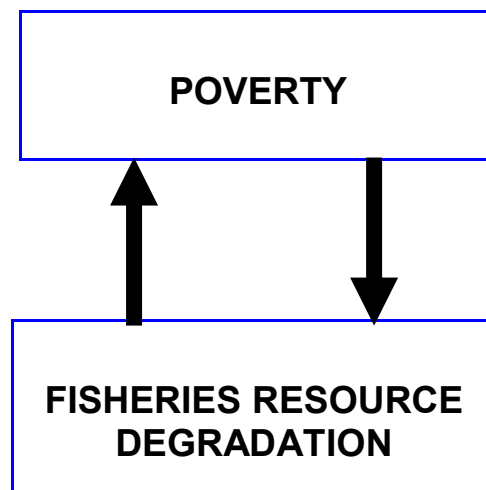


SOCIO-ECONOMIC RESEARCH REPORT 2

LAKE VICTORIA ENVIRONMENTAL MANAGEMENT PROJECT

**POVERTY IN THE FISHERIES:  
INDICATORS, CAUSES AND INTERVENTIONS**



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## **Preface**

The Lake Victoria Environment Management Project (LVEMP) is a regional multi-sectoral, multi-disciplinary project funded by the riparian Governments of Uganda, Kenya and Tanzania with a grant/loan from GEF/World Bank. It is a five-year project originally scheduled to end in June 2002.

The Socio-economic Sub-component of the project seeks to generate data that would be used to formulate policies governing management and utilisation of Lake Victoria resources with greater community participation in formulation and implementation, so as to enable them maximise benefits from the fishery.

This is the report of a research study aimed at developing an understanding of poverty and formulating a framework for intervention towards its alleviation for application in enhancement of the quality of life of Uganda's fishing communities of Lake Victoria.

The research reports are intended to disseminate the findings of the studies carried out under the Socio-economics Sub-component of LVEMP to a wide spectrum of users, including policy makers, stakeholders and researchers.

Any comments on the report would be most welcome.

## EXECUTIVE SUMMARY

The study is prompted by the poverty that has persisted among the fishing communities of Lake Victoria at a time of considerable cash inflow into the fisheries from the development of the fish processing industry. There has been need for an understanding of the poverty and what strategies would be most appropriate for its reduction. This study has attempted to respond to the need by identifying the nature and distribution of the poverty within the fisheries of Lake Victoria, Uganda, the factors responsible for it and the options for poverty reduction intervention.

The study examined the global and regional perspectives of poverty and wealth distribution, noting that wide disparities existed between the developed and the developing world and also between the developing countries themselves. A historical review of development policies and strategies revealed that while successive strategies were able to contribute to growth, their achievement towards poverty alleviation were less than satisfactory, hence the need for continually developing new strategies.

A background to Uganda's society and economy is provided, examining the demographic, political, environmental and economic conditions of the country. Uganda's development strategies are reviewed, highlighting the role of the Poverty Eradication Action Plan, Uganda's main strategy for implementing the policy of poverty reduction and wealth distribution. At the agricultural sector level, the Plan for the Modernisation of Agriculture has been formulated, followed by the National Fisheries Policy, aimed at providing a policy framework for the management and development of the fisheries.

An appropriate definition of poverty was formulated, considered relevant to the situation of Lake Victoria. The dimensions of poverty included inadequate basic necessities, low education and health achievements, a sense of insecurity and exposure to risk. The research methodology was enhanced by the examination of the Lélé Model of the Poverty–Environmental Degradation problem, the World Bank Model of Poverty Causation and the subsequent Lake Victoria Model developed in this study. It has provided a plan for the research, the consideration of criteria and a data collection plan. The data collection instruments included secondary data search, key informant interviews and a sample survey based on a structured questionnaire.

The study identified all the four dimensions of poverty in the fisheries, provided poverty profiles with respect to the different activities, groups of people and regions in the fisheries, based on consumption poverty. Among the people identified to be in poverty were the fishing labourers, fishers of *O. niloticus* and those operating with non-powered boats. In the post-harvest fisheries, large proportions of processors involved in salting and sun-drying, market stall and bicycle traders were in the poverty category. The ethnic groups most affected included the Samia, Basoga and Bakenye while the Districts of Jinja, Bugiri and Busia had the highest proportions of fishers in the poverty category. With respect to the other dimensions of poverty, the study showed that educational achievement was low within the fishing communities. The health status was poor, due mainly to the prevalence of malaria, diarrhoea, bilharzia and HIV/AIDS. There was a sense of insecurity within certain sections of the fishing community, due to leadership weaknesses within the local as well as the Government institutions. Some community members operated in a state of risk because they were vulnerable to episodes of income, health and education.

