheries Extension Officers (now at Subcounty level) provide an opportunity for undertaking such inventories, issuing permits, and enforcement of bye-laws, such as catch limitations or quotas. It has been noticed that data storage is poor at the district level hence these officers require to be equipped with computers and the necessary software. Besides, improved fishing methods should be promoted.

The following interventions are proposed:

- Strengthening monitoring and law enforcement services by BMUs and the shoreline districts' Fisheries Offices with motorised boats (1 per lake shore district) and radio communication systems as part of a wider MCS system for lake Victoria;
- Provision of computers to 10% of BMUs and 10 District Fisheries Offices for development of data bases on fish effort and fish catches on lake Victoria;
- Support dissemination of appropriate fishing technologies through radio, workshops and trade shows in each district;
- Provide credit to fishers to access improved fishing technologies;
- Support partnerships between fishers and private organisations e.g suppliers of fishing gear, boats, etc;
- Support quarterly districts and annual regional workshops for improvement and harmonization of the MCS system.

Strengthening BMUs and Fisherfolk Organizations

Well conceived strategies for fisher folk for fisher folk community development in order to facilitate their participation in environment management and fisheries conservation are critically important.

To date there are upto 1087 BMUs lakewide. The National Fisheries Policy and Fisheries Sector Strategic Plan emphasise decentralised participatory fisheries resources management, but this requires strengthened local governance, community based human resources and extension services.

Recommended Interventions to strengthen fish resource co-management and fishers institutions include:

- ❖ Provide training in leadership and management skills of BMUs and other stakeholders;
- ❖ Support the development of appropriate bye-laws by local Governments for beach management and their enforcement;
- ❖ Provide support for development and implementation of management plans by BMUs;
- ❖ Support creation of viable fishing communities or associations which can access fisheries financial credit scheme;
- ❖ Capacity building of NGO's and CBO's engaged in training, awareness campaigns and social services provision to BMUs.

Support to the Artisanal Fishery

The majority of communities around shores of LV depend on artisanal fishing. They use simple canoes, some of them fitted with outboard engines. They don't venture far into the lake. They occasionally capsize and die in rough lake storms. They don't wear life jackets. Generally, they lead precarious lives at the same time supply the public with all their fresh fish needs. Their incomes are low, have poor management skills of their resources. The men spend a lot of their earnings on drinks, and sex. Sometimes fish losses are as high as 20%.

The following actions for fisher folk or artisanal fishery are required in order to facilitate improved earnings.

- ❖ Support the formation of higher level BMUs and CBO's among the fishers in 50% of the lake shore districts at sub-county and district level through which support can be accessed or provided;
- ❖ Support development of infrastructure to limit post harvest losses, such as fish handling, storage, fish drying kilns, and washing slabs in atleast one gazetted landing site per district;

- ❖ Support efforts to disseminate appropriate fishing technologies from research institutes through workshops and mass media;

Fisheries Biodiversity Conservation

Species biodiversity loss on the lake threatens existence of some species such as *Barbus sp. and Hydrocynus sp*. These species have found refuge in wetlands, and in satellite lakes such as the Nabugabo, Kachera, Koki and the Kyoga satellite lakes. These lakes could be designated aquatic conservation areas, and fish breeding centres developed as well for future re-introduction of these species. **The interventions propoased under LVEMP II the following;**

- A fish breeding centre be developed at FIRI Jinja for the endangered species for eventual re-introduction into the depleted aquatic habitats;
- ❖ Sensitive ecosystems for fish breeding, one in each lake shore district, should be gazetted as "no fishing zones" and enforced by Beach Management Units (BMUs);
- ❖ Support local authorities at sub-county level in the development and enforcement of bye-laws against destructive gears and methods;
- ❖ Support the gazettement of atleast 2 satellite lakes with high fish diversity for designation as "marine parks";
- ❖ Support information sharing among experts on the status of lake fish species richness through annual workshops at regional level.

Promoting Aquaculture

Aquaculture provides real potential for increased fish supply for local nutritional purposes and export. For some of the visited districts during field activities, there is already commitment of PEAP/PMA funds and LGDP grants to establishment of demonstration ponds at parish level, and in some cases employment of fisheries officers to provide extension services at sub-county level. These efforts remain limited and at subsistence level.

There has been support from the IFMP project towards aquaculture. This has been limited to development of technical manuals and research. LVEMP II should concentrate on dissemination and adoption of aquaculture technologies, and utilization of existing fisheries extension staff and private service providers. In this connection, the **following areas are recommended for further support**:

- Development of 2 fish fry centers to serve the east and western part of the lake basin;
- Establish one model demonstration ponds in each district to improve the technical abilities of the farmers;
- Undertake capacity building of fisheries extension staff and private service providers in aquaculture development;

- Support dissemination of aquaculture technologies at the Kajjansi ARDC and FIRRI;
- Develop one fish collection center in each district, and establish market linkage for aquaculture products;
- Promote the culture of Ornamental fish for local and export markets.

Fish Caging

Fish caging is an area of opportunity that should be explored further. A case in point is Lake Kariba in Zimbabwe where it is undertaken. The required investments would then be fish cages and feed supply. Initial concerns would however be nitrification of the lake and delineation of local fishers from the resource. This needs to be further studied.

Reptile Farming

Cases of crocodile and snake rearing for export, ecotourism and game meat have been encountered in Mpigi, Wakiso and Mpigi Districts. This could be promoted for districts like Bugiri and Mayuge where they have been rampant. The limitation however is start up capital and maintenance costs. SME's in this sector should be provided with the required credit and extension services under LVEMP II.

5.3 Ecotourism Investments

The lake basin is blessed with opportunities for ecotourism, and some of the sites have been identified in earlier chapters. Institutions such as Uganda Wild Life Authority (UWA), Uganda Wildlife Education Centre (UWEC), Wetlands Inspection Division and the National Forestry Authority (NFA) already promote ecotourism activities, and in many cases are in partnership with the private sector in managing their sites.

The areas that need to be addressed include the required infrastructure including access roads, electricity coverage, telephone communication, water transport and safety, safe water supply and sanitation facilities, and development of accommodation/campsites and hotels. There is also a need to invest in marketing available ecotourism opportunities and capacity building in eco-tourism services. Local communities stand to benefit from ecotourism when organised in viable units such as BMUs, tour guides or resource user groups. These community groups can initiate labor based infrastructure imperovement including development of walkways or trails, and camping sites. With value addition to some of their craft products, better infrastructure and linkage to markets, they will fetch more money and improve their livelihood.

The following are the **priority areas of intervention/investments proposed** under the LVEMP II in the eco-tourism sector.

- Improved infrastructure including access roads, walkway trails, camp sites, and information centers for 5 eco-tourism sites in the districts of Mayuge, Mukono (Kome Island), Masaka and Mbarara;
- Support marketing of ecotourism activities through brochures, Internet and the mass media;
- Providing training for upto 10 public private partnerships in ecotourism services;
- Purchase 2 boats to link Kome Island (Mukono District) Ecotourism site to the mainland Towns of Jinja and Kampala;
- Establish Tourism information centers in 7 districts in the LVB managed by local community associations;
- Support community conservation efforts by UWA in the districts of Rakai and Mbarara.

5.4 Mining

The LVB is rich in mineral deposits, but exploration work has in the past lacked the necessary funding. As a result, most big mining companies have invested in Tanzania where investments were undertaken in geo-data acquisition and deposits located. The mineral potential in the lake basin has been discussed in chapter four. However, some US $ 42.7 million have been allocated to the Geological Department for mineral exploration, capacity and institutional building under a World Bank and Nordic support. But, this remains small given the requirements to revamp the minerals sector which has been neglected since the 1970's.

The most lucrative area for artisanal miners is building and construction materials - sand, gravel, clay for bricks and tiles, and stone. This is where the majority of the artisanal miners work, including women are involved. A few work in artisanal gold mines.

It is proposed that LVEMP II concentrates its interventions in the key mining districts of Mukono, Wakiso, Busia, Ntungamo, Mubende and Mbarara. **The identified areas requiring investments include:**

- Supporting formation of 20 artisan miners' groups through which support in terms of training and technology can be accessed or granted in the districts of Mukono, Wakiso, Busia, Ntungamo, Mubende and Mbarara;
- Dissemination of acquired geo-data to artisan miners, and supporting its use in mineral resource exploration and mining in the districts of Mukono, Wakiso, Busia, Ntungamo, Mubende and Mbarara;
- Support rehabilitation of 3 regional offices (in Mbarara, Kabale and Tororo), equipping laboratories with kits for mineral testing and training of staff in these regional office to provide extension services to artisan miners;
- Provide marketing information systems for mineral products in the districts of Mukono, Wakiso, Busia, Ntungamo, Mubende and Mbarara;

- Strengthening Public Institutional coordination, such as the Mining Inspection Division, NEMA and the Environmental Offices in Environmental Monitoring in the districts of Mukono, Wakiso, Busia, Ntungamo, Mubende and Mbarara;
  Provide 20 artisan groups with tools for small scale mining and mineral processing, such as crushers, excavators, drills and kilns

5.5 Water and Environment

Proposed investments in the Water and Environment are hereby presented per sector, and include Water Resources Management, Water Supply and Sanitation, Wetlands, Foestry, and in the control of th water hyacinth and invasive weeds.

5.5.1 Wetlands Interventions/investments

The Cost Benefit Analysis results of LVEMP1 reveal the potential for investment in the wetlands sector within the lake Victoria catchment. According to *HASKONING, et al 2001* the average total benefits of wetlands is about US$ 427 per hectare. This includes goods (crafts, construction materials) and services (waste water treatment, and other ecological functions), as well as non-typical values (agriculture, grazing, fishing). This makes a total of US$ 80m per year for the typical wetland goods and services estimated at US$267 per hectare per year for the 300,000 hectare coverage of wetlands in the LVB.

The successful pilot projects under LVEMP I need to be scaled up, and on-going interventions supported, particularly the WSSP. In order to further enhance the economic contributions of wetlands particularly as a strong base to contribute to poverty reduction, the **following community based interventions/investments are proposed under LVEMP II:**

- Preparation of Community Wetland Management Plans and their implementation to support communities in deriving improved livelihoods from this resource in two Ramsar sites, as well as McDonald Bay by 2012;
- Preparation of Community Wetland Management Plans and their implementation for Katonga System in the districts of Mpigi, Masaka, and Sembabule by 2012;
- Undertaking capacity building at district level for the disricts of Bugiri, Mayuge, Jinja, Mpigi, Masaka, Mubende and Sembabule;
- Supporting establishment of 20 Wetland Resource User CBO's and their capacity building to add value to wetland products and access markets in 10 LVB districts;
- Supporting propagation of rattan cane through establishment of nurseries and provision of planting materials.

5.5.2 Forestry Interventions/ Investments

LVEMP I efforts in catchment afforestation were measurably successful, and with more partners and institutions, the scaling up of these activities are likely to have greater impact. Some of the developments since the closure of CAPP are the establishment of NFA in charge of Central Forest Reserves, the District Forest Services with DFO's at districts employed by Local Governments and responsible for

Local Forest Reserves and extension services to local communities; and The SPGS focusing on private tree planters for plantation forests for timber.

Community needs such as fuel wood, charcoal and poles need to be catered for. Initiatives at district level are very much limited by lack of seedlings and extension services. It is proposed tree nurseries be established in every sub-county for community planting purposes supported by the LVEMP investment Fund. This could as well attract funding from carbon trading.

Other than tree planting, processing of tree products provide several opportunities for investment. Some of these include supporting artisanal carpentry with modern equipment, improved kilns for charcoal making, energy saving stoves, ecotourism in existing forest plantations – especially on the lake shores, and support to non-tree products investments such as apiculture.

Proposed interventions/Investments in the forestry sector that will be of benefit to the local communities include the following:

- Establishment of 100 community tree nurseries in 12 riparian districts including Wakiso, Mpigi, Mubende, Kalangala, Mukono, Busia, Busia, Iganga, Mayuge, Jinja, Mbarara and Ntungamo;
- Supporting and facilitating forestry extension services in 12 districts in the LVB including Wakiso, Mpigi, Mubende, Kalangala, Mukono, Busia, Busia, Iganga, Mayuge, Jinja, Mbarara and Ntungamo;
- Support formation of 50 community development groups in 10 districts and provide them with required initial start up capital such as establishment of nurseries, carpentry workshops, modern charcoal kilns, subsidised bee hives, and infrastructure for ecotourism etc;
- Promotion of agroforestry, particularly fruit trees and fodder production;
- Supporting information sharing and synergies with related projects and stakeholders through quarterly and annual workhops at district, national levels and regional levels;
- Promotion of pilot apiculture projects in the districts of 5 LVB districts.

5.5.3 Water Resources Management, supply and sanitation

The ares equiring investment in water resourses monitoring include construction and maintenance of hydrometric networks that will monitor hydraulic conditions, help in water quantification, monitoring of sedimentation and pollution discharges into the lake, and guide decision makers with appropriate lake basin management interventions. Local community involvement in water resources monitoring should as well be supported, and will include community sensitization and participation in data recording, and protection of the installed infrastructure, and capacity building at

district level in water resources monitoring and assessment, as well as enforcement of water regulations.

Investments to prevent water pollution from run-off from urban centres and industrial wastes are critical. In this regard planning of growth centres and landing sites has been emphasised and technical support for construction of latrines by the communities. Lake Victoria provides an opportunity for increased safe water coverage, especially in urban centers around the lake. The National Water and Sewerage Corporation mandated to provide water and sewerage services in large urban centers of Uganda on commercial basis only covers major towns, with the rural growth centres such as landing sites not covered. Other service providers catered for under the Water Act should be supported in water treatment and supply to these centres. Upto 10 motorised pumps and treatment plants (for water settlement and chlrorination) with a capacity of $10m^3$ are proposed. NGOs engaged in water and sanitation sector should as well be supported, particularly in their hygiene campaigns and in increased safe water coverage.

Specific to this component, the following **interventions are proposed** in water resources management, supply and sanitation;

- Improved monitoring and assessment of water resources
    - Procurement and establishement of 3 gauging stations in key catchments basinwide;
    - Procurement and maintainance of meteorological equipment stations;
    - Monographs and information management databases developed for the Katonga system;
    - Update and regular monitoring of water quality for Nakivubo and Kinawataka wetlands;
    - Capacity building at district level and of local communities to participate in water resources monitoring and assessments
- Improved rural safe water and sanitation coverage
    - 10 Motorised pumps and water treatment plants of $10m^3$ capacity installed at 10 gazetted landing sites in 7 districts (Busia, Bugiri, Mayuge, Mukono, Mpigi, Masaka and Rakai) and water kiosks constructed;
    - Sanitation and hygiene education and awareness by NGOs and CBO's supported in the lake shore districts.
- Reducing pollutant load from rural growth centers, municipalities and industries
    - 10 Physical plans for gazetted landing sites developed with provision for waste treatment facilities;
    - 50 Industries trained in cleaner production techniques and monitored by 2010

- Bulk water transfer to water stressed areas for small scale irrigation irrigation and livestock use
    - Improved water supply infrastructure for livestock, including dams, valley tanks;
    - 5 Small scale irrigation pilot schemes in Bugiri, Rakai, and Mbabara;

5.5.4 Control of Water hyacinth and other invasive weeds

Through concerted efforts of the Department of Fisheries and Research by NARO (FIRRI, NAARI) and funding from development partners, it was possible to reduce the spread of water hyacinth to manageable levels, from 30% to 10 % of area of Lake. However since completion of phase I of the LVEMP project, there has been resurgence of the weed rising to over 30% of the lake area.

The following are proposed interventions/Investments under LVEMP II to control the water hyacinth and other invasive weeds with local participation;

- Providing BMUs in each of the 10 shoreline districts with training, tools and protective gear for water hyacinth and other invasive weeds removal;
- Providing 4 boats to the fisheries offices for regional water hyacinth and invasive weeds monitoring;
- Purchase and install a GIS and acquire low cost RS data for the water hyacinth control unit for monitoring purposes;
- Rehabilitate and build capacity of BMUs to maintain 10 weevil rearing centers established under LVEMP I;
- Support opportunities for information exchange and synergies with other regional projects supporting community actions including NBI - NELSAP and FAO – TAMP that relate to water hyacinth control and prolifration.

5.6 Health support

Improved quality of life is a key area identified in the LVB SAP. Other than improved safe water and sanitation coverage, there is need to invest in control and prevention of major communicable, water-borne and vector-borne diseasews in the basin such as malaria, bilhazia, sleeping sickness and HIV/AID. The proposd activities include;

- Education and awareness programs and outreach on preventive health care;
- Strengthening awareness compaigns, sensitization, and capacity building on HIV/AIDS to communities;
- Increased access to drugs through improve extension services

5.7 Transport and communication

Transport and communication improvement will be crucial to the proposed investments in the LVB, particularly in linking local communities to markets and services, for promotion of various investments such as Ecotourism and mining. The transport sector particularly requires support given low funding available yet the road mileage and breadth has tremendously increased, together with the volume of traffic

and maintainance costs. The Ministry of Works and Transport is only able to maintain an estimated57% of the National Road Network. The investment areas proposed include;

- Support the districts to provide improved community road network linking producers to rural growth centres and urban markets;
- Supporting efforts to improve water transport, including development of landing sites, establishment of navigable roots and implementation of safety measures;
- Improvement of transport related infrastructure, such as cold storage facilities, ware houses, and godowns;
- Support efforts to harmonise the transport and communication policies in the EAC, as well as tariffs;
- Support private public partnerships in water transport;
- Support establishment of pilot tele-centres in 10 LVB districts.

5.8 Energy

Proposed investments in the energy sector include:

- Supporting increased rural electricity coverage in the LVB though extension of electricity to rural growth centres and landing sites;
- Promoting the use of alternative energy sources, such as solar energy, as well as energy saving stoves.

5.9 Environmental legal framework

Investment/intervention areas in the Environmental legal framework include the following:

- Capacity building of National Institutions, local governments and local groups for environmental monitoring and enforcement
- Strengthening local capacity: districts, civil society, CBO's, NGOs to support community driven natural resources management;
- Facilitation of development of bye-laws at local levels and their enforcement
- Regular review of natural resources management policies, strategies, Action Plans and legislation;
- Support capacity enhancement for EIA practitioners and post EIA monitoring, particularly at local levels;
- Support environmental education, public awareness campaigns and communication, particularly relating to sustainable use of the lake Victoria resources.

5.10 The investment Fund

In Chapter 6, the proposed Investment Fund is initially allocated a seed of of US $ 4.0 million. This is seen as money to benefit various community based projects and others initiated at District and National Levels aimed at conservation and sustainable development of the Lake Victoria Basin Resources. This is conceived to accommodate both loan and grant considerations taking account of circumstances involved.

However considering deficiencies in organization and project management skills, this report proposes support to the micro-finance sector and NGOs in capacity building including establishing community groups at parish, subcounty and District Levels. An allocation has been made for a study into how best to manage the fund, and utilization

of existing structures is emphasized. The details on the proposed investment fund establishment and operations is provided in chapter 6.

5.11 NGOs and CBOs support

The presence and coverage of CBOs and NGOs remains thin on the ground, yet they play a key role in Community Driven Development, including identification and implementation of projects, advocacy for the plight of local communities, and undertaking public awareness campaigns. Their capacity in terms of staffing, skills, knowledge, tools and facilitation needs to be enhanced.

5.12 Cross Cutting Issues

A number of cross cutting strategies have been considered under the LVEMP-strategies amongst which are improving institutions and governance, economics and incentives, social and behavioral change, Research and Technological responses, design of effectve decision making processes, demographical settlement priorities and HIV/AIDS.

5.12.1 Institutions and Governance

Changes in institutions and governance are required to create an enabling environment, effective management and sustainable use of the Lake Victoria ecosystem resources. At regional level, harmonization of policies, regulations and laws is vital, and under the auspices of LVBC and LVFO, there is opportunity for this. Besides, existing national and local institutions under the decentralization framework need to be strengthened. A coordinated, integrated and sector wide approach needs to be supported in managing the ecosystem resources given the diversity of stakeholders involved. The involvement of communities in resource management through formation of resource user groups is an important innovation but to attain maximum benefit, empowerment through capacity building is required. Greater stakeholder participation, including local communities, the private sector and the civil society gives an opportunity for a range of response of options, transparency of decision making, increased accountability, and elimination of corruption.

Uganda is a signatory to several multilateral, bilateral and other international environmental and economic agreements. Implementation of these agreements needs to be coordinated at national level and among relevant institutions and sectors. A case in point is the UNFCCC, UNCCD, CITES, CMS and CBD with similar goals addressing ecosystem related concerns.

5.12.2 Incentives and Disincentives

The unsustainable use of LVB resources by the basin communities and has increased degradation. The disincentives in place, including fines and legal fees seem not enough to avert mis use of te basin resources.. The financial interventions in place need to be strengthened so as to create the desired impact to protect the ecosystem.

It is important that policy issues affecting agricultural sector, fisheries, tourism, mining, water resources, forestry etc. should be regularly reviewed to address the existing gaps. Participatory approaches in natural resources management and in development planning process ensures beneficiary communities acquire strong ownership of the process and hence to guarantee the anticipated success.

Certain areas of concern regarding industrial development are tax holidays, tax wavers, and investment funds for activities that would add value to natural resources investments in the region. There is need to pay attention to infrastructure development, such as transport and communications, storage facilities and refrigeration for perishable products, and agro processing. Overall efforts geared towards improving livelihoods within the LVB and reducing pressure on the basin resources need to be supported.

5.12.3 Sustainability of Co-Management of Natural Resources

As the LVB region resources management grows, there is need to invest in the sustainability of co-management of the natural resources. Co-managed resources should include but not limited to: Fisheries, Waters, wetlands, Agricultural, Forestry, Mining, Tourism and recreational activities. Co-management calls for sharing of responsibilities, by the governments and local authorities, the artesian fishermen, farmers, miners and others. This can be achieved by cultivating a sense of ownership of the natural resources by the stakeholders, therefore the need for an investment incentive to all players. Several of co-management plans have been developed by the established collaborative management units such as the BMUs, LECs, Wetlands Committees and forestry.

5.12.4 Revenues from Lake Services

Revenues realized from the use of LVB resources have not benefited protection of resources as expected. In view of the current practices, there is need, through co-management of natural resources, to ensure that part of the revenues from the lake is allocated to support developmental programs set to benefit the communities and the governments. This will assist to realize improved conservation practices of the LVB-resources and greatly enhance economic development of the region. The communities living within and around the basin will be encouraged to realize the value of LVB resources to them. The proposed investment fund in chapter six would also benefit from the LVB resoyrbe based revenues.

5.12.5 Cleaner Production Incentives for Industry

Incentives in the context of LVB – region resources improvements, should be considered at the level of production. Cleaner, production incentives should include encouragement of participants in the production process to mordernise production process. In this regard new investments in terms of appropriate technology in the production processes i.e. use of modern fishing methods, acquiring modern agricultural tools and improved practices, influence efficiencies and productivity. This can be achieved through the government efforts to mobilize funding in support of the small, medium enterprises in collaboration with partners such as the Centre for Cleaner Production funded by UNIDO.

5.12.6 Microfinance

Though Microfinance is essentially to make rural credit accessible to the poor in the rural areas, it is noted that in LVB the use of this facility is still limited. Apart from traditional fear to borrow, lack of collaterals and the fact that farmers still act individually, the interest charged by credit operators are considered too high. There is therefore need to sensitize farmers and other community borrowers on how to take advantage of microfinance resources.

5.12.7 Social and Behavioral Responses

The LVB region is settled by people of different origins and cultures. The population is involved in different economic and social activities. It is therefore essential to encourage and support the activities of the civil society organizations who work to promote good neighborliness conduct practically regarding common use of the Lakes natural resources.

It is important that the diverse communities in the LVB are sensitized to appreciate their mutual interests in exploiting together the natural resources in the basin and in ensuring they are united in collaborative efforts in ensuring sustainable economic use of the basin resources. This perception of protecting the environment that assures their livelihoods today and tomorrow has to be internalized individually and collectively. This responsibility is of the civil society and local governments in the LVB.

5.12.8 Civil Society Involvement

Several international and local NGOs are involved in rendering diverse services in the Lake Victoria catchment districts. Most of these organizations are involved in rendering diverse services in public health handling cases of HIV / AIDS; Malaria cases and providing medical supplies. Others are involved in providing appropriate

skills in small business management, microfinance and general education and protection of environment through capacity building and capacity enhancement. The artisanal fishermen, agriculturalists, live stock farmers, business men, foresters and others have all benefited from these organizations, particularly acquiring planning and implementation techniques.

NGOs, CBOs and other Civil Society organizations will be useful partners in the implementation of LVB. It is therefore strongly recommended that the capacities are up-scaled, particularly their human resource base, information, monitoring and communication systems.

6.0 THE PROPOSED LAKE VICTORIA INVESTMENT FUND

6.1 Justification of the fund

The population of Lake Victoria Basin amounts to about a total of 30 million for the three riparian countries Kenya, Uganda and Tanzania. However, the greater catchment area of 192,000 km^2 covers parts of Rwanda and Burundi generating a gross economic product of some US $ 5.0 billion a year. As pointed out in different chapters but especially chapter one, two and three of this report the bulk of the population in the Lake's catchment are more than 80% rural and the vast majority are poor, highly dependent on natural resources exploitation and not equipped with modern tools to uplift themselves out of the poverty trap.

It is generally noted that the traditional practices including crop husbandly, animal husbandry, firewood gathering, fishing and the high population growth rates have over the years contributed to the degradation of the soils, deforestation and continuous destruction of the size of lakeshore wetlands and accentuating ecological degradation.

It is generally observed that the persistence and sometimes worsening ecological and environmental conditions in the Lake Basin have been extremely costly in terms of reduced production potentials in several sectors, reduced employment and exports and generally contributing to endemic poverty conditions in the basin.

The desire to establish an investment fund is in the circumstances, long overdue especially noting that in spite of the vast sustainable investment opportunities in the LVB, these have not yet attracted commensurate and sustainable exploitation by both local communities and international investors. The establishment of an investment fund uniquely to enhance development interventions of the LVB resources draws strong justification from the present ecological and environmental degradation costs in the basin. These costs are variously estimated at between 5% to 10% annually of the combined GDP of the partner states.

Siting an example from the wetlands sector, according to *HASKONING, et al 2001* to restore flora and fauna especially for urban wetlands to enhance their buffering capacity, improve ecological functions, allow for appropriate cultivation and extraction of goods, the incremental cost to achieve an IRR of 14% would be US$ 43/Ha/Year. This amounts to US$ 12.9m annually for the 300,000 Ha of wetlands in the LVB! The average value of wetland goods and services was estimated at US$ 267/Ha/Year, amounting to US$ 80 Milion per year for the LVB wetlands. An investment to this tune in the wetlands sector would require huge budgetary commitments or donor contributions.

The concern thus is sustainability of interventions and investments proposed to ensure the LVB is transformed into a vibrant economic development and growth zone. It is important to note that the current sourcing of development financing come from partner states, Multilateral and Bilateral donor support; commercial interveners; international NGOs and Banks (World Bank, ADB, EADB), among others. The question then is, why have the Investment Fund for LVB if these traditional and existing sourcing could expand their commitment levels to accommodate the requirements of LVB investments?

The simplest response to this valid concern is that the prospects of capitalizing anticipated ecological and environmental cost-savings that will come from best practices and improved management of LVB resource is uniquely attributed to the interventions in section 4 and 5. Secondly, these natural resources have hitherto been neglected, unsustainably exploited and current investment interventions are inadequate, isolated, not directly focusing on the lake Victoria Ecosystem, and far below the potential. The "principle of additionality" supports expended investment capacity that the fund would bring forth.

This study proposes an initial start up fund of US$ 4M.

6.2 Alternative fund concepts

In proposing the Lake Victoria Investment Fund, various fund concepts have been considered including statutory funds, Autonomous Funds, Ring-Fence Budgetary Allocations and Notional Funds. Table 6.1 provides a description of the nature of these funds and some existing examples.

For Natural Resources Interventions and Investments within the Lake Victoria Basin, this study highly recommends an Autonomous Fund, with a separate body – a Steering Committee to oversee the operations of the Fund, an account, and relative flexibility in its operations. This body could be appointed by the Minister of Water and Environment, and composed of members with sufficient experience, expertise and public standing from all intervention areas described in section 4 and 5, and with the LVEMP Secretariat Coordinator as Secretary. Guidelines will then be in place to guide the operations of the Fund. The organization and management structure for this Fund is described in section 6.7.

Table 6.1: Alternative Fund Concepts

Fund concept	Description	Examples
Statutory Funds	• Normally established by law. The relevant law normally defines their purpose and how funds must be applied. • Have specific sources of finance also determined by law that provides them with a degree of effective autonomy from day to day government budgetary control and interference. • Statutory funds may be separate legal entities with their own bank accounts, management and administration.Th ey may be authorised to borrow funds. • Statutory funds may also be under an obligation to provide financial credit	• The National Tree Fund established by the Forestry and Tree Planting Act, 2003 • The National Environment Fund established by the National Environment Act , CAP 153
Autonomous Funds	• May be established by law or by administrative decision in line with Government financial regulations. • The autonomy derives from establishing a body (board, council, steering committee, independent institution) separate from government to oversee the workings of the fund; • Autonomy is also often re-enforced by allowing the fund to have not only its own accounts, but to bank its funds independently of central government (while subject to government financial regulations) thus ensuring their availability to meet any obligations entered into by the fund.	• The Saw Log Production Grant Scheme
Ring-Fenced budgetary allaocations	• Established within the framework of routine government budgeting and expenditure for specific purposes, with the control of the fund in the hands of line ministries or government agencies; • Monies unspent at end of fiscal year are returned/lost	• Conditional Grants
Notional Fund	• Expenditure which satisfies a declared purpose is attributed to the Fund; • Could take the form of subsidies to particular sectors or activities.	

6.3 Potential Support Forms from the Investment Fund

6.3.1 Subsidies

This can be made available to organized local community groups engaged in conservation activities. This could include establishment of nurseries for community tree planting, low cost rattan cane seedlings, and papyrus cuttings for wetland restoration. The subsidies could also be used for establishment of pilot sites for improved land use practices, purchase and distribution of low cost seeds and technologies for crops and livestock, fish fry for demonstration fish ponds, provision of appropriate fishing gear and safety gear for artisanal fishermen at low cost.

6.3.2 Subsidised Technical services

One of the deficient areas identified during field visits and consultations with stake holders was limited capacity and budgets to offer extension services in all natural resources sectors basin wide. An arrangement similar to that of NAADS is proposed where the beneficiaries will share costs of extension services, particularly as organised groups. Some of the areas to fund include extension services mobilization, training of CBO's, facilitation of formation of higher level farmer groups, resource user groups in the wetlands, fisheries, forestry and mining sectors, and capacity building for extension service providers.

6.3.3 Grant Schemes

Grant Schemes with usefull learning experiences are Sawlong Production Grant Scheme funded by the EU, and EMCAPP. SPGS provides grants for plantation

establishment to the tune of US$ 330 per Per hectare, payable in three installments in three years. It also offers extension support. The key administrative arrangements include the Sawlog Production Grants Committee chaired by the PS (MWE), with representation from Finance, EU Delegation, FID, NFA, Private Sector, an NGO, as well as legal and socio-economic sector representatives. Guidelines are in place for accessing grants, the committee receives and reviews all applications, and monitors implementation and authorized payments. Key to the successes registered is commitment of the beneficiaries, for example site acquisition, preparation and half the plantation establishment costs.

Another case is that of the NEMA implemented Environment Management and Capacity Building Projects implemented in 31 districts in the country. This had a District Coordination Unit to select projects for funding. The District Councils and the projects entered agreements with NEMA for implementation, with money sent to Districts Councils to pass on to the beneficiary projects. District structures have been used to ensure monitoring and accountability.

It is proposed that the LVB Investment Fund takes advantage of such existing structures, as well as consider these institutions as likely partners in implementation of the proposed Fund. The proposed Fund could as well be a beneficiary of these existing Grants in the long term.

6.3.4 Loans

One of the findings of this study is the inability of existing micro-finance institutions to provide loans and the required extension services for Community Driven Development at affordable rates, and to investments in natural resources in particular. There are however success cases of "revolving funds" especially in the agricultural sector benefiting local communities which can be scaled up. In Busia district, it was reported farmers groups obtain upto Uganda Shillings 800,000 for seeds and agricultural inputs through the ISFG grants, which is payed vback after harvests, and used to benefit other groups. The amounts geiven are rather low to transform the subsistance farming to commercial farming.

However for SME's and other large scale investments, partner micro-finance institutions or commercial banks should be identified for collaboration by the proposed Steering Committee to offer short term and long term loans to natural resource based investments. The project proposals will be scrutinized to meet quality criteria at district and national levels, with the most competitive receiving the loans.

6.3.5 Proposed Forms of Support

We propose the use and scaling up of revolving fund approaches, and the grant schemes. The existing structures at local levels, including local community organizations should be strengthened to ensure they benefit from these grants. Besides local governance structures already in place can be utilized to screen projects at various levels for funding. Subsidies are discouraged because of the difficulty in sustaining them, as has been the experience with some LVEMP I community projects.

6.4 Criteria for projects access to fund

This report provides the status of CDD in section 4, on-going actions and opportunities to ensure sustainable development in the LVB. The investment Fund should in the short term target Community Projects that ensure a balance between

environment conservation and development. More specifically, projects proposed meeting the following criteria will be of priority:

i. Addressing priority environmental and local development problems identified by local communities in the thematic areas of agriculture, fisheries, forestry, water resources, wetland resources, ecotourism, mining, safe water and sanitation coverage, energy, community roads, Transport related infrastructure, marketing and information systems,
ii. Community ownership of projects, including contributions to project;
iii. Socio-economic benefits arising from project implemention, such as improved household incomes and poverty alleviation;
iv. Possibility of scaling-up or replication of projects;
v. Promotion of synergies and involvement of CBO, NGOs, Private Sector, and Local Governments, plus linkages with other projects;
vi. Project contribution to global goals such as MDG's, PEAP, and Sectoral Strategies.

6.5 Sources of Funds for the LVB Investment Fund

Besides the partner states Kenya, Uganda and Tanzania with the respective communities in the LVB and catchment, other stakeholders include donors (interested in sustainable socio-economic development activities), international NGOs and local NGOs and CBOs (interested in uplifting the welfare of poor people); international organizations concerned with conservation of the lake Victoria ecosystem; and of course the East Africa community and its agencies interested in the overall sustainable socio-economic development of the LVB and its catchment. These authorities and organs will in different ways be interested to contribute to the fund directly or indirectly given the unique LVB development potential and the ecosystem global significance.

6.5.1 Local sources

As mentioned in section 6.2 this fund will not automatically benefit from the Ministry of Water and Environment budget. But in principle measures could be introduced by the government to ensure the LVB Investment Fund has a reliable and independent source of revenues. For the natural resource endowments, levies could be introduced such as for fish, forestry products, minerals, bulk water abstraction, water use for energy generation, water use for transport and also tourism activities. Kenya and Tanzania already have fish levies of upto 6 and 4 % on lake Victoria.

There are legal instruments in place that if enforced could generate funds, a share of which could go into funding the LVB Investments. This include permits such as the wetlands use permits, the waste water discharge permits, and the water abstraction permits. Local Governments have in place bye-laws and ordinances in place that if implemented could co-finance the fund. The LVB fund could benefit from other legally established funds such as the National Environment Fund, the National Tree Fund, and the Wildlife Fund.