The causes of poverty in fisheries included weaknesses within the institutional and social environment, limitations in the technology available to the poor, resource degradation and unfavourable economic factors. The recommendations of the study for poverty reduction included strengthening of policies, developing links, improving capacities and increasing resources, to be applied at the levels of Central Government, Local Government and of the community.

In view of the achievements of the methodology used on this study, involving reference to the models, it is recommended that future research should build upon this model approach, as it will continue to produce results, especially when attempting to forecast changes relating to interventions.

## **Acknowledgements**

The author would like to express gratitude to FIRRI for providing the necessary facilities and environment for the research. Lake Victoria Environmental Management Project provided the funds, without which this research would have been impossible.

Special thanks go to the Socio-economics staff of FIRRI who participated in data collection and entry, namely Simon Kato, Mercy Kyangwa, Agnes Nasuuna, Ivan Kyangwa, Joseph Gongga, Alice Atai, Anne Nyapendi and Henry Ochaya. Joyce Nakimbugwe assisted with secretarial work.

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Special tribute goes to the people who provided the information, namely the fishers, fish processors and traders who patiently responded to the questionnaire. Thanks to the 'Gabungas', Heads of LMCs and the District Fisheries Staff for their co-operation during the research.

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## Acronyms

ADB	African Development Bank
AFRP	Artisanal Fisheries Rehabilitation Project
ARTP	Agricultural Research and Training Project
CBO	Community-Based Organisations
CERUDEB	Centenary Rural Development Bank
CIFA	Committee on Inland Fisheries of Africa
COMESA	Common Market for Eastern and Southern Africa
DANIDA	Danish International Development Agency
DFID	Department for International Development
EAC	East African Co-operation
EPRC	Economic Policy Research Centre
EU	European Union
FAO	Food and Agriculture Organisation
FCSEP	Fish Commodity Systems Economics (Uganda) Project
FIRRI	Fisheries Resources Research Institute
FOE	Friends of the Earth
FOSRI	Food Science Research Institute
GEF	Global Environmental Facility
HACCP	Hazard Analysis of Critical Control Points
ICRC	Integrated Consultancies and Resource Centre (Pty) Ltd
IDA	International Development Association
IDRC	International Development Research Center
IUCN	International Union for the conservation of Nature
JICA	Japanese International Development Agency
KfW	Kredietanstalt fiir Wiederanfbau
LMC	Landing Management Committee
LVEMP	Lake Victoria Environmental Management Project
LVFRP	Lake Victoria Fisheries Research Project
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MES	Ministry of Education and Sports
MFI	Micro-Finance Institutions
MFPEd	Ministry of Finance, Planning and Economic Development
MH	Ministry of Health
MWHC	Ministry of Works, Housing and Communication

NARO	National Agricultural Research Organisation
NEAP	National Environmental Action Plan
NEMA	National Environment Management authority
NGO	Non-Governmental Organisation
NORAD	Norwegian Agency for Development Co-operation
OAU	Organisation for African Unity
PEAP	Poverty Eradication Action Plan
PERD	Public Enterprise Reform and Divestiture Programme
PMA	Plan for the Modernisation of Agriculture
SAP	Structural Adjustment Programme
SD	Sustainable Development
SEDAWOG	Socio-economic Data Working Group
SIDA	Swedish Development Association
SWOT	Strengths, Weaknesses, Opportunities and Threats
UBOS	Uganda Bureau of Statistics
UCB	Uganda Commercial Bank
UIA	Uganda Investment Authority
UK	United Kingdom
UNBS	Uganda National Bureau of Standards
UNDP	United Nations Development Programme
UPE	Universal Primary Education
UPPAP	Uganda Participatory Poverty Assessment Process
USAID	United States Agency for International Development
UShs	Uganda Shillings
UWA	Uganda Wildlife Authority
WHO	World Health Organisation
WPTPA	Workshop on Political Theory and Policy Analysis
WTO	World Trade Organisation

## **POVERTY IN THE FISHERIES: INDICATORS, CAUSES AND INTERVENTIONS**

### 1. INTRODUCTION

The study has been prompted by the persistent apparent poverty among the fishing communities of Lake Victoria at a time of considerable cash inflow into the fisheries from the development of the fish processing industry for export. There has been need for an understanding of the poverty and the strategies most appropriate for its reduction. This study has attempted to respond to the need by identifying the nature and distribution of the poverty within the fisheries of Lake Victoria, Uganda, the factors responsible for it and the options for poverty reduction intervention.