Another way proposed to kick start the Fund is from Government allocations. This could be from budgetary allocations such as MWE, MAAIF, MLoG, and MTTI; the other would consideratoion as a legitimate beneficiairy of the Poverty Action Fund (PAF). The Wetlands Sector Strategic Plan Support Project already benefits from the PAF fund, implying other natural resource sectors that have potential to eradicate poverty could be eligible.

6.5.2 Carbon trading

The sixth annual World Bank carbon market intelligence study, released at CARBON EXPO, 2006, shows a dramatic growth in the global carbon market, led by strong activity in the European Union's pilot Emissions Trading Scheme (EU ETS). The report which covers the period from January 1, 2005 to March 31, 2006 records a booming global market worth over US $10 billion in 2005, ten times the value of the previous year.

The 2006 Report shows explosive growth in allowance markets, making them for the second year the main driver of growth of the market. European Union trades dominated the carbon market in terms of value-75 percent in 2005, but almost half of the total volume of greenhouse gas (GHG) emission reductions came from the developing world, making developing countries meaningful participants in the drive to reduce climate altering greenhouse gases on the earth.

According to the report "price signals in the carbon market have stimulated innovation especially in developing countries." The market analysis shows that transactions from projects in developing countries and economies in transition totalled 364 million tons of greenhouse gas emission reductions and in the EU ETS, some 322 million tons of allowances were transacted.

Through the Clean Development Mechanism of Kyoto Protocol, industrialized country companies and governments can meet their green house gas emission reductions commitments by paying monetary incentives to investments such as tree growing and renewable energy technologies. In Uganda, Tetra Pak is the biggest buyer purchasing 9,000tonnes of carbon at £4 per tonne every year from 153 farmers for about 100 hectares of indigenous trees. NEMA has obtained funding for 10 Municipalities to undertake waste composting that will also reduce green house emissions. Such opportunities should further be explored.

6.5.3 NGO’s and the Private Sector

The NGO’s and private sectors will be treated as partners in this venture. These are known to attract funds of their own and could co-finance various activities of the LVB fund, or act as a basket to channel the funds to priority intervention areas.

The private sector has demonstrated potential in various sectors, such as tree planting, water supply and sanitation, infrastructure development, and various public – private partnerships. Some of these cases have been listed in chapter 4. These openings should be looked into, particularly in seeking strategic partnerships in the private sector.

6.5.4 Donor Finance

Restoration, sustainable use and development of the lake Victoria Ecosystem and prosperity of livelihoods through well articulated investments are expected to be popular with donors. The challenge is to ensure success, and some cases of successful similar fund administration such as the SPGS, and the NEMA capacity Building Project are relevant lessons that be drawn. Another case is of micro-projects implemented under LVEMP 1, some of which have been successful and have lived beyond the project.

One of the ways LVB investment Fund would attract funding would be by organizing a donor conference. One of such successful cases is the NBI water facility, ADB water facility that have attracted funds through such conferences.

6.6 Fund Establishment and organisation

It is envisaged that at the initial period of five years (2007 – 2012) of LVEMP II implementation, the business of the investment fund should be managed as a "Unique Service" under the institutional setting of the Lake Victoria Basin Commission. This would enable the fund to acquire the requisite experiences and skills in planning; policy interpretation; resource mobilization; handling small scale projects but especially building up business confidence and useful network.

It is proposed that an autonomous Steering Committee consisting of about ten members appointed by the Minister of Water and Environment, with coverage in expertise of all investment areas identified in section 5, including agriculture and livestock, fisheries, water resources, wetlands, mining, tourism, energy, transport and communication. The Secretary to this Committee should be a Civil Servant, preferably the National Focal Point of LVEMP. It is also proposed that the LVEMP National Secretariat provides administrative support to the Steering Committee. The National Secretariate will then be expanded to include an Investment Fund Administrator.

For management of the various access windows of this fund, three levels have been suggested including the Communal levels, District Levels, and National Levels, all of which require various standards of access.

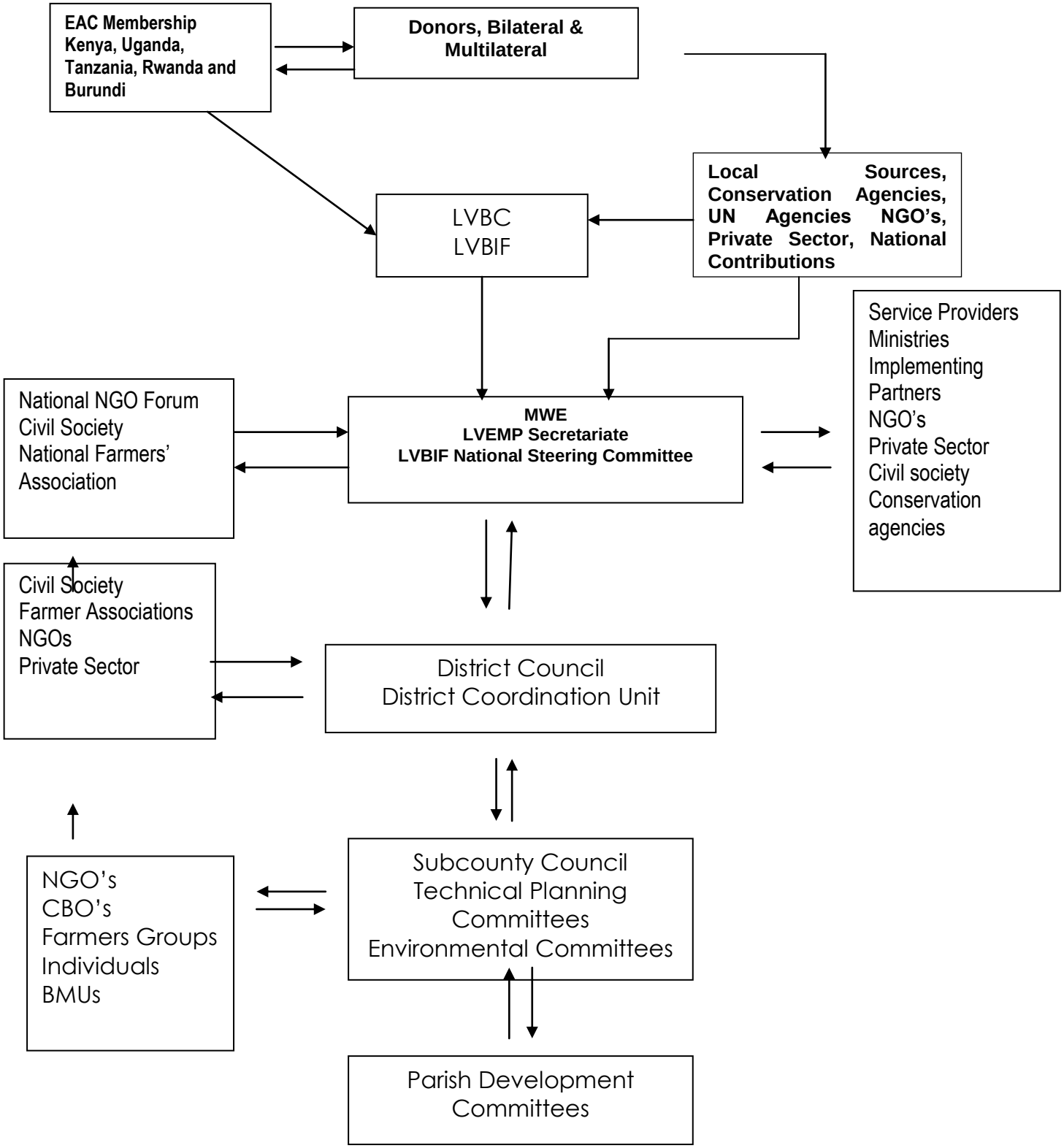
For community based projects and those initiated by individuals, and the district, the experience of NEMA has had with the Environment Management and Capacity Building project are vital, as well as NAADS in extension service provision. The projects to be funded should be community driven hence structures at parish and subcounty level (Development and planning committees) will be critical for screening under given criteria. A District Coordination Unit has been proposed to screen and select projects to benefit from the fund at the district level. These projects can originate from subcouties, NGO's, Organised groups and the private sector subject to

approval by the Steering Committee at National level. The Steering committee will then enter agreement with the District Council and the project for fund provision and its implementation. The Steering Committee will then pass money to the District Council, which will in turn pass it to the benefiting project.

Existing local structures such as the Parish Development Committees, the Local Environment Committees (active at subcounty level), Beach Management Units, Farmers Associations and various CBO's can as well be utilized to identify community driven projects for funding, as well as in the implementation and monitoring of the projects. An NGO forum at District is proposed for easy coordination of activities and their involvement with LVEMP projects. The NGO projects will be selected at District level, and also at national level where their activities have a Basin wide appeal.

Other stakeholders and partners identified include Government Ministries and Lead Agencies such as NEMA, NFA, FID, NARS, UWA, UWEC, PSF, UMA, UIA, WID, NAADS Secretariat, Uganda National Farmers Association, all of which operate at national level. Projects to be implemented by these institutions will be handled at the national level (Steering Committee). These are also seen as strategic partners for LVEMP. Figure 6.1 shows the proposed organization of the investment fund.

Figure 6.1 Proposed Investment Fund Organisations



6.7 Fund management cost implications

The estimated initial costs for inaugurating the Fund will include recruitment, advertising, and induction workshops for stakeholders, legal fees, fees payable to various consultancy services, consumables, purchase of vehicle for the fund administrator, and salaries for the administrator and support staff. Preparatory activitoies will include preparation of structures for fund disbursement, and capacity building of community groups to beneit from the funds. It is proposed that Micro-finace institutions and NGOs undrtake the preparatory work coordinated by the secretariate.

The expenses for administration of funds disbursed will be upto 10%. This study proposes the option of a Sole Contractor to manage the fund in future as it grows, which could be an NGO, selected based on competitiveness of their proposals to manage the fund.

7.0 IMPLEMENTATION MECHANISM FOR LVEMPII: (NR INTERVENTIONS AND INVESTMENT PROJECTS)

LVEMP I implementation offers great learning opportunities for LVEMP II. Establishment of LVEMP I followed consultation of stakeholders in the three countries on issues related to the management of Lake Victoria and its catchment, thus ensuring common ownership of the program. This section looks into the existing institutional framework, at regional, national and local levels, and advances the case of community, civil society and private sector involvement in implementation of LVEMP 11 natural resources investments/interventions. Utilisation of existing structures for project implementation is also recommended.

7.1 Regional Agencies

The regional agencies include the EAC, LVFO, and the LVBC. Under LVEMP 1, linkage to the EAC was through the RPSC. Recent changes include the incorporation of LVFO as an EAC body, and the establishment of the LVBC – an equivalent of the RPSC. The emergence of the LVBC within the EAC is seen as an opportunity to spur sustainable development in the region, including agriculture, fisheries, forestry, mining, energy, transport and communications.

The institutional structure of the LVBC includes the Sectoral Council, the Coordination Committee, Sectoral Committees and the Commission Secretariat, each with roles. Each partner states will then have a National Focal Point responsible for coordinating National initiatives of LVB and share information with the Commission. The challenge here is to eliminate bureaucracies that would slow down project implementation, and information flow between the LVBC, the National Focal Point and Implementing agencies. As mentioned above, LVEMP11 will have a National Focal Point, but the sectoral committees based in Kisumu will coordinate their activities. There is also the Coordination Committee dealing with reports from sectoral committees and reporting to the Sectoral Council, and the Sectoral Council dealing with Policy. At the National Level, there is the proposed Project Implementation Committee and the National Technical Committee whose roles and composition if well defined, could ensure project implementation efficacy.

At regional level, synergies with existing transboundary projects including NBI, NELSAP, and FAO – TAMP should be promoted, and opportunities for information sharing enhanced.

7.2 National level

At National Level, the Focal Ministry will be that responsible for Water Resources – the Ministry of Water and Environment. Already in place is the National Policy Steering Committee comprising of Permanent Secretaries of . LVEMP II will have has a National Secretariat as the nodal point for programme activities. This

Secretariat, headed by a National Project Coordinator, should be expanded to have more technical staff given its scope of work to ensure project efficacy. One of the new areas is administration of the proposed Investment Fund for which an Administrator wil be required. There will as well be need for a Monitoring and Evaluation Specialist to ensure the various components keep on track with the LVEMP II objectives and deliver required outcomes. The other is a Communication Specialist.

The Implementing Agencies

Other than the ten implementing agencies under LVEMP I, this study identifies various stakeholders for implementation of LVEMP II. The need for harmonization of efforts and synergies is also emphasized. Local Governments have since emerged as drivers of community driven development and will be useful partners. Besides, local community institutions and natural resource user groups such as BMUs should ensure the local communities benefit from the promise of LVEMP II. Many of the activities appear to have been centralized, and the decentralized context now will demand broadening participation of Local Governments, the Private Sector, Civil Society and local communities. The emphasis will be capacity building of these institutions and ensuring accountabilities and information flow.

Given the multitude of areas identified for natural resources investments/ interventions, the number of implementing agencies will be higher, and issues of procurement and accountability, monitoring, evaluation, reporting structures and learning systems need to be addressed. The requirement for Resource persons at the secretariat should as well be addressed. How the national agencies relate with other implementing partners, or implementing agencies, particularly at the District levels, the private sector, civil society and local communities will have a bearing on project success. The Issue of capacities of implementing partners needs to be addressed and competitive bidding in implementation of community driven projects promoted. Presence of project coordinators/leaders for all implementing agencies/partners, well worked program targets and performance yardsticks, and information flow and accountability is strongly advocated.

7.3 Local Governments and Public Participation

In accordance with the Local Government Act, 2000 the central government continues to devolve power and management responsibility to districts and lower local governments. To date, all the riparian districts have elected governments, and undertake participatory development planning to parish level. The local Governments run a number of community driven projects, and the focus has been improved social service delivery such as education, health, water and sanitation, and roads development. Capacity continues to be developed in these local governments to manage this development process. Of interest is the management of LGDP grants by these local Governments.

From district to parish levels, community driven natural resource management is being promoted through development of action plans for management of wetlands, and the environment, establishement of wetland management committees, and Local Environment Committees, co-management through establishment of Beach Management Units, and MoUs for management of wetlands, wildlife protected areas (National Parks) and forest reserves. Existing local structures and Community involvement in natural resources interventions is thus an area of opportunity for LVEMP II and existing initiatives need to be strengthened or upscaled.

However, the local governments remain entirely dependent on central government funding, and are only able to fund a minor part of their DDPs. The areas of natural resources interventions and investments thus receive less priority. Some of the identified interventions/investments are mentioned in the DDPs hence an opportunity for LVEMP III to add value to the district development initiatives. A mechanism should be put in place that ensures funding to investments in the districts and lower local governments can be accounted for, and the project implementation monitored using existing local structures. Community participation should also be encouraged, and these communities empowered to benefit from the promise of LVEMP II interventions.

The NGO and CBO's presence in the districts visited, and documentation of their activities was available at the District Community Development offices. However, though numerous, a few of them seem to have impact on the ground and presence in remote areas such as landing sites on the islands of Lake Victoria. In some cases, they have established fora for specific disciplines such as "Environmental NGO fora". At the District level, the activities of these NGO's are now monitored and regulated. With the Districts as implementing agencies for natural resources investment/intervention projects, the NGOs and the private sector can turn out to be viable partners.

7.4 Information Flow

Information flow will be crucial in the management of the proposed natural resources interventions/investment projects under LVEMP 11. The domains include;

- Within the LVEMP institutional hierarchy;
- Internal flow within the National Focal Point/Secretariat;
- Between the secretariat and implementing agencies or project components;
- Between implementing partners/project components;
- Between the secretariat and other stake holders;
- Between the implementing agencies and their implementing partners;
- Between the implementing agencies/partners and the benefiting communities;
- Between communities, such as BMUs.

LVEMP II implementation indicates some of these segments seem to have been ignored or weak, especially between the Regional and National level, between project components, and with other key stakeholders (see table 7.1 below). A strategy needs to be worked out to ease information flow at all levels and in all domains. For

example, some implementing agencies such as the NARO Research Institutes with outreach components could be utilized to reach local communities through their partners at district level – the private extension service providers.

Table 7.1: List of stakeholders per sector for proposed Natural Resources interventions/investments

Sector	Stakeholders
Agriculture	• MAAIF • NARS (KARI, NARI, ARCs) • NAADS • UNFA • Extension Service Providers • UMA, Agro-processors • UNIDO/UCPC • Farmer Groups • District Local Governments
Fisheries	• MAAIF • NARS (FIRRI, ARDC') • NAADS • Extension service providers • NGOs • BMUs • District Local Governments
Wetlands	• MWE • WID • NGOs • Community Groups • District Local Governments
Water Resources	• MWE • MAAIF • DWD • NWSC • NGOs, CBOs • District Local Governments
Water Hyacinth Control	• MAAIF • NARS (FIRRI) • WATER Hyacinth Control Unit • BMUs, NGOs • District Local Governments • Private Sector
Ecotourism	• MTTI • UWA • Private Sector • Local Ecotourism groups, CBOs • NGOs
Mining	• MEMD • District Local Government • CBOs, NGOs • Private Sector
Transport and Communication	• MWTC • District Local Governments
Energy	• MEMD • ERT • NGOs, CBOs

8.0 PROPOSED BUDGET ESTIMATE, NATURAL RESOURCES INTERVENTION/ INVESTMENT COMPONENT

8.1 Introduction

According to the World Bank IDA[3] indicative estimates the total project cost for the LVEMP second phase 2007-2013 are anticipated to amount to some US$165 million. This will cover not only the riparian countries Kenya, Uganda, Tanzania and Uganda but also Rwanda and Burundi.

The sources of financing for the LVEMP2 are summarized below in Table 8.1.

Table 8.1: Sources of financing for LVEMP II

Source	Million US$
IDA credit	90.00
Bilateral donors	30.00
Counterpart funds	15.00
Residual GEF	30.00
Total	165.00

The LVEMP2 intervention encompasses four components including

- Building information base for governance and growth;
- Strengthening governance of transboundary natural resources;
- Enhancing sustainable economic growth
- Raising public awareness through education and communication.

Precise costs of each of these components are still in the process of evaluation (TDA/SAP).

8.2 Natural Resource Interventions/Investment: Proposed Budget Estimates.

In the background of US$165 million estimated for LVEMP2 2007-2013 i.e for a period of 6years and considering that 5 countries are covered viz: Kenya, Uganda, Tanzania, Rwanda and Burundi, it is then clear that the resources allocation for each country is considerably moderate against individual resource needs. According to national guidance received from LVEMP secretariat, Uganda, the financial assistance/Intervention for the natural resource intervention/ investments is not expected to exceed US$15 million inclusive of US$4 million to be allocated as a start up capital for the investment fund.

The resource allocated for the investment fund i.e. $4million is earmarked to finance the following interventions:

[3] LVEMP phase 2 project preparation mission- Burundi, Kenya, Rwanda, Uganda and Tanzania September 18 – October 06, 2006

- Undertaking feasibility studies i.e community based best practices in wetland use, forestry protection, water management and related areas enhancing protection of the ecosystem.
- Facilitate disadvantaged groups participate in the micro enterprises that promote and enhance environmentally and socially sustainable economic development and make visible contributions to poverty reduction,

Detailed indicative Budget estimates have been established based on the ToR and the log frame. Table 8.2 below shows Sectoral allocations as highlighted in the chapters five, on investment priorities and chapter nine on recommendations.

It is noted that the proposed budget allocation below underscores the controbituioion anticipated from Agriculture, microfinance industry and fisheries, water resources and transport in mordernising the economy**.**

Table 8.2: Proposed LVEMPII SECTORAL BUDGET[4] (U shs)

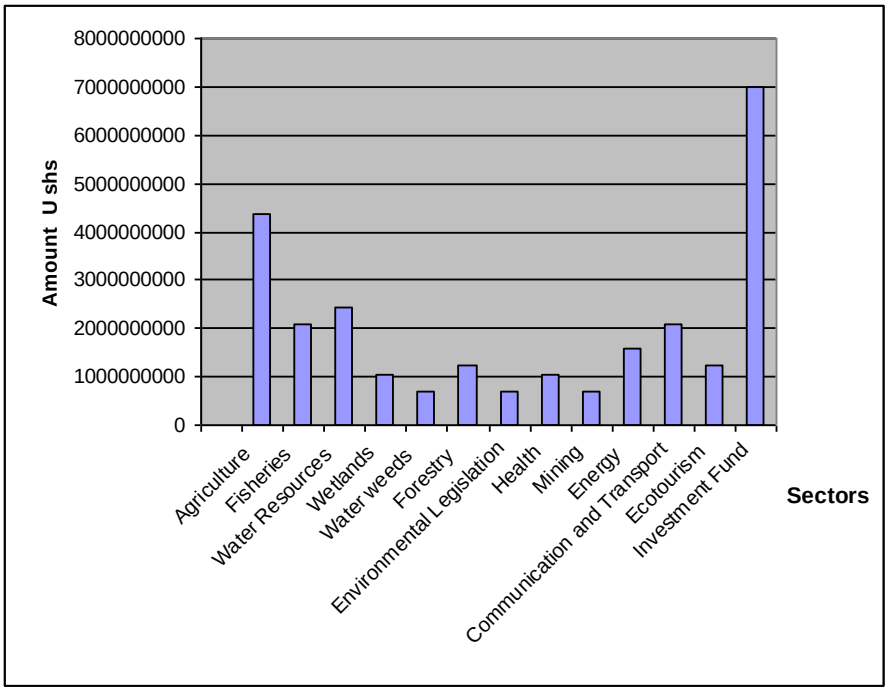
Sectors	**Annual budget UGX**						**Total UGX**	**% Share**
	2007/08	**2008/09**	**2009/10**	**2010/111**	**2011/12**	**2012/13**		
Agriculture	477,693,750	839,781,250	916,125,000	983,743,750	628,200,000	516,956,250	4,362,500,000	**16.7**
Fisheries	277,455,000	617,730,000	577,595,000	287,925,000	176,245,000	157,050,000	2,094,000,000	**8.00**
Water Resources	230,340,000	752,095,000	528,735,000	322,825,000	223,360,000	167,520,000	2,443,000,000	**9.33**
Wetlands	75,035,000	191,950,000	240,810,000	248,662,500	179,735,000	110,807,500	1,047,000,000	**4.00**
Water weeds	82,015,000	193,695,000	136,110,000	139,600,000	83,760,000	62,820,000	698,000,000	**2.67**
Forestry	166,211,250	219,433,750	246,045,000	229,031,250	219,870,000	140,908,750	1,221,500,000	**4.67**
Environmental Legislation	88,995,000	109,935,000	123,895,000	136,110,000	115,170,000	123,895,000	698,000,000	**2.67**
Health	174,500,000	174,500,000	191,950,000	191,950,000	174,500,000	174,500,000	1,047,000,000	**4.00**
Mining	83,760,000	123,895,000	127,385,000	130,875,000	127,385,000	104,700,000	698,000,000	**2.67**
Energy	235,575,000	270,475,000	305,375,000	305,375,000	253,025,000	200,675,000	1,570,500,000	**6.00**
Communication and Transport	366,450,000	349,000,000	366,450,000	331,550,000	349,000,000	331,550,000	2,094,000,000	**8.00**
Ecotourism	96,411,250	367,758,750	202,420,000	211,581,250	193,695,000	149,633,750	1,221,500,000	**4.67**
Investment Fund	942,300,000	1,308,750,000	1,587,950,000	1,169,150,000	1,169,150,000	802,700,000	6,980,000,000	**26.7**
Grand Total	**3,296,741,250**	**5,518,998,750**	**5,550,845,000**	**4,688,378,750**	**3,893,095,000**	**3,043,716,250**	**26,175,000,000**	**100**

Source annex2

[4] This budget estimate is inclusive of US$ 4 million which is allocated to initiate the investment fund as explained in chapter 6 of this report.

The level of proposed LVEMP 2 Budget allocation in chart 8.1 below for communication and transport reflects the critical role of linking agricultural produce to urban markets while the allocation to health sector to fight HIV/AIDS, Maleria and other communicable diseases has direct bearing on the increase of productivity in rural communities. This situation is greatly enhanced by supply of safe water.

Chart 8.1: Relative sectoral shares



8.3 Budget notes

The figures in the above table are indicative estimates and the allocation is based on the following assumptions and consideration

- The various aspects of Community driven development emerge in different activities in all sectors.
- The Budget emphasizes the sectors that contribute to improving livelihoods of riparian communities. The importance of sectors such as Agriculture, Water Resources, Health, Transport and Rural energy among others is highlighted.
- Technical Assistance has been allocated an average of 5% of each Sectoral Budget. This is to cover the costs for all the necessary Consultancies, Research.
- Administrative expenses take 10% of the Sectoral budget. This is to cater Staff Allowances, Transport costs and other contingency costs.
- In making these estimates for various Sectoral allocations experiences of institutions e.g. NAADS, PMA etc have been considered.
- Timeframe: six (6) Year Plan: 2007/8 to 2011/13

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9.0 STUDY RECOMMENDATION

9.1 Introduction

This study has revealed a number of opportunities for natural resources investment and interventions, particularly in the fisheries, agricultural, mining, tourism, forestry, water resources sectors. It puts across the case for an investment fund for sustainable socio-economic development in the Lake Victoria Basin, and suggests an implementation mechanism for these interventions/investments.

LVEMP 1 has enable collection of a critical mass of data and capacity building that can be utilized for sustainable management of the Lake Ecosystem and socio-economic development under LEVMEP II. For the success of the proposed interventions and investments under LVEMP II the following has to be undertaken.

9.2 Rapid assessment of needs

Rapid assessment of needs is required prior to implementation of these Interventions. Under LVEMP 1, needs assessment prior to capacity building, and micro-projects was not adequately comprehensive and the geographical coverage limited. Similar interventions have been proposed, such as improvement of landing sites infrastructure, support to fishers, support to agriculture, capacity building of resource co-management, but for their sustainability, understanding the context within which these projects will be implemented and community needs served is impotant. Existing structures at local levels such as the local governments, BMU's, Civil Society and NGO's could be utilized for this purpose. The identified intervention/investment areas in the attached logframe will be a useful guide in this process.

9.3 Capacity assessment of implementing agencies, partners

The focus of LVEMP1 was limited to data generation, capacity building and research for most of the implementing partners. The challenge now is for the ecosystem to benefit from such data in terms of its management and development. Lessons to learn from previous activities include weaknesses of implementing partners and agencies in terms of human capacity and in communication that affected project implementation. In some cases implementing agencies could not account for funds in time, not communicate project implementation status thus derailing disbursement of funds both from the secretariate and the donors. The absorption capacities of some of these agencies are an important issue.

LVEMP II will be a larger undertaking, in scope and extent, and with more stakeholders. This study suggests involvement of new stakeholders at different levels,

including District Local Governments, Private Sector, Civil Society, NGOs and various Central agencies. Standards should be set in terms of human resources, accountabilities, communication to ease implementation. Besides, the implementation has to recognize the highly decentralized context of resource use and management. Competitive bidding has been recommended for community driven projects.

9.4 Scaling up technology dissemination, interventions basin wide

There are pilot initiatives under LVEMP 1 that should be scaled up basin wide, including soil conservation, weevil rearing and overall water hyacinth control. Recent initiatives have been under NAADS and local governments promoting improved seeds and crop varieties, improved animal breeds, pasture, fish farming and fishing methods. There has been on-going research by NARO Research Institutes and Agricultural Development Centres that have good geographical coverage of the lake basin. Scaling up of dissemination of these technologies is expected to reduce pressure on the lake ecosystem.

Support to research efforts and strengthening linkages between research institutions, extension services and the benefiting communities needs to be emphasised. Capacity building of extension services providers also needs to be addressed as some sectors have been shown to lack the necessary expertise, such as fish farming and non-traditional crops. The need to support the private sector or public private partnerships that are involved in the supply of inputs, improved technologies and extensions services is important.

9.5 Value addition to products

Most agricultural, fisheries, forest, and mining outputs require value addition to compete on the local, regional and international markets. For agriculture, it needs to be emphasised that support should be provided for post harvest facilities, such as drying, storage and processing technologies. For food security in the region, maize, cassava, potatoes, bananas, beans should particularly be addressed. For highly perishable products such as fruits, vegetables, meat, milk, flowers and fish, cold storage facilities and appropriate transportation should be promoted.

Value addition provides opportunities for private public partnerships and established resource user groups such as farmers' associations, some of which have been identified in section 5. The investment fund and the microfinance industry ought to support these.

9.6 Interventions on Industrial Development

There has been a focus on the establishment of industries the manufacture products for local consumption and less on export oriented products. Fiscal and monetary policies are important but are not sufficient incentive frameworks to induce investors in the Lake Victoria Basin. A lot more needs to be done particularly in the area of

infrastructure development. Inducement of investors who use locally available resources through instruments of monetary and fiscal policies could also enhance the establishment of industries in the Lake Victoria Basin if basic infrastructure is available to re-enforce the incentive structures. As a part of the incentive system the three Partner States use monetary and fiscal policies as key instruments in promotion of industries particularly in rural areas such as the Lake Victoria Basin.

This study has put an emphasis on initiatives that can change livelihoods in the lake Basin and promote economic development in the region. Support to identified public private partnerships, and to SME's in particular is recommended. Local or indigenous investors should particularly be supported as these trigger off other local benefits.

9.7 Interventions in trade and commerce

EAC Partner States have adopted the long-term goal of economic integration. Due to the present level of protection, trade in some commodities (maize, rice, sugar, milk, milk-products and livestock) has been hampered and consumers disadvantaged because the trade is not responsive to seasonal supply and demand factors.

To fully utilize and realize the benefits of free trade, the Partner States should intervene within the regional framework in the following key areas:

- Improvement in infrastructure: telecommunications, energy and transport especially roads, rail and inland water transport;
- Further liberalization of cross boarder trade in goods and services through elimination of intra-EAC internal tariffs;
- Freeing of cross-border movements of people and capital;
- Creation of a conducive trading environment to eliminate illegal transaction costs. Some traders avoid customs procedures only to pay special and unrecorded fees;
- Regional harmonization of the conditions for external trade including the adoption of a Common External Tariff (CET);
- Elimination of Non-Tariff Barriers to trade which include: pre-shipment inspection and declaration of Value Added Tax, Sanitary and phyto-sanitary certificates which are the major barriers for commercial trade in agricultural commodities; letters of no objection; Customs procedures which includes declaration forms and attaching origin invoices that are difficult to obtain in agriculture; numerous informal movement fees paid by agricultural commodity traders including local government cess;

9.8 Improved infrastructure and social services

There remain gaps in infrastructure required to stimulate economic development in the Lake Victoria basin. These include roads transport, rail transport, air transport,

water transport, telecommunications and the supply of electricity or alternative energy sources. Some areas remain remote to markets such as Islands leading to high post harvest losses for perishable products. Besides, some of these have scenery that could be exploited for eco-tourism. Physical planning for urban centres, land use in rural areas, and housing including water and sanitation, are areas of improvement, especially for landing sites. Social services improvement in terms of health, education, water and sanitation, housing, and environmental awareness campaigns should be emphasized.

However, in all these undertakings, linkage with existing national and local initiatives should be emphasized for sustainability reasons.

9.9 Policy and Legal reforms, enforcement support

A number of policy; legal and institutional reforms have been undertaken to enable sustainable management and development of natural resources. Uganda is also involved in implementation of regional, bilateral and international agreements and conventions. Support to implementation remains low thus affecting performance of the institutions involved, hence the continued degradation of the ecosystems.

Funding for enforcement of legislations and capacity building and for incentives for natural resources management and conservation should be scaled up under LVEMP 11, and from other sources including local sources. Local initiatives such as bye-laws by the districts should be supported, as well as community traditional conservation methods.

9.10 Decision support systems

Here, an emphasis is put on processes and tools used to reach decisions affecting the lake Victoria Basin Ecosystem and Socio-economic development. The new challenge is to make effective use of information and modern tools to improve decisions. The decision-making processes and actors involved tend to influence the chosen interventions. Though LVEMP 1 is commended for the collected information, continuity is required, and this time capacity for such data collection should be built among the various stakeholders, including at district and local levels. An initiative encountered was Fish Catch records for landing sites by BMU's. It is here recommended that:

- Information collection mechanisms be strengthened, and the best available be used in decision making;
- Transparency and effective and informed participation of stakeholders be ensured;
- Accountability be ensured, and provide for regular monitoring and evaluation;

- Support the development of tools, such as deliberative tools, information gathering tools, and planning tools;
- Support the development of frameworks and methods that can be used in the face of uncertainties in data, prediction and scale, such as cost-benefit analysis, multi-criteria evaluation, risk assessment and vulnerability analysis;
- Support lead institutions in infrastructure development and capacity building for capture of data that can be used for scenario development and analysis including Geo-Information Systems and Remote Sensing, river basin monographs;
- Coordination of efforts at multiple scales, such as linkages between LVEMP II, LVFO, FAO – TAMP, and the Nile Basin Initiative.

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ANNEXES

List of Annexes

ANNEX 1: LOGICAL FRAMEWORK

LVEMPII LOGICAL FRAMEWORK: NATURAL RESOURCES INTERVENTIONS/ INVESTMENT.