The problem of poverty is global, with some 1.3 billion or nearly a quarter of the world's population characterised as poor, living on incomes of less than \$1 a day (UNDP 1997). Some 800 million of them are hungry or malnourished (DFID 1997). Most of the poor have limited access to information, to productive assets or to the market. An estimated 150-million primary-age children either do not go to school or get inadequate education. Over 900 million adults are illiterate. About 766 million people lack access to health services and their children are at the risk of dying young from communicable diseases, accidents and injury. Many have no access to clean water. Gender disaggregation reveals that about 70% of the world's poor are women. Although poverty is a global problem, the vast majority of the poor are found in the continents of Asia, South America and Africa, with the Sub-Saharan region being the most affected. On average, 45 to 50 percent of the region's populations live below the poverty line, a much higher proportion than in any other region of the world except South Asia (World Bank 1990).

The international community began to show concern for global poverty following the end of the Second World War. The United Nations and the Bretton Woods Institutions were created as part of the framework to bring about a New World order, envisaging better political and economic relationships among the nations of the world. Poverty in the majority among the emerging nation-states was viewed as a matter of concern for the new relationships envisaged.

Promotion of growth, through emphasis on investment, was the strategy pursued that resulted in the progress achieved in the 1970s. However, as a result of inadequate resources, weak economic policies and fluctuations in international prices for inputs and primary products, the high growth could not be sustained in the 1980s and poverty increased among the developing countries (World Bank 1990).

The period that followed was characterised by reforming and restructuring of policies and institutions. Between 1987 and 1998, the East Asia and Pacific region, excluding China, performed best among the developing countries and their successes were attributed to good policies and large investments in education and health (World Bank 2001c). In the Sub-Saharan African countries poverty actually increased during the period mainly because of the slow growth in the 1990s, attributed to policy and resource constraints. Other factors included the effects of the growing debt burdens and the social effects of structural adjustment programmes;

Uganda's Lake Victoria has supported a growing fishing industry over the last decade, producing average annual catch of 120,000 tonnes, consisting mainly of *L.*

*niloticus*, *O. niloticus*, *R. argentea* and other minor species in that order of significance. In the 1990s, as a result of a package of economic policies, the sector experienced rapid growth of industrial processing of *L. niloticus* fillets mainly in response to the European Union export market opportunities, generating increased earnings in the industry (MFPED 1997). However, there has been a growing concern that despite the increased financial inflow into the fisheries for over a decade, fishers have remained among the poorest sections of the communities, threatened by malnutrition and disease and enduring low standards of living. This situation has persisted despite the recent projects implemented in the sector. The situation is aggravated by fears that the sustainability of the industry is threatened by various human and other causes. Several hitherto important species have disappeared, leading to a fishery constituted by only three main commercial species, namely the *L. niloticus*, *O. niloticus* and *R. argentea*. Quantities of fish landed have been declining over the years from 135,000 to 107,000 tonnes in 1993 and 1997 respectively, with juveniles constituting increasingly significant proportions of the catch (EPRC 1998).

Intervention measures to alleviate poverty have been developed, involving the programme, the sectoral as well as project approach. The sector approach is used to manage government's role in a sector as well as the aid to the sector. It involves putting in place a strategy which identifies the role of the state in relation to the private sector, both commercial and non-commercial. The sector approach was developed as an alternative approach to projects, in light of the shortcomings experienced with providing development assistance through projects alone. These included the difficulties for governments to manage the often large number of projects in a given sector; the danger of funding low priority activities and the failure of project benefits to be sustainable when fundamental problems existed within government and the broad policy environment (Ackroyd and Duncan 1998). At the project level, investments, policies, institutions and other actions are packaged for the purpose of achieving a specific development objective within a defined time period (Baum & Tolbert 1985). The main stages of the project cycle include the preparation stage, when the project ideas are spotted and screened. This is followed by project preparation involving a feasibility study and detailed planning. Appraisal is the third stage, which is undertaken by external agencies to assess the overall soundness of the project and readiness for implementation. The fourth stage is implementation, when actual development or construction of the project is undertaken. The final stage is evaluation on completion of project, to determine whether the project objectives have been achieved and to draw lessons from the experience with the project.

A useful tool that has been developed for project planning is the Logical Project Framework (NORAD 1996). It summarises in a tabular presentation statements of the project goal, objectives, activities with their corresponding monitorable indicators and assumptions. Apart from providing clarity to the project plan, its use ensures that important aspects are considered in the project planning process.

Projects can also be designed using the process approach (Ackroyd (1992). On such projects, the design and intermediate objectives exist only in outline, with many details to be determined in the implementation phase. Project planning is flexible; projects are designed so that options are left open until the relevant time for decision is reached. The process approach is relevant in projects for adaptive research, technology, extension and institutional development where innovation is involved and the speed and direction of change is unpredictable. Its main weakness is that it requires extensive planning and supervision by project staff, which may be expensive.