Summary of Objectives	Performance Indicators	Means Of Verification	Assumptions and Risks
OVERALL GOAL To enhance sustainable development in the lake Victoria basin through better management and use of natural resources.	▪ Better understanding of LVB natural resources ▪ Sustainable utilization of natural resources ▪ Improved livelihoods of the riparian communities	▪ Annual environmental audits. ▪ M&E reports ▪ Poverty survey reports. ▪ Workshops and business meetings	▪ Availability of Finances/ Human resources, management skills. ▪ Political will ▪ Willingness of Stakeholders to adopt the recommended management interventions
AGRICULTURE **Output** 1. Promotion of non traditional Export Crops and value addition. 2. Improved extension services 3. promotion of sustainable land use practices	▪ Agro processing and storage facilities established in 50 sub counties in the LVB. ▪ Capacity building for farmers, dissemination of improved technologies and NARS outputs in place.	▪ Annual project reports ▪ District production records ▪ Field surveys and studies	▪ Presence of adequate training facilities and logistics
Activities 1.1 Establishment of farmer groups engaged in non traditional crops 1.2 Support public-private partnership in the development of infrastructure for processing, storage 2.1 Support market linked farmer enterprises 2.2 Support outreach activities 3.1 Establish on farm demonstration sites.	▪ Improved agricultural and livestock methods using acquired technologies ▪ Agro processing centers set up at sub county level ▪ Increased Outreach	▪ Productivity reports ▪ Reports showing number of products, storage facilities set up at sub county levels. ▪ Radio production programs and print media reports.	▪ Existence of the enabling environment ▪ Stakeholders will have access to resources center and participate in various activities
FISHERIES **Outputs** 1. Artisanal fisheries supported 2. Fisheries biodiversity conserved 3. Promoting Aquaculture	▪ Availability of cold storages ▪ Improved Fish Quality ▪ Increased fish exports and local consumption ▪ Improved fishing methods and fish processing	▪ Annual reports and progress reports ▪ District fisheries reports	▪ Existence of the enabling environment ▪ Stakeholders will have access to resources center and participate in various activities
Activities **1.1** Support efforts to disseminate appropriate fishing technologies **1.2** Support development of infrastructure to limit post harvest losses 2.1 Support local authorities at sub-county level in the development and enforcement of bye-laws against destructive gears and methods 2.2 Support information sharing among experts on the status of lake fish species richness through annual workshops at regional level 3.1 Undertake capacity building of fisheries extension staff and private service providers in aquaculture development	▪ Number of staff recruited and trained ▪ Number of fisher folk organization utilizing the Investment fund ▪ % reduction in the number of illegal fishers.	▪ SME's performance and training evaluation reports ▪ BMUs monthly and weekly reports.	▪ Easy accessibility of funds to finance the proposed projects ▪ Existence of adequate human and technical capacity
WATER AND ENVIRONMENT **Output** 1. Improved monitoring and assessment of water resources 2. Extension of safe water to rural areas and sanitation 3. Bulk water transfer to water stressed areas for small scale irrigation and livestock use 4. Reduced pollutant load from rural growth centres, municipalities and Industries **Activities** 1.1 Procurement of data capture tools for 5 gauging centres 1.2 Developing monographs and information management databases.	▪ Piped water coverage in rural and urban areas increased ▪ Water quality database established ▪ % increase in safe water coverage and accessibility per capita ▪ Regional , national workshops on water resource management Number of motorized pumps completed and water treatment centres put in place	Quarterly and annual reports from WRMD WRM news letters Reports on national water quality monitoring capacities Best practice materials and workshop reports Implantation and M&E reports	▪ The stakeholders adoption of recommended funding mechanism ▪ Adequate financial resources ▪ Existence of adequate human and technical capacity ▪ Enabling social political and policy environment ▪ Maintenance of reliable MIS ▪ Willingness to meet some cost recovery fees

Summary of Objectives	Performance Indicators	Means Of Verification	Assumptions and Risks
2.1 Construction of 10 motorized pumps and water treatment centres 2.2 Supporting NGOs and CBOS in Sanitation and hygiene education and awareness 2.1 Small scale irrigation pilot schemes 2.2 Improved water supply infrastructure for livestock 1.1 Developing physical plans for gazetted landing sites 1.2 Training Industries in cleaner production techniques		Implementation and M&E reports	
Wetlands Management **Activities** 1. Preparation of community wetland management plans 2. Undertaking capacity building at district level 3. Supporting establishment of 20 wetland resource user CBOs	▪ Economic studies of the role of wetlands in sustainable development completed ▪ Wetland training and awareness programs developed	▪ Survey users of wetland management network to evaluate impact of activities ▪ Wetlands training and awareness materials ▪ Reports on the role of wetlands in sustainable development	▪ Wetland management stakeholders and experts are willing to participate and share information through project network
Water weeds control (i.e. water hyacinth and other invasive weeds) **Activities** 1. Providing BMUs in each of the shoreline district with training, tools and protective gear for water weeds removal 2. Providing boats to fisheries officers for regional water hyacinth and invasive weeds monitoring	▪ Options for controlling water hyacinth and other invasive weeds	▪ Functioning mechanisms ▪ Field visits ▪ Routine monitoring reports	▪ Political stability ▪ Resources availability ▪ Willingness of communities to participate in proposed activities
Catchment Afforestation **Output** 1. Increase forest cover in LVB 2. Forest extension services supported **Activities** 1.1 Establishment of 100 nurseries in 12 riparian districts. 1.2 Supporting forestry extension services in all riparian districts. 1.3 Supporting formation of community development groups. 1.4 Promotion of pilot apiculture projects in 5 LVB districts.	▪ % increase in forest coverage ▪ Lake basin fund established ▪ LVB tree fund established ▪ Capacity building for all stakeholders ▪ Increase in the use of other sources of energy ▪ Micro grant funds devoted to energy saving technologies ▪ Training workshops management of forest resources	▪ Annual and quarterly reports ▪ Seminar reports ▪ Micro grant reports on their impact in energy saving technology ▪ District, Forestry and NFA reports ▪ Workshop reports	▪ Additional financial resources available; ▪ Hiring additional
Environmental legislation **Output** 1. Improvement of Environmental Management Legislation **Activities** Facilitation of bye-laws development at local levels and enforcement Capacity Building and Training of key national and local stakeholders Regular review of natural resources management policies, strategies, Action Plans and legislation Support environmental education, public awareness campaigns and communication, particularly relating to sustainable use of the lake Victoria resources	▪ Increased awareness of environmental laws regulations ▪ Improved environmental legislation and enforcement ▪ Number staff and administrators, NGOs, CBOs trained	▪ Field surveys and studies ▪ Monitoring, verification and evaluation of the project ▪ Annual reports and progress reports ▪ M&E Reports	▪ Existence of the enabling environment ▪ Stake holders will have access to resources center and participate in various activities ▪ Availability of funds to finance the proposed activities ▪ Availability of suitable students from local authorities.
HEALTH **Output** 1. Strengthening health programs and services targeting major diseases particularly HIV/AIDS, Malaria, Tuberculosis and other communicable diseases **Activities** 1.1 Provision of affordable health care, facilities and trained staff in rural areas. 1.2 Education and awareness programs and outreach on preventive health care. 1.3 Strengthening awareness campaigns,	▪ Increase in population accessing Basic Health care in LVB ▪ Reduction in number of people hospitalized with Malaria, TB and other communicable diseases ▪ Reduction in prevalence in HIV AIDS	▪ Reports on Outreach programs ▪ Reports on Community Awareness campaigns ▪ Annual and quarterly Health Sector reports	▪ Availability of funds to implement the proposed program ▪ Additional necessary staff will be hired ▪ Political stability

Summary of Objectives	Performance Indicators	Means Of Verification	Assumptions and Risks
sensitization, Capacity Building on HIV/AIDS to communities 1.4 Accessibility to affordable drugs in rural areas			
MINING **Output** 1. Capacity building and improved mineral by-product management by mining groups **Activities** Support formation of artisanal miner groups, protection of environment 1.2 Provide marketing information systems for mineral products 1.3 Dissemination of acquired geo-data to artisan miners, and supporting its use in mineral resource exploration and mining	▪ Increase in mineral processing by artisanal miners in environmentally acceptable conditions ▪ Increased income for artisanal miners ▪ % Increase in volumes of minerals processed ▪ Increase in number of artisanal miners	▪ Field surveys and studies ▪ Monitoring, verification and evaluation of the project ▪ Annual reports and progress reports	▪ Existence of micro grants funds to artisanal miners ▪ Existence of an enabling environment
ENERGY **Output** 1. Increased coverage of electricity in rural areas 2. Increased use of alternative sources of energy. **Activities** 1.1 Promoting the use of alternative energy sources, such as solar energy, biogas. 1.2 Promoting of energy saving stoves 1.3 Increased rural electricity coverage in the LVB though extension of electricity to rural growth centers and landing sites.	▪ Rural growth centers connected to national grid ▪ % increase in the use of alternative sources of energy e.g. solar, biogas ▪ Increased energy saving practices by local communities	▪ Annual reports ▪ M&E reports ▪ Progress reports on the coverage of electricity in rural areas	▪ Availability of funds to finance the proposed activities ▪ Willingness of community to new technologies
COMMUNICATION & TRANSPORT **Out put** 1. Community roads constructed and maintained 2. Transport related infrastructure constructed and maintained 3. Access to information by local communities improved **Activities** 1.1 Support districts in their efforts to construct and maintain community roads 1.2 Support efforts to improve water transport as well as railway transport 1.3 Support Improvement of storage facilities, ware houses	▪ New road links and community feeder roads constructed ▪ Increased coverage of cold storage facilities. ▪ Pilot Telecenters established at sub county` level	▪ Survey reports ▪ Annual and quarterly reports	▪ Stake holder participation in various activities ▪ Availability of financial and human resources ▪ Existence of a supportive political environment
ECOTOURISM **Output** 1. Marketing of ecotourism opportunities 2. Capacity building of community eco-tourism groups and service providers 3. Improved infrastructure for community ecotourism **Activities** 1.1 Support marketing of ecotourism activities through brochures, Internet and the mass media. 1.2 Providing training on public private partnerships in ecotourism services 1.3 Support community conservation efforts by UWA in the districts of Rakai and Mbarara. 1.4 Mobilize community ecotourism groups to participate in infrastructure development.	▪ Increased number of community eco-tourism sites ▪ Increased number of tourists ▪ Improved eco-tourism services ▪ Improved stakeholders' participation.	▪ Reports on Field surveys and studies ▪ Monitoring, verification and evaluation of the project ▪ Annual reports and quarterly reports	▪ Existence of the enabling environment ▪ Stake holders will have access to resources center and participate in various activities ▪ Availability of funds to finance the proposed activities
INVESTMENT FUND **Output** 1. Establishment of the Investment Fund **Activities** 1.1 Market survey for micro-credit demand 1.2 Capacity Building of potential fund applicants 1.3 Coordinate with all the key players to ensure proper management of the fund 1.3 Provide Mass Mobilization and public awareness on the availability of funds 1.4 Training of staff to manage the fund 1.5. Local fund mobilization.	▪ Operationalization of the fund ▪ Existence of operational structures	▪ Monitoring, verification and evaluation of the project ▪ Annual reports and progress reports	▪ The stakeholders will adopt the recommended funding mechanism; demand for investment credit ▪ Adequate financial resources ▪ Existence of adequate human and technical capacity ▪ Enabling social political and policy environment

ANNEX 2: PROPOSED SECTORAL BUDGET ALLOCATION FOR LVEMP2

Sectors	Planned output	Activities	Annual Budget cost U shs[5]						Total cost U shs
			2007/08	2008/09	2009/10	2010/111	2011/12	2011/13	
Agriculture	Expanding coverage of extension services	Support outreach activities by research institutions	34,900,000	52,350,000	52,350,000	52,350,000	52,350,000	52,350,000	296,650,000
		strengthen existing and formation of new farmer institutions	52,350,000	78,525,000	87,250,000	104,700,000	78,525,000	52,350,000	453,700,000
	High value crops and animal breeds promoted	Subsidize improved technologies	43,625,000	69,800,000	104,700,000	104,700,000	69,800,000	61,075,000	453,700,000
	Sustainable land use practices promoted	Establish on farm demonstration sites	78,525,000	157,050,000	157,050,000	157,050,000	17,450,000	17,450,000	584,575,000
		Undertake awareness campaigns to promote safe handling of and use of agrochemicals	43,625,000	87,250,000	87,250,000	104,700,000	87,250,000	43,625,000	453,700,000
	mechanized agriculture and value addition improved	Support dissemination of small scale agro-processing technologies through agricultural shows at district levels	52,350,000	52,350,000	52,350,000	52,350,000	52,350,000	52,350,000	314,100,000
		Construction of physical infrastructure s for the livestock industry e.g. slaughter facilities, beef and milk processing plants	34,900,000	139,600,000	139,600,000	139,600,000	34,900,000	34,900,000	523,500,000
	Capacity Building and training	Workshops /seminars in the 10 districts	52,350,000	52,350,000	52,350,000	52,350,000	52,350,000	52,350,000	314,100,000
		Mass Mobilization and community awareness	52,350,000	52,350,000	52,350,000	52,350,000	52,350,000	52,350,000	314,100,000
	[6]Administrative costs 10%		21,812,500	65,437,500	87,250,000	109,062,500	87,250,000	65,437,500	436,250,000
	[7]Technical Assistance 5%		10,906,250	32,718,750	43,625,000	54,531,250	43,625,000	32,718,750	218,125,000
Subtotal			477,693,750	839,781,250	916,125,000	983,743,750	628,200,000	516,956,250	4,362,500,000
Fisheries	Increased fish catch and reduction of post harvest losses	Development of landing jetties, washing slabs and fish storage facilities at 10 landing sites.	104,700,000	244,300,000	261,750,000	17,450,000	17,450,000	17,450,000	663,100,000

[5] The Exchange rate is US $1= Ushs1745 as per BOU average exchange rate on 28th Jan 2007

[6] Admnistrative cost take 10% of the Sectoral allocation

[7] Technical assistance is 5% of the Budget.

Sectors	Planned output	Activities	Annual Budget cost U shs[5]						Total cost U shs
			2007/08	2008/09	2009/10	2010/111	2011/12	2011/13	
		Provision of computers to DFOs in 10 districts and BMUS	17,450,000	17,450,000	-	-	-	-	34,900,000
	Aquaculture development	Development of five fish collection centers	17,450,000	52,350,000	52,350,000	17,450,000	8,725,000	8,725,000	157,050,000
		Establishing one model demonstration ponds in each district	17,450,000	69,800,000	69,800,000	69,800,000	8,725,000	8,725,000	244,300,000
		Establishing 2 fish fry centers.	17,450,000	69,800,000	43,625,000	43,625,000	26,175,000	26,175,000	226,850,000
	Capacity Building	Regular training of artisanal fishers, fish farmers. BMUs.	34,900,000	52,350,000	52,350,000	43,625,000	17,450,000	17,450,000	218,125,000
		Facilitate improved enforcement of fishing regulations	17,450,000	17,450,000	17,450,000	17,450,000	17,450,000	13,960,000	101,210,000
	Fisheries biodiversity conservation	Restoration of fish bleeding grounds	34,900,000	47,115,000	17,450,000	-	17,450,000	17,450,000	134,365,000
	Administrative costs 10%		10,470,000	31,410,000	41,880,000	52,350,000	41,880,000	31,410,000	209,400,000
	Technical Assistance 5%		5,235,000	15,705,000	20,940,000	26,175,000	20,940,000	15,705,000	104,700,000
Subtotal			277,455,000	617,730,000	577,595,000	287,925,000	176,245,000	157,050,000	2,094,000,000
Water Resource , Supply and sanitation	Improved assessment of water resource	Procurement of data capture tools for 5 gaugiing stations	-	157,050,000	26,175,000	13,960,000	10,470,000	10,470,000	218,125,000
		Development of monographs and information management databases	17,450,000	113,425,000	113,425,000	26,175,000	17,450,000	8,725,000	296,650,000
	Extension of safe water to rural areas and sanitation	Construction of 10 motorized pumps and water treatment centers	17,450,000	139,600,000	139,600,000	17,450,000	17,450,000	17,450,000	349,000,000
	Water for livestock use and irrigation	Small scale pilot irrigation schemes	43,625,000	157,050,000	69,800,000	87,250,000	8,725,000	8,725,000	375,175,000
		Valley Tanks /Dams	43,625,000	139,600,000	34,900,000	8,725,000	8,725,000	8,725,000	244,300,000
	Public awareness	Support for hygiene education	26,175,000	34,900,000	34,900,000	34,900,000	34,900,000	26,175,000	191,950,000
	Technical Assistance	Assessment of status of laboratories	26,175,000	43,625,000	-	-	-	-	69,800,000
		capacity building for laboratory staff	17,450,000	52,350,000	52,350,000	52,350,000	52,350,000	34,900,000	261,750,000
		Regular monitoring of water quality trails	26,175,000	34,900,000	34,900,000	34,900,000	34,900,000	26,175,000	191,950,000
	Administrative costs 10%		12,215,000	36,645,000	48,860,000	61,075,000	48,860,000	36,645,000	244,300,000

Sectors	Planned output	Activities	Annual Budget cost U shs[5]						Total cost U shs
			2007/08	2008/09	2009/10	2010/111	2011/12	2011/13	
Subtotal			230,340,000	752,095,000	528,735,000	322,825,000	223,360,000	167,520,000	2,443,000,000
Wetlands management	Wetland management plans prepared	Preparation of 20 community wetland management plans	34,900,000	69,800,000	104,700,000	104,700,000	69,800,000	61,075,000	444,975,000
	wetland user groups supported	Supporting wetland user groups	17,450,000	52,350,000	52,350,000	43,625,000	43,625,000	26,175,000	235,575,000
	Updating wetland inventories	Updating wetland inventories	17,450,000	43,625,000	52,350,000	61,075,000	34,900,000	-	209,400,000
	Administrative costs 10%		5,235,000	15,705,000	20,940,000	26,175,000	20,940,000	15,705,000	104,700,000
	Technical Assistance 5%		-	10,470,000	10,470,000	13,087,500	10,470,000	7,852,500	52,350,000
Subtotal			75,035,000	191,950,000	240,810,000	248,662,500	179,735,000	110,807,500	1,047,000,000
Water weeds control	Capacity Building	Providing BMUs in 10 districts with training,	8,725,000	34,900,000	43,625,000	52,350,000	34,900,000	17,450,000	191,950,000
		Boats, tools and protective gear for water weeds removal	26,175,000	26,175,000	-	-	-	-	52,350,000
	GIS and Information System	Installation of GIS and RS data for monitoring purposes	8,725,000	87,250,000	43,625,000	34,900,000	17,450,000	17,450,000	209,400,000
	Reduced prevalence of water hyacinth	Rehabilitation of 10 weevil rearing centers	17,450,000	17,450,000	17,450,000	17,450,000	17,450,000	17,450,000	104,700,000
	Technical Assistance	Research on appropriate weed control mechanism	17,450,000	17,450,000	17,450,000	17,450,000	-	-	69,800,000
	Administrative costs 10%		3,490,000	10,470,000	13,960,000	17,450,000	13,960,000	10,470,000	69,800,000
Subtotal			82,015,000	193,695,000	136,110,000	139,600,000	83,760,000	62,820,000	698,000,000
Forestry	Increase forest coverage in LVB	100 tree nurseries in 12 districts	34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	209,400,000
	Forestry Extension services in 12 districts supported	Establish and facilitate extension office and services at sub county level (24 sub counties)	26,175,000	43,625,000	43,625,000	43,625,000	43,625,000	26,175,000	226,850,000
	Capacity building	Training and public awareness	26,175,000	34,900,000	43,625,000	17,450,000	17,450,000	17,450,000	157,050,000
		Support the formation of 50 community development groups in 10 districts	34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	-	174,500,000
	Apiculture promoted	Promotion of Apiculture in 5 LVB districts	17,450,000	26,175,000	34,900,000	34,900,000	34,900,000	17,450,000	165,775,000

Sectors	Planned output	Activities	Annual Budget cost U shs[5]						Total cost U shs
			2007/08	2008/09	2009/10	2010/111	2011/12	2011/13	
	Regulation Enforcement	Facilitate development of appropriate tree planting bye-laws in 10 districts	17,450,000	17,450,000	17,450,000	17,450,000	17,450,000	17,450,000	104,700,000
	Administrative costs 10%		6,107,500	18,322,500	24,430,000	30,537,500	24,430,000	18,322,500	122,150,000
	Technical Assistance 5%		3,053,750	9,161,250	12,215,000	15,268,750	12,215,000	9,161,250	61,075,000
Subtotal			166,211,250	219,433,750	246,045,000	229,031,250	219,870,000	140,908,750	1,221,500,000
Environmental Legislations		Facilitate development of byelaws at local levels and their enforcement	17,450,000	26,175,000	34,900,000	34,900,000	34,900,000	43,625,000	191,950,000
		Capacity building and training of key national and local stakeholders	34,900,000	43,625,000	43,625,000	52,350,000	43,625,000	43,625,000	261,750,000
		Support environmental Education and awareness campaigns on sustainable use of LVB natural resources.	26,175,000	29,665,000	31,410,000	34,900,000	26,175,000	26,175,000	174,500,000
	Administrative costs 10%		10,470,000	10,470,000	13,960,000	13,960,000	10,470,000	10,470,000	69,800,000
Subtotal			88,995,000	109,935,000	123,895,000	136,110,000	115,170,000	123,895,000	698,000,000
Health		Investment in prevention and control of major communicable nd water borne diseases	52,350,000	52,350,000	69,800,000	69,800,000	52,350,000	52,350,000	314,100,000
		Education and awareness programs and outreach on preventive health care	34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	209,400,000
		strengthening awareness campaigns and sensitization on HIV/AIDSto communities	34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	209,400,000
		Increase accessibility to drugs through improve extension services	34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	209,400,000
	Administrative costs 10%		17,450,000	17,450,000	17,450,000	17,450,000	17,450,000	17,450,000	104,700,000
Subtotal			174,500,000	174,500,000	191,950,000	191,950,000	174,500,000	174,500,000	1,047,000,000
Mining	Strengthen and develop artisanal mining.	Provide small scale mining tools to 20 miners groups	27,920,000	34,900,000	34,900,000	34,900,000	34,900,000	24,430,000	191,950,000
			-	-	-	-	-	-	-

Sectors	Planned output	Activities	Annual Budget cost U shs[5]						Total cost U shs
			2007/08	2008/09	2009/10	2010/111	2011/12	2011/13	
		Equip 3 regional office with necessary laboratory equipment	26,175,000	34,900,000	34,900,000	34,900,000	34,900,000	26,175,000	191,950,000
	Training to artisanal miners	Workshops/ seminars p.a. in 5 districts	17,450,000	26,175,000	26,175,000	26,175,000	26,175,000	26,175,000	148,325,000
		Provision of market information systems	8,725,000	17,450,000	17,450,000	17,450,000	17,450,000	17,450,000	95,975,000
	Administrative costs 10%		3,490,000	10,470,000	13,960,000	17,450,000	13,960,000	10,470,000	69,800,000
Subtotal			83,760,000	123,895,000	127,385,000	130,875,000	127,385,000	104,700,000	698,000,000
Energy	Increased coverage of electricity in rural areas	Support rural electrification	104,700,000	139,600,000	139,600,000	139,600,000	104,700,000	69,800,000	698,000,000
	Promotion of the use of alternative sources of energy	Promotion of the use of alternative sources of energy e.g solar, biogas	87,250,000	87,250,000	122,150,000	122,150,000	104,700,000	87,250,000	610,750,000
		Promotion of the use o energy saving stoves	17,450,000	17,450,000	17,450,000	17,450,000	17,450,000	17,450,000	104,700,000
	Administrative costs 10%		26,175,000	26,175,000	26,175,000	26,175,000	26,175,000	26,175,000	157,050,000
Subtotal			235,575,000	270,475,000	305,375,000	305,375,000	253,025,000	200,675,000	1,570,500,000
Transport and Communication	Transport related infrastructure maintenance supported	Support districts development plans in construction and maintenance of roads	174,500,000	174,500,000	174,500,000	174,500,000	174,500,000	174,500,000	1,047,000,000
		Support efforts to improve water transport	87,250,000	87,250,000	87,250,000	87,250,000	87,250,000	87,250,000	523,500,000
	Storage facilities constructed	support improvement of storage facilities, ware houses	69,800,000	52,350,000	69,800,000	34,900,000	52,350,000	34,900,000	314,100,000
	Administrative costs 10%		34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	209,400,000
Subtotal			366,450,000	349,000,000	366,450,000	331,550,000	349,000,000	331,550,000	2,094,000,000
Ecotourism	Marketing ecotourism	Support marketing of ecotourism activities through brochures, Internet and mass media	34,900,000	87,250,000	87,250,000	87,250,000	87,250,000	78,525,000	462,425,000
	Improve infrastructure	Ecological tourist sites (walkways, information centers, craft markets)	34,900,000	43,625,000	43,625,000	43,625,000	43,625,000	26,175,000	235,575,000
		Purchase 2 boats to link to Kome islands	-	174,500,000	-	-	-	-	174,500,000

Sectors	Planned output	Activities	Annual Budget cost U shs[5]						Total cost U shs
			2007/08	2008/09	2009/10	2010/111	2011/12	2011/13	
	Capacity Building	Training of public private partnerships in ecotourism services	17,450,000	34,900,000	34,900,000	34,900,000	26,175,000	17,450,000	165,775,000
	Administrative costs 10%		6,107,500	18,322,500	24,430,000	30,537,500	24,430,000	18,322,500	122,150,000
	Technical Assistance 5%		3,053,750	9,161,250	12,215,000	15,268,750	12,215,000	9,161,250	61,075,000
Subtotal			96,411,250	367,758,750	202,420,000	211,581,250	193,695,000	149,633,750	1,221,500,000
Investment fund	Establishment of the Investment fund	Capacity building for potential fund applicants	52,350,000	52,350,000	34,900,000	-	-	-	139,600,000
		Mass mobilization awareness and sensitization on the availability of fund	17,450,000	34,900,000	17,450,000	17,450,000	17,450,000	17,450,000	122,150,000
		Training of staff on how to manage the fund	69,800,000	69,800,000	34,900,000	-	-	-	174,500,000
	Technical Assistance		34,900,000	34,900,000	34,900,000	34,900,000	34,900,000	17,450,000	191,950,000
	Administrative costs		69,800,000	69,800,000	69,800,000	69,800,000	69,800,000	69,800,000	418,800,000
	Project funding		698,000,000	1,047,000,000	1,396,000,000	1,047,000,000	1,047,000,000	698,000,000	5,933,000,000
Subtotal			942,300,000	1,308,750,000	1,587,950,000	1,169,150,000	1,169,150,000	802,700,000	6,980,000,000
GRAND SUBTOTAL			**3,296,741,250**	**5,518,998,750**	**5,550,845,000**	**4,688,378,750**	**3,893,095,000**	**3,043,716,250**	**26,175,000,000**

ANNEX 3: LESSONS LEARNT UNDER LEVEMP

NO.	Component	Objectives	Achievements	Comment
1	Catchment Afforestation	• Improve the management of forest reserves. • Create new forest reserves. • Promote conservation of forests outside forest reserves. • Strengthen institutional capacity for effective management of the forest resources in the catchment • Raise awareness to promote forest management and active participation of local community operators. • Promote tree growing.	• Promoted tree seedling production by establishing 10 central nurseries, 2 commercial nurseries • Replanted and managed degraded forest reserves by replanting 144.6ha of degraded forest reserves and re opened 15km of boundary • Protected 670ha of central forest reserves in Mwiri, Lyirimbiri, Nabanga and South Busoga against fire and illegal activities. • Promoted stakeholder participation and participatory/collaborative approach in forest resource management. • Conducted public awareness, training & workshops.	• Need for increased public awareness • Inconsistent flow of funds from LVEMP • Interference of local politicians with activities of the component
2	Land use management	• Quantify the magnitude of soil erosion and nutrient loss from many bad land use practices. • Identify appropriate remedial measures and interventions for arresting the degradation process by developing sustainable agricultural systems in the catchment. • Develop systems to promote soil and	• Establishment of Soil and water conservation demonstrations as spring board for technology dissemination: A total of 26 demonstrations were established in Rakai and 2 in KARI • Micro-projects: Provision of shallow wells and water tanks for safe and clean drinking water • River discharge and water quality monitoring Data was collected from 3 Hydrological stations in Rakai	• More funds are needed to enhance existing capacity • No policies on land tenure • Need for expanded training program and sensitization at community level to enable people engage

NO.	Component	Objectives	Achievements	Comment
		water conservation. • Establish methods to estimate the effects of land use change planning on pollution loads to the lake. • Establish water quality monitoring network in selected areas. • Build capacity for monitoring and assessing water quality and land use in the region. • Prevent further damage to the land and hence to the lake ecosystem. • Establish a reliable regular recording system for the types and quantities of pesticides and fertilizers used in the lake catchment. • Promote efficient and safe use of agro-chemicals. • Assess amounts of agro-chemicals reaching the lake waters in the test micro-catchments. • Sensitize the public on hazards of over application and abuse of agro-chemicals and provide a basis for policy and practice to control pollution from agro-chemicals.	• Rainfall data has been collected from rain gauge network • Land resource inventories and land use/cover reconstruction for selected areas in the catchment have been initiated and preliminary maps developed. Work on development of Land Quality Indicators [LQIs] and strategies to monitor land resources and performance of agro-ecosystems has been initiated. • Agro-chemicals use database has been established and regularly updated. • Assessment of persistence of agro-chemicals in the environment: field trial has been established to monitor movement/persistence of agro-chemicals and the associated transformation products. • Quantification of atmospheric depositions: dry and wet sampling equipment station established at Kakira sugar estate; data collected and preliminary results compared with depositions around Lake Malawi. Provisional data show presence of DDT, Lindane and Endosulfan implying that Chlorinated pesticides that were banned long ago [most regions] are still in use in the lake basin. • Land use resource inventory and land use cover map developed for Rakai and Mayuge. • 5 Micro-catchment management committees	in collective actions for the environment • Liaise with catchment Afforestation to improve soil conservation. • More stakeholders need to be trained.

NO.	Component	Objectives	Achievements	Comment
			formed at village level in Rakai. • Computerized database on types and quantities of agro-chemicals in use in the catchment (Uganda) has been established and is regularly updated every six months • 50 water tanks and 3 protected wells constructed in Rakai district.	
3	**Wetlands Management**	• Undertake a rapid assessment of wetlands of the Lake Victoria basin, leading to an inventory of the wetlands and assessment of their buffering capacities. • Carry out an economic evaluation of wetlands buffering services provided to Lake Victoria. • Identify and quantify the nature and magnitude of threats to wetlands in order to propose mitigation measures. • Formulate guidelines for wetland management. • Quantify the economic benefits from wetland products. • Develop management strategies for their sustainable utilization. • Initiate pilot activities to demonstrate wise use of wetlands in the lake basin.	• Rapid quantitative assessment of individual wetlands in the basin has been completed in terms of base maps, ground truthing and report writing, production and updating of maps. • Completed inventory of wetlands in Lake Victoria catchment. • Field based investigation of nutrients: collected data for 13 consecutive months; started on data analysis; technical committee set up to periodically review data collected. • Quantitative assessment of buffering function of wetlands (hydrology) • Comparison of buffering capacity of some wetland systems was done. • Cost benefit analysis of wetlands use was completed by the Consultant. • Guidelines were produced for Wetland Fish Farming, Wetland Capture Fisheries, and Wetlands and the Law.	• Delays in disbursement of funds affected the activities. • Measurement were hindered by natural phenomena e.g. drought • Inadequate staff to handle interventions delayed implementation.

NO.	Component	Objectives	Achievements	Comment
		• Train communities in wise wetland use practices.	• Surveys were carried out to establish the extent and intensity of traditional wetland production and management systems. • Estimation of production rates and biomass standing crop of papyrus, Phoenix and Rattan was done. • Conducted studies to evaluate suitability of wetland soils for crop production. • Developed strategies for rehabilitation of specific degraded wetlands. • Promoted community participation in implementation of wetlands through demonstration projects illustrating wise use and management practices. • Provided training to core teams of wetland specialists and local communities.	
4	**Industrial & Municipal Waste Management.**	• Strengthen and improve the management of industrial and municipal waste. • Assess the contribution of urban run-off to lake pollution. • Alleviate overall environmental degradation and the corresponding socio-economic decline. • Investigate the viability of using constructed wetlands in the tertiary treatment of industrial wastes. • Investigate the viability of using a well	• Identified Agencies and NGOs, industries and communities having direct/indirect roles in the lake. • Surveyed 60 industries in Kampala, Jinja, Masaka, Mbarara and Entebbe. • Continually monitored streams and channels in Kampala catchment. • Initiated a joint strategic alliance for the management of the Nakivubo wetland. • Visited and sensitized shoreline settlements in	• Delayed approval of funds slowed down implementation. • Need for continuous monitoring of streams and channels in the Catchment • Lack of public awareness on the effects of pollution on the water systems and the lake.

NO.	Component	Objectives	Achievements	Comment
		managed natural wetland in the tertiary treatment of municipal wastes. • Rehabilitate the Bugolobi Sewage Treatment Works (BSTW) in order to improve the quality of the final effluent and enable it meet the required national standards for discharge of effluent into the receiving environment.	the lake districts as well as the general public. • Quantified urban run-off in major urban centers. • Carried out M.Sc, on-job, and computer training for staff. • Carried out environmental audit for the Luzira swamp. • Completed construction of Tertiary Industrial Effluent pilot plant. • Assessed water quality in the ponds /wetland and swamp lake interface. • Determined wastewater flow in the swamp. • Determined biomass density of the dominant macrophytes. • Handled the distribution of wastewater. • Procured three generators for the pumping stations at Bugolobi Sewage Treatment Works (BSTW), and construction of generator houses commenced to achieve 24-hr operation. • Repaired 100 m of burst section low level rising main to inlet works leading to increase in raw sewage flow into BSTW and thus reduced pollution loading into the lake	
5	**Water Quality Monitoring**	• Provide detailed and usable information on the characteristics of the waters of Lake Victoria. • Establish and operationalise an	• Parameters, frequency and protocols for monitoring have been determined and agreed upon both nationally and regionally. • Data sets of various categories have been	• Low participation of communities especially in water quality monitoring

NO.	Component	Objectives	Achievements	Comment
		integrated water quality monitoring network so as to generate information on the physical status, chemical characteristics and biological composition of the lake. • Develop and operationalise a water quality management model to be used as a planning tool in the management scenarios of Lake Victoria and its ecosystem. • Contribute to the social benefits that can accrue to the community as a result of accessing lake water of good quality. • Develop, enforce and regularize water quality standards and monitoring compliance.	collected, analyzed and input into the database and water quality model. • Data collected is being compared with historical data to find out the difference between what was happening years ago and now. • Regular joint monthly and quarterly monitoring cruises are being conducted. • A laboratory has been set to handle the high number of samples resulting from increased monitoring. • Staff have been trained in specialized fields related to the component activities, especially in sampling and analysis. • The Water Quality Model was set up and is being updated regularly. • Mechanisms for monitoring the most prevalent diseases in the lake basin and reducing them ere being set up.	• There is no time series of hydraulic conditions, current velocities and local differences in water levels. Hence there is need to establish these time series.
6	**Water Hyacinth control**	• Establishment of capacity at both national and local levels for management and control of the spread of the water hyacinth. • Ensuring, through a combination of mechanical and manual control methods that the weed does not interfere with activities at sites of strategic importance to the nation.	• Overall, visible reduction in weed cover over the lake has been realized over the past four years. It is estimated that weed cover reduction of 80% had been realized by 1998/99 due to both biological and mechanical/manual control methods. • Mass rearing and release of weevils from Namulonge and on-shore rearing stations continued smoothly.	• There is no database of quantities that have been extracted • There are weak linkages/ coordination within riparian states • Weak or no National policy and legislation on water hyacinth

NO.	Component	Objectives	Achievements	Comment
		• Establishing and maintaining a viable population of biological control agents that will in the long term control the water hyacinth. • Mobilisation of efforts of all stakeholders and especially riparian communities to manage the weed. • Reduction of water hyacinth in the lake to manageable levels and ensuring that the weed does not multiply beyond such levels.	• Pathogens of potential use for water hyacinth control have been isolated. They include Cercospora sp., Alternaria sp. and Acronerium sp. Evaluation of their efficacy has been initiated. • 12 on-shore weevil rearing stations for biological control were established in riparian districts. • Water hyacinth masses at Owen Falls Dam have been drastically reduced and disruptions to power generation have reduced. A weed maintenance control programme is in place at the site. • Weed masses at Port Bell have been reduced to eliminate the weed's interference to docking of ships. A weed maintenance control programme is in place at the site. • Through the establishment of Landing Sites Management Committees (LMCs), riparian communities have been mobilized to participate in weed removal. Village stakeholder vigilance against the weed is being sustained through workshops, seminars and barazas. Selected landing sites in the lake districts were provided with hand tools and protective gear for manual removal of water hyacinth. • The Component also facilitated the training of Ph.D. and Msc students; short-term on-job training courses were conducted for Extension Staff and communities based at the landing sites;	control. There is constant concern for the resurgence of the weeds

NO.	Component	Objectives	Achievements	Comment
			village stakeholder sensitization workshops were also conducted in the lake districts.	
7	**Fisheries Management**	Objectives: To improve the overall management, utilization and protection of fisheries resources of Lake Victoria by strengthening extension activities, enhancing enforcement, protection of breeding areas/seasons and harmonization of existing fisheries legislation in the three riparian governments, improving fishing technology and introducing new skills, and enhancing community participation in fisheries management through training and micro-projects.	• Facilitated districts by providing funds and logistics. • Refurbished the Administrative blocks. • Sensitized district leaders, councilors, District Fisheries Officers (DFOs) and fisheries staff. • Sensitized and trained stakeholders on fry fish production and new fishing techniques and law enforcement • Promotion of village aquaculture activity. • Developed capacity to provide extension services through local government. • Drafted the National Fisheries Policy and Reviewed the Fish Act • Conducted monitoring and surveillance of the lake. • A number of apprehensions were posted and charges preferred for possessions of immature fish and illegal gears. • Established pilot Beach Management Units and Identified fish breeding areas. • Regularly inspected and certified fish factories. Fish ban on export was lifted as a result. • Promoted community participation in fisheries management.	• Information on new technologies and skills should be passed on fishing communities • A lot more sensitization and training of stakeholders on new fishing techniques and law enforcement need to be done

NO.	Component	Objectives	Achievements	Comment
			Conducted regular liaison, consultative and technical meetings.	
8	**Fisheries Research**	• To generate and disseminate information, methods and advice for: • sustainable development and management of the fisheries resources; • conservation of aquatic biodiversity; • enhancement of fish production and restoration of the population of previously important commercial species through fish farming; • development of options for optimization of socio-economic benefits from fisheries with greater community participation; • control of invasive weeds especially water hyacinth; • strengthening the capacity for information acquisition packaging and accessibility; • Building the capacity for implementing the above objectives on a sustainable basis.	• Research activities of this component have identified factors affecting biodiversity patterns among the Victoria and satellite lakes. • FIRRI museum and aquaria have been rehabilitated and several new aquaria set up in schools and public places. • Drafts of books have been made and are available. Theses, educational posters and charts have been prepared. • Breeding biology of Labeo victorianus and Bagrus docmac has been established. • Fresh broodstocks of O. niloticus and Clarias gariepinus have been collected. • Contamination of O. niloticus fry by other fish species has been eliminated. • Surveys of on-farm resources have been conducted and analysis done. • Baseline survey of status and potentials for aquaculture development in the Lake Victoria basin has been done. • Various books on aquaculture have been produced. • Several workshops have been conducted involving farmers and extension staff.	• A database would improve on information gathering, storage and dissemination • Information should be disseminated to fishers, resource managers and major stake holders

NO.	Component	Objectives	Achievements	Comment
			• A total of 186 socio-economics publications and other materials on Lake Victoria have been identified and reviewed. • Other studies are focusing on: social and economic implications of the current fishery distribution patterns; impacts of socio-cultural practices of fishing communities on all levels and use of sanitary, handling and processing of fish; economic viability of fisheries enterprises on the lake to improve the income condition of artisanal fishermen; evaluation of the impact of micro projects on the local communities; estimation of the economic losses/gains attributed to water hyacinth impacts at local, national and regional levels. • Produced various reprints, dissertations, and information dissemination materials (brochures, posters, newspaper supplements, etc.).	
9	**Establishment of LVFO**	• Foster co-operation amongst the Contracting Parties (Kenya, Tanzania and Uganda) in matters regarding Lake Victoria Fisheries. • Harmonize national measures for the sustainable utilization of the living resources of the lake. • Develop and adopt conservation and management measures to assure the Lake's ecosystem health and	• Renovated and Operationalized the LVFO Secretariat. • Organized a number of statutory meetings and Regional meetings, workshops and conferences. • Organized and led the first Mission to the Great Lakes of America by top Managers of Lake Victoria Fisheries. • Formulated the Strategic Vision for Lake Victoria Fisheries. • Compiled a directory of freshwater Scientists for	• Plans should be designed to ensure Sustainability of the Organization after LVEMP

NO.	Component	Objectives	Achievements	Comment
		sustainability of the living resources.	Lake Victoria. • Participated in the development of the Lake Victoria Fisheries Database, and in the regional Frame Survey, and Socio-Economics Task Forces. • Executed outreach activities by visiting and sensitizing district officials and fisher communities. • Established partnerships and signed Memoranda of Understanding (MOU) with various organizations including United Nations University /International Network on Water, Environment and Health, University of Zurich, United Nations Environment Programme, FAO, and Nile Breweries.	
10	**Support Zoology Department of MUK**	• To instill success snd continuity of the LVEMP by providing human resources capacity building at Msc and Ph.D. levels and knowledge upgrade through short courses.	• The component has trained Project Staff at the levels of Ph.D. and Msc. and short courses. So far 14 Ph.D. and 26Msc. have been trained • Additional personnel hired to support institution's staff • Enhance capacity of districts through short courses for extension workers	• Needs to enhance the skills of Technicians who have a direct impact on local communities e.g. Extension workers

ANNEX 4: ENVIRONMENTAL POLICIES AND LAWS

National Sectoral Policies	
The National Environment Policy, 1995	"sustainable social and economic development which maintains or enhances environmental quality and resource productivity on a long term basis, that meets the need of the present generation without compromising the ability of future generations to meet their own needs".
The Water Policy, 1995	The National Water Policy promotes an integrated approach to manage the water resources in ways that are sustainable and most beneficial to the people of Uganda.
The Wildlife Policy	This policy aims at; • Conservation in perpetuity the resource within the national parks and other wildlife areas, and to enable the people of Uganda and the global community to derive ecological, economic, aesthetic, scientific, and educational benefits from wildlife; • Generating revenue to support these conservation efforts and hereby contribute to the national economy.
The National Policy for the Conservation and Management of Wetland Resources, 1995	The wetlands policy aims at; • Establishing the principles by which wetland resources can be optimally used now and in the future; • Ending practices which reduce wetland productivity; • Maintaining the biological diversity of natural or semi-natural wetlands; • Maintaining wetland functions and values; • Integrating wetlands concerns into the planning and decision making of other sectors.
The Fisheries Policy, 2000	This policy aims at "an ensured sustainable exploitation of the fishery resources at the highest possible levels, thereby maintaining fish availability for both present and future generations without degrading the environment"
The Mineral Policy	
The National Biotechnology and Biosafety Policy, 2004	Makes provisions for the safe development, transfer and application of modern biotechnology; and makes provisions for institutional framework for biosafety, to minimise the possible negative impacts of modern biotechnology on the conservation and sustainable use of biological diversity (in line with Article 8(g) of the Convention).
National Forestry Policy, 2001	This policy provides for conservation of forest biodiversity and its management in support of local and national socio-economic development and international obligations.
The National Agricultural Research Policy	The mission for agricultural research is "to generate and disseminate appropriate safe and cost-effective techniques, while enhancing the natural resource base. The Policy Priority No.5 puts special focus on recent developments related to the agricultural sector including genetic resources conservation and biotechnology, among other things. It further calls for fair agricultural policies and

	promotion, as appropriate the development and maintenance of diverse farming systems that enhance the sustainable use of agricultural biological diversity and other natural resources, as well as strengthening research which enhances and conserves biological diversity by maximizing intra and inter-specific variation for the benefit of farmers.

Environmental Laws

The National Environment Act CAP 153
This act provides for sustainable management of the environment, establishes the National Environment Management Authority, which among other things is empowered to coordinate, monitor, supervise and issue guidelines for sustainable environmental management and the conservation of biological diversity.

Section 42 of this Act empowers NEMA, in consultation with lead agencies, to address causes of biodiversity loss by issuing guidelines and prescribing measures for the conservation of biological diversity and by specifying national strategies, plans and programmes for the conservation and sustainable use of the biological diversity. The Act further provides for the conservation of biological resources *in situ* and *ex-situ*, management of river banks and lake shores, wetlands, hilly and mountainous areas, forests, and for the regulation of access to genetic resources. The Act also provides for the preservation of biological diversity.

The National Environment Management Authority has further enacted subsidiary regulations that are of relevance to the Convention and cross cutting biodiversity conservation issues such as:

ix) The National Environment (Wetlands, Riverbanks and Lakeshores Management) Regulations, 2000;
x) National Environment (Hilly and Mountainous Area Management) Regulations, 2000;
xi) The Environmental Impact Assessment Regulations (1998);
xii) The National Environment (Access to Genetic Resources and Benefit Sharing) Regulations, 2004;
xiii) The National Environment (Minimum standards for management of Soil Quality) Regulations, 2000;
xiv) The National Environment (Standards for discharge of Effluent into Water or on Land) Regulations, 1999;
xv) The National Environment (Waste Management) Regulations, 1999;
xvi) The National Environment (Management of Ozone Depleting Substances and Products) Regulations, 2001.

The National Forestry and Tree Planting Act (2003)
The National Forestry and Tree Planting Act (2003) provides for the conservation of forests and trees and their sustainable use. It goes further to define the institutional arrangements for the management and sustainable use of forestry resources in the country and the roles of each of the institutions and stakeholders. It further provides for collaborative forest management with communities as well as recognise forest ownership rights of communities and

individuals for forest resources located on their land. The Forestry and Tree Planting Act further provides for the maintenance of and establishment of forest reserves.

The Uganda Wildlife Act (1996)
The Wildlife Act, 1996, provides for the sustainable management of wildlife, as well as establishing the Uganda Wildlife Authority, a corporate body responsible for the management of Uganda's wildlife resources. It provides for, among other things, community conservation and wildlife user rights, a provision that enables communities and stakeholders to participate and benefit from wildlife resources. The Act provides for the maintenance and management of National Parks, Wildlife Reserves and other forms of wildlife protected areas (as required under Article 8 of the Convention). UWA is thus responsible for management of fisheries resources in protected areas, such as lake Mburo.

The Water Act, CAP 152
Provides for the use, protection and management of water resources and supply, among other things. The importance of water in sustenance of all biological diversity and as a habitat of aquatic biodiversity need is more than obvious.

The regulations that have been developed in relation to this act include;

- The Water Resources Regulations, 1998;
- The Water (Waste Discharge) Regulations, 1998.

The Fish Act (2003)
The Act makes provisions for the control of fishing, the conservation of fish and related matters. These include restrictions on fishing methods, prohibition of use of poison, noxious substances, explosives and electrical devises in fishing, Requirement for licensing of fishing vessels, fish processing and marketing, non-citizens engaged in fishing, Restrictions on introduction of alien fish species,
Authority of the Minister to restrict fishing seasons, prohibiting destructing fishing methods, and making regulations enable implementation of the Act.

Other important legislation to Fisheries include the Vessels (Registration) Act, 1964, which facilitates knowledge of boat types in use, monitoring and controlling fish catch effort; the Limitation of number of nets per vessel (S.I 47, 228) and the limitation of numbers of licenses (S.I. 5, 228) applicable to fragile water bodies excluding lake Victoria; the Fish and Crocodile (immature Fish Instrument) S.I.5 of 1981 set out the length of immature fish, for *Lates niloticus* and *Oreochromis niloticus;* The Fishing (Amendment) Rules S.I. 10 of 1992 regulating use of seine nets. The Fish (Beach management) rules, 2003 provide for establishment of a beach management unit (BMU), election of office bearers, registration of BMUs, roles of different key players under the SI, financing and supervision of BMU activities.

ANNEX 5: NGOS & CBOS IN LAKE VICTORIA BASIN

District	Name Of Organization	Postal Address	Contact Person
Kalangala	Agalyawamu	Box 2 Kalangala	Betty Mukasa
	Bufumira Islands Development Association	Box 2 Kalangala	Kasirye Augustine
	Bussumba Inititiative For Adult Education And Development Organisation	Box 2 Kalangala	Ssendege Fred
	Few But Determined	Box 9 Kalangala	Kizza Lydia
	Kalangala Aids Care Education And Training	Box2 Kalangala	Kizza Stephen
	Kalangala District Farmers Assoc.	Box34 Kalangala	Nsubuga Constantino
	Kalangala District Womens Association	Box 02	Nanyonjo Betty
	Kalanganett	Box 2 Kalangala	Mulaaza Molly
	Mothers Union		Mary Lutaaya
	Nawou Kalangala Branch		Dambya Stella
	Ssese Islands Community Development Organisation	Box 17 Kalangala	Bisaso Ntamu
Kampala	Bucadef	34071 Mengo, Kampala	Mukasa Casmir
	Katosi Women Fishing &Devt Association	Box 33929 Kampala	Margaret Nakato
	Life Ministry Uganda	695 Kampala	National Director
Masaka	Kitenga Development Foundation	1987 Masaka	Godfrey Mwanje
Mpigi	Cbhc Community Based Health Care Organsiation	111 Mpigi	Director Mpigi H/C
	Dutch Ubanda Orphans Project	214 Mpigi	Nassolo Barbara
	Eldery Welfare Mission	25996 Mpigi	Sarah Busulwa
	Gomba Aids Support And Counselling Organisation	Box1204 Kanoni	Grace Kizito
	Kibibi Women's Assoc	1400 Mpigi	Katende Faridah
	Mpigi District Disabled Union	161 Mpingi	Sophia Lubega
	Mpingof	172 Mpigi	
	Nkozi Aids Project	188 Buwama	Kasibante N. Rehema
	Nkozi Aids Project	501 Nabusanke	Kasibante
	Omega Women's Group	694 Entebbe	Nakimuli Edith
	Uganda Red Cross Society	70 Mpigi	Joy Kiwanuka
	Upma/Mpigi Branch	Box 157 Mpigi	Olivia Kasolo
	Waggumbulizi Foundation	Box 174 Mpigi	Lumu Joseph
Mubende	Agali Awamu Members Group	117 Mityana	Kalanzi Charles
	Akwata Empola Namago Womens Group	Namagogo Lc1	Lubwama Edith
	Balibaseka	165 Mityana	Namuddu
	Balikyewunya Development Organsiation	132 Mityana	Kiyagga Harriet
	Barandiza Kimeze Youth Group	165 Mityana	Kalyesubula Bruluho
	Biva Muntuyo	40 Bulera	Nabulya Juliet
	Bukoooba Agali Awamu Group	43 Mityana	Kiberu Ernest
	Bukuya Twekembe Group	820 Bukuya	Sserugooti Daniel
	Bulera Vanila Spices And Horticultural	40 Bulera	Chrizestom Ssebuuma

District	Name Of Organization	Postal Address	Contact Person
	Butoloogo Rural Development Association	132 Mubende	Musaazi Richard
	Ezra Kibuuka Foundation	24 Kasanda	Kikome Sarah
	Kabbo Women's Association	391 Mityana	Ntabaazi Lucy Manager
	Kasaazi P.W.D. Group	24 Kassanda	Majwala Jamil
	Kasalaga Women Group	267 Mityana	Nakabaale Samuel
	Kassanda Cornerstone Foundation	33049 Kampala	Kezimbira Miyingo S. Publicity Sec.
	Kibaale Development	Bulera Subcounty	Kawonawo David Yiga
	Kisekende Womens Group	19 Kisekende	Kastigazi Beatrice
	Kiteredde Womens Group	Kakindu	Hasifa Kaliba
	Kiwamirembe Bwavu Mpologoma Farmers' Association	43 Mtn	Kiggundu Yesse Muddu-Awulira Chairman
	Kolping House Mityana Womens' Project	67 Mityana	Margret Kawooya Coordinator
	Konoweka W.G	24 Kasanda	Binywera Thomas
	Kyosimba Onanya		Nasani Kasilivu Malwa Kakindu
	Link Rural Based Organsation	253 Mityana	Muyingo Andrew -Coordinator
	Mityana		
	Mityana Orphans Primary Vocational School		Margret Sserunkuma
	Mitytana Foundation Of Disadvantaged Groups	310 Mityana	Busaggwa D.Y. Gabriel
	Mubende District Farmers Association (Mudfa)	264 Mityana	Peterson Nnyombi
	Mubende District Forum	94 Mubende	Margret Kawooya
	Nabingoola Ddembe Womens Group	44	Margaret Iga
	Nawou Mubende Branch	386 Mityana	Victoria Lwanga Lukwago
	Obwavu Ngo Nakiragala United Organsation	85 Mityana	Rev. S. Kaziiro Busunju Parish
	Rural Education Development & Child Welfare Scheme	142 Mityana	Pastor J. Makumbi
	Setuka Foundation (Sefo)	179 Mityana	Ntabaazi Frank Coordinator
	Sserinya Blick Makers	373 Mityana	Nabunjo Zaamu
	Uganda Change Agent Association Kiyuni Branch	1 Mubende	Kibuuka Francis Amooti
	Zigoti Women Group	267 Mtn	Vicky Muguluma
Mukono	Aids Action Uganda	Box 450 Mukono	Francis Xav Okwayi
	Cape Of Good Hope Orphan Care & Family Support Project	Box 133 Kampala	Kabeera Ntale
	Christ The King Bulumagi	Box 435 Jinja	Christ The King Bulumagi
	Literacy Aid Uganda	Box 1947 Kla	Irene Mondo
	Mukono Gatsby Club	Box 504 Mukono	Musanje James
	Mukono Harmonious Group	Box 397 Mukono	Lwanga Musuuza
	Mukono Multi Purpose You\Th Organisation	Box 7838 Kla	Byansi Lawrence
	Mukono Womens Aids Task Force (Mwatf)	Box 1	Namulondo Sarah
	Pat The Child	Box 85, Nkokonjeru	Zziwa Livingstone
	Uganda Environmental Education Foundation (Ueef)	Box 5658 Kampala	Senyonjo Nicholas

District	Name Of Organization	Postal Address	Contact Person
	Youth Alert Mukono	Box 531 Mukono	Ssentongo Mambule
Rakai	African Network For Prevention & Protection Against Child Abuse & Neglect (Anppcan- Rakai)	28991 Kampala	Nuwoha Ignatius All
	Community Welfare Services	85 Kaliisizo	Mubiru Joseph
	Concern Rakai	1644 Masaka	Project Manager
	International Care & Relief	252 Kyotera	Florence Muhangi
	Kakuuto Rural Development Foundation	143 Kyotera	Kalemba Christopher
	Kauurito Community Development Developmet Project	218 Kyotera	Mulumba Mathias
	Medecins Du Monde	170 Kyotera	Frank Lule Ssalongo
	Orphans Community Based Organisation	96 Kyotera	John Kalungi Ggayi
	Rakai Tourism Development Association	120 Kyotera	Nannono Angella
	Rural Development Services	1599 Masaka	Mutajjululwa Joseph
	Uganda Redcross Rakai Branch	195 Kyotera	Mulumba Mathias
	World Vision Uganda	123 Kyotera	Mwesigwa Daudi
Ssembabule	Co-Care Uganda	2635 Kampala	Ken Bricker
	Financial Services Association International Uganda Limited	6897 Kampala	Regional Supervisor- Masaka - Sembabule
	Mawoda Mawogola Womens Development Association	897masaka	Mary Bukenya
	Mawogola Movement Association For Development	Mateete Ssembabule	Mugenyi George
	Minnesota International Healthg Volunteers	Box 897	Mary Ssewamuwe
	Paralegal Ssembabule District	4020 Ssembabule	Kibira Deo
	Ssembabule Aids Counselling Services	897 Masaka	Buyoga V. Fred
	Ssembabule District Administration	4020 Ssembabule	Musoke Twaha Ssalongo
	Ssembabule District Change Agent Association	897 Masaka	Mary Bukenya
	Ssembabule District Farmers Association	59 Ssembabule	District Coordination Chairman
	Ssembabule Paralegal Association	42 Town Council	Keishanyu Phoebe
	Uganda Change Agent Association	2922 Kampala	Stan Burkey
Wakiso	Agency For Integrated Rural Development (Afird)	Box 27193 Kampala	Dr. Nalule Sarah Kizito
	Children And Life Mission	Box 2050 Kampala	Kayondo Leonard
	Community Action For Development	28 Kawempe	Peter Mutyaba Musajjawaza
	Community Efforts For Integrated Development (Ceide)	Box 26011 Kampala	Nakanwagi Maria
	Compassionate Outreach To East African Mission-Uganda (Coteam-U)	Box 71704 Clock Tower Kampala	Rev. Kwagala. K. Henry Or Mr. Lugya Costa Kiyingi
	Hunger Free World Uganda	Box 31067 Kampala	Batte Fred Country Director
	Hunger Free World-Uganda	31067 Kampala	Batte Fred
	The Hunger Project- Uganda	Box 26393 Kampala	Country Director
	Uganda Red Cross Society Entebbe Branch	Box 502 Entebbe	Mr. Bawonga Godfrey Branch Field Officer
	Voluntary Action For Development	Box 22281 Kampala	Isaac Wamala Sembatya
Bugiri	Action for Community Development & Health Care	98 Bugiri	Tezikoma John

District	Name Of Organization	Postal Address	Contact Person
	Aids Free Generation Project	278 Bugiri	Gilbert Matabi
	Bugiri Focus Association	37 Bugiri	Maka Christopher
	Bukooli Initiative Development Association	Namuganza	Mugoya David
	Buwunga Development Association	218 Bugiri	Kagoda Anthony
	Caring For Orphans' Widows And The Elderly	37 Bugiri	Kunya Stephen
	Foundation For Community Empowerment		Basalirwa Samuel
	Great Exploits Christian Ministry	380 Bugiri	Mwandabi Fredrick
	Habitat For Humanity Bukooli Bugiri Affiliate	37 Bugiri	Sande George
	Hukeseho Lwangosia Women Group		Hajati Mariam Odwori
	Idudi Development Association	2019 Bugiri	Kyakulaga John
	Integrated Dev. Activities And Aids Concern	278 Bugiri	Rev. Jackson Muteeba
	Islamic Medical Association Of Uganda	39 Bugiri	Ekinaidhanga Isabirye Farouk
	Kind To The Women & Orphans Dev't Agency	374 Bugiri	Sawenja Beatrice
	Mirembe Womens Association	77 Bugiri	Enyogu Florence
	Naluwelule Community Based Development Assoc.	77 Bugiri T/C	Rehema N.
	National Community Of Women Living		Aida Balikalaba
	Organisation Rural Development	37 Bugiri	Mulijjo Joyce
	Poverty Action Fund	37 Bugiri	Igambi David
	Rural Microentreprise Credit Scheme	219 Bugiri	Barasa Mutende
	Sigulu Islands Women Development	37 Bugiri	Odwori Florence Association
	Tufungize Drama Group	Buwuni Trading Centre	Twaha Wandera
	Uganda Change Agent Association	13 Bugiri	Constance Nabwire Langoya
	Uganda Muslim Rural Development Assoc.	114 Bugiri	Walugendo K. Sulaiman
	Uganda National Chambers Of Commerce & Industry	40 Bugiri	Isiko Kalifan
	Uganda Nedagala Lyayo		Budhala Waibi
	Uganda Red Cross Soociety- Bugiri Sub-Branch	278 Bugiri	Bavunana George Willy
	Uganda Womens Enterpreneurs Assoc. Ltd	77 Bugiri	Nandejje Gorret
Busia	Africa Inland Church- Uganda	121 Busia	Wilson Waswa
	Busia Anti Aids Youth&Women Assoc.	352 Busia	Oundo
	Busia District Farmers Association		Kenyatta Patrick
	Busia Women Producers Association	462 Busia	Karen Nasubo
	Busime Rural Dev. Assoc.	130 Busia	Malowa Charles
	Buyengo C.C.P Project	154 Busia	Nekesa Margaret Administrator
	Compassion International	321 Busia	Project Director
	Friends Of Christ Revival Ministries	6 Busia	Oketcho John Francis
	Grace World Mission	193 Busia	Were Joseph
	Hope Case Foundation	364 Busia	Godson Were
	Human Rights And Paralegal Services	187 Busia	Mangeni Matthias
	Kamukamu Women Integrated Dev't Initiatives	199 Busia	Margaret Nabwire
	Kaptoyoy Integrated Farmers Assoc.	125 Kapchorwa	Mawa Aldrin

District	Name Of Organization	Postal Address	Contact Person
	Nubian Community Development Association Assoc.	387 Busia	Mwalimu Ismail Ramadan
	Olympafrica Youth Centre	363 Busia	Robert Wandera
	Partnership Evangelical Church International	63 Busia	Rev. Donato Obuya Obbo
	Pentacostal Association Of Jesus	399 Busia	Ron Ainea Wabwire
	U.S.C.G	164 Busia	Andrew Nyange
	World Gospel Mission Busia Cbhc	276 Busia	Connie Ojiambo
Iganga	Association For Integrated Community Development	373 Iganga	Nakaima Ruth
	Associationfor The Cooperation Between Tiliko And Uganda	255 Iganga	Kabaale Fred
	Bakuseka Majja Womens Farmers Dev. Assoc.	403 Iganga	Bakaira Grace
	Bukaire Magezi Assoc.		Nabirye Betty
	Centre For Evangelism	39 Iganga	Pastor Paul R. Lubaale
	Charismatic Episcopial Church (U) Iganga	646 Iganga	Rev.Can. Timothy Kisa Wanume
	E4h Farmers Association	191 Iganga	Yasini Kirunda
	Foundation For Kigulu South Development Association	165 Kawera	Monica Mukyala
	Iam Not Alone Girl Child	RDCS or CAOS Office Iganga Admin	Hon. Beatrice Zilaba Muzaale Magoola
	Idudi Development Association Idda	2019 Busesa	John Kyakulaga
	Iganga District Credit & Saving Society	1101 Jinja	Kiwanuka Ruth
	Iganga District Elders Development Association	246 Iganga	Kipala Tenywa Jeffery
	Iganga District Farmers Association	632 Iganga	Lufafa Charles
	Iganga Muslim Youth Org	72 Iganga	District Kadhi Iganga
	Iganga United Development Association	118 Iganga	John Stephen Kakaire
	Integrated Development Activities & Aids Concern	461 Iganga	Rev. Jackson Muteeba
	Kigulu Development Group	619 Iganga	Mulondo Elia
	Musingi Rural Development Association	315 Iganga	Bazira Michael
	National Women Association For Social Education Advancement	519 Iganga	Anne Basalirwa
	Ngangali Agali Awamu Women's Group	23 Iganga	Naikoba Zabina
	Rdc's Office	358 Iganga	R.D.C
	Rural & Urban Development Foundation	191 Iganga	Yasin Kauta
	Tweyambe Womens Cub	Main Street Plot 108	Margrete Tagoole
	Uganda Biogass Development	2099 Busesa	Hon. Bagodha Moses Kyeyago
	Wider Opportunities For Women And Youth Association	358 Iganga	Ojambo Stanslause
Jinja	Action On Aids And Development Foundation	697 Jinja	Mpanga David
	Anppcn	1962	Jimmy Obbo
	Arise Africa International	1 Jinja	Geogfrey Wanamista
	Bandera Community Project	28 Kamuli	Balwana Geofrey
	Bandera Community Project	28 Kamuli	Balwana Godfrey
	Beat Art And Crafts	1834	Kigwana Jean
	Busoga Trust Water And Sanitation Sector	1993 Jinja	Johnson Waibi

District	Name Of Organization	Postal Address	Contact Person
	Butembe Development Agency	1669 Jinja	Ogutu George
	Child Restoration Outreach	2179 Jinja	Project Manager
	Church Of The Nazarene	376 Jinja	Rev.Menya
	Ecov (U) Chapter	720jinja	Chairperson
	First African Bicycle Information Orgfanisation And Workshop Fabio	1537 Jinja	Kayemba Patrick
	Jija Boda Operaation Development Assoc	1573 Jinja	Bakumpire Muhamed
	Jinja Child Development Centre	950 Jinja	Pastor Nile Baptist Church
	Jinja District Ngo Network	Kayemba Patrick	
	Jinja Municipality Women's Association	720 Jinja	Justine Kasolo
	Lutheran Church Mission In Uganda	290 Jinja	Henry Balidawwa
	Mamajane Children Care Centre	1185 Jinja	Matron
	National Assoc Of Women Organisation	1486	Louis Kabula
	Red Shining Performers	1769 Jinja	William Kayiwa
	School Drop Out Women And Disabled	1940 Jinja	Nairuba Susan
	Uganda Change Agent Assoc	5071	Isiko Richard
	Uganda Church Women Development Centre	1130 Jinja	Aggnes Birabwa
	Uganda Red Cross	1769 Jinja	Bfc
Bushenyi	Association For The Advancement Of Sustainable Rural Development	Box 386	Ahimbisibwe Blaaise
	Bushenyi Banana And Plantain Farmers Association	Box 317	Executive Secretary
	Bushenyi Beekeepers Assocition	Box 147 Kabwohe	Ben Assimwe
	Bushenyi Community Development Agency	Box 399 Bushenyi	Mugizi Pison
	Bushenyi Disabled Persons Association	Box 63 Bushenyi	Mr.Baigana Francis
	Bushenyi Women In Development Association		Lydia Ruranishaya
	Community Initiatives Development Association	Box 1139	Mugisha John
	Ebenezer Women Group	Box 1	Faith Amanya
	Family Planning Associationof Uganda	Box 144 Bushenyi	Kyarimpa Annet
	Hand In Hand Group	Box 1, Bushenyi	Mr. Muhumuza Aedo
	Integrated Community Based Initiatives	Box 16331 Kampala/Box 347 Bushenyi	Dr.Elioda/Mwebaza Noel
	Ishaka Bakyara Twendezane		Mrs Euas Tumarwe
	Kataagu Bakyara Twimukye Group	Box 233	Grace Katembe
	Kibaare Ant Aids Initiative Group		Tayebwa Alfred
	Kitabi Parish Catechechists Association		Begumya Matia
	Kyeizooba Community Based Health Workers	Box 117	Katooro Elly
	National Adult Education Association	Box 1157	Biryabarema B.Veneranda
	Nyaburare Pearl Group	Box 1, Bushenyi	Mrs Bucureezi Priver Tugume
	Nyanga Kwentungura Group	Box 1	Mr. Mayanja Cda Kyamuhunga
	Trust For Community Empowerment(Truce)	Box 329	Kenyangi Joan

District	Name Of Organization	Postal Address	Contact Person
	Uweso Bushenyi Branch	Box1185 Bushenyi	Mununguu Sophia
	Wakame Drama Actors		Mwebesa Moses Rugunda
Kiboga	African Evangelistic Enterprise	74 Kiboga	Ms Roselinda Oyuu
	Kiboga Aids Awareness And Support Organisation	1 Kiboga	Kalanda Isma
	Kiboga Integrated Development Association	63 Kiboga	Kitone Joseph
	Kiboga Integrated Development Initiative	80 Kiboga	Misigi Robert
	Kiboga Youth Drop In Centre	1 Kiboga	Bonyoko Ibrahim
	Masodde Project C.C.F	160 Kiboga	Mugula Derius/ J.B. Azalwa
	Uganda Chang Agent Kiboga District	146 Kiboga	Serute Kamya
	Wattuba Youth Development Association		Kaweke Jackson
Mbarara	Acord		Katushabe Mary
	Agency For Intergrated Development Training Services	208mbarara	Willy Nkamuheebwa
	Conservation Effort Community Development	238 Mbarara	Robert Isingoma
	Foundation For Aids Orphaned Children	1378mbarara	Boaz Buyinza
	Insingiro Family Promotion And Improvement Assoc	635mbarara	Kabakyenga Clare
	Kakiika Women's Group	1140 Mbarara	Jovia Matsiko
	Mbarara District Women's Development Assoc	152 Mbarara	Jolly Mugisha
	Rural Agricultureal Services Support Assoc	1975 Mbarara	Enock Nsimeki
	St Francis Family Helper Program	869 Mbarara	Tumuhaise Jennifer
	Tukore Invalid Salvation Association	1246 Mbarara	Matayo Mbogo
	Uganda Resources Management Foundation	11186 Kampala	Patrick Tumwine
	Uganda Womens' Effort To Save Orphans	1564 Mbarara	Nshana Ian
Ntungamo	Abateganda G.C	Abateganda Ntungamo T/C	Muburima J
	Bakayara Kwebeisaho Group - Feed The Children	Box 2 Bwashamaire	Baryahabwe
	Fukui -Uganda Friendship Association	Box 201	Nkusi Godfrey
	Kabeezi Youth Farmers Group		Dick Mwebaze
	Kabungo Womens Group		Arinaitwe Diana
	Kiyenje Diary Cooperative Heifer Project	Box 79 Rwashamaire	Tinkamanyire James
	Kyanju Tukore Mixed Group	Box 190 Ntungamo	Kyamarungi Johnson
	Kyempene Bakyara Twentungure	Box Rubaare-Ntungamo	Katto Christine
	National Strategy For The Advancement Of Rural Women Of Uganda (Nsarwu)	Box 137 Ntungamo	Kyomugisha Joy
	Ntungamo Rural And Urban Foundaton	Box 180 Ntungamo	Mbeetega Ben
	Ntungamo District Farmers Association	Box 19 Ntungamo	Dr. Katebarirwe Chris
	Ntungamo District Ngos/Cbos Forum	Box 219 Ntungamo	Katusiime David
	Nyakabare Bakyara Tutungukye	Rwoho T/C	Tashrekwa Jesca

District	Name Of Organization	Postal Address	Contact Person
	Rushooka Orphans Education Centre	Box 162 Ntungamo	Mbabazi Rebecca
	Rushooka Orphans Education Centre	Box 162 Ntungamo	Rutagonya Vincent
	Rushooka Women Group	Box 162	Rutagonya Dorah
	Rwoho Rural Development Associates	Box 17	Amanyire Deo
	Western Microfinance Association	Box I98 Ntungamo	Mugisha John
	Western Microfinance Association	Box I98 Ntungamo	Mugisha John

ANNEX 6: PERSONS MET

	Name	Institution	Function
1.	Basula Isabirye	Zoology Department MUK	LVEMP Coordinator
2.	Mugerwa	*EAC, Ministry of Foreign Affairs*	
3.	Kanyesigye F.	*NWSC*	LVEMP Coordinator/Quality Manager
4.	Boaz Kazeire	Fisheries Department Entebbe, MAAIF	
5.	Omar Wadda	*Water Hyacinth Control Unit, MAAIF*	LVEMP Coordinator
6.	Lukunya Edward	*Water Hyacinth Control Unit, MAAIF*	Senior Fisheries Officer
7.	Samuel A.A. Amule	MoLG	Assistant Commissioner
8.	John S. Balirwa	FIRRI	Director
9.	Senfuma	Water Resources Management Department	Commissioner
10.	Joel Okonga	*Water Resources Management Department, MWE*	National Focal Point, LVEMP
11.	Percy Washeba	MFPED	
12.	Mr. Tuhumwire J.T	*Department of Geological Survey and Mines*	Commissioner
13.	Jonna Kamanyi	Fisheries Department, MAAIF	Fish Stocks Assessment
14.	Dr. Levi Muhoozi	Fisheries Department, MAAIF	IFMP Coordinator
15.	Dick Nyeko	Fisheries Department, MAAIF	Commissioner
16.	Fred. M. Wanda	FIRRI/NARS	Researcher/LVEMP Coordinator
17.	Justin Ecaat	United Nations Development Programme	Environment Specialist
18.	Tom Wako Baguma	*Nile Basin Initiative*	Program Officer
19.	Onyango Gersom	*Forestry Inspection Division, MWE*	Assistant Commissioner
20.	Ssanya Patrick	*Ministry of Works, Transport and Communication*	Commissioner
21.	Kapalaga Isaac	*National Forestry Authority*	Ag. Executive Director
22.	**Mr. Mafabi Paul**	*Wetlands Inspection Division*	**Assistant Commissioner**
23.	**Bart Hilhorst**	*Information Products, FAO – Nile Basin*	Chief Technical Adviser
24.	**Mr. Bidasala Igaga**	*Ministry of Energy and Mineral Development*	Principal Energy Officer
25.	Mukobe Isaac	FIRRI/NARS	Training/ Outreach Officer
26.	Magumba Moses	FIRRI/NARS	Chief Technician
27.	Wandera S.B	FIRRI/NARS	Fish Biology (Mukene)
28.	Stephen Sekilanda	FIRRI/NARS	GLS and Environmental Stocks
29.	Lucas Ndaula	FIRRI/NARS	Water Environment, Aquatic invertebrates
30.	Odongkara Konstantine	FIRRI/NARS	Researcher
31.	Namulemo Gertrude	FIRRI/NARS	Researcher