A number of projects have been implemented on Lake Victoria, Uganda, over the years and at present, there are two regional projects involving the Lake Victoria riparian states of Uganda, Kenya and Tanzania. The Lake Victoria Fisheries Research Project (LVFRP) is funded by the European Union and Government and seeks to contribute towards formulation of a management plan for Lake Victoria through provision of stocks related and socio-economic data. The Lake Victoria Environmental Management Project (LVEMP) is a Global Environmental Facility (GEF) and International Development Association (IDA)-funded project, with a Government contribution, aimed at the rehabilitation of the lake ecosystem through a wide range of components.

The research questions for the study related to what was the nature of the poverty among the fishing communities, what were the causes and how they could be addressed. The underlying hypothesis was that the effect of the market mechanism was to create activity centres within the fisheries and that poverty was linked to a number of the centres, caused by institutional, social, economic, resource and technological factors. The overall goal of the research was to contribute to the understanding of poverty and develop a framework for intervention towards alleviation of poverty that might be applied in the enhancement of the quality of life of Uganda's fishing communities of Lake Victoria.

The specific objectives were to:

- i. Establish the nature of poverty among the fishing communities of Lake Victoria, Uganda.
- ii. Identify the activities within the sector associated with poverty.
- iii. Determine the distribution of poverty within the different groups of people and districts on the lake.
- iv. Identify and analyse the causes of poverty within the groups and regions affected.
- v. Identify the necessary types of intervention for poverty reduction, through policies and programs and their appropriate points of application.
- vi. Assess Uganda's recent poverty reduction policies and programs at the national level and in the fields of agriculture, fisheries or environment for their relevance and effectiveness for poverty reduction in fisheries.

The study structure consists of an introductory section to the research, specifying the research problem, goal and objectives and introducing the different parts of the study. It also includes an analysis of the different interventions measures towards poverty alleviation. Section 2 sets the background to Uganda's society and economy, examining the social, environmental and economic status of the country. Uganda's development strategies are reviewed, highlighting the role of the Poverty Alleviation Action Plan (PEAP) as Uganda's main strategy for implementing the policy of poverty "eradication" and wealth distribution. At the agricultural sector level, the Plan for the Modernisation of Agriculture (PMA) has been formulated to operationalise PEAP. The section reviews the status of Uganda's fisheries, its strengths, weaknesses and threats and examines the draft National Fisheries Policy (NFP), for its relevance to poverty alleviation. In Section 3, a review of the literature is carried out. Aspects covered include the global and regional perspectives of poverty and a review of the early development theory and the subsequent strategies to

address it. The concept of sustainable development is examined, including ideas on how it could be achieved. The review then covers the nature, causes and measures of poverty and strategies for its alleviation, with an assessment of their relevance to the Lake Victoria fisheries poverty situation. In Section 4, the research methodologies are described. It begins with a model of the fish commodity system for Lake Victoria and proceeds to develop a conceptual framework of poverty causation in fisheries. This is illustrated with an appropriate model, to guide the research. It is followed by selection of appropriate variables for the research concepts, identification of sources of secondary and primary data, design of sampling scheme, the data instruments to be used, methods of analysis and display of data.

Section 5 presents and discusses the results and related findings on the nature and distribution of poverty in the fisheries. Sections 6 to 9 provide data on the causes of poverty, covering the institutional and social environment; the technological factor; the resource availability and the economic factor, also covering the market and financing aspects. Section 10 provides a summary of the findings of the research and the conclusions drawn from the research and the recommendations of the study.

## 2. BACKGROUND ON UGANDA

The key aspects of Uganda's society, environment and economy were examined with the view to providing the background information to the study of poverty in the fisheries. As a conclusion, the strengths and weaknesses that emerged at various points of the analysis were drawn and summarised as part of the output of the study. Uganda's landlocked position is a disadvantage with respect to external trade on which the country depends for its development needs. High transport costs to the sea lead to high cost of import of consumption goods as well as production inputs, with significant consequences for the poor.

There is a perception that Uganda is well endowed with valuable natural resources including arable land, good climate, vegetation and water resources, among others. However, these natural resources favour the production of typically low-valued primary products, or those with highly unstable world market prices. They include coffee, cotton, tea, maize, beans and fish. This has negative effect on growth and is a source of risk to the livelihood for the poor.

The country's population is its biggest asset for development. However, its growth rate average of 2.5% per annum is said to be too high for the available social facilities and the resources for their expansion. The productivity of the population is limited by its low health status, attributed to high incidences of malaria, respiratory infections and HIV/AIDS, among a variety of other ailments. Limited medical and public health facilities and services are reported. Consequently, there is also a direct cost of poor health, since some of the medical services have to be paid for.

The human capital of the population is limited by the low levels of education achieved. Limited access, high cost and irrelevant content of education have contributed to its low value. Bad politics and poor governance have characterised much of the Uganda's independence history. This did not only create poverty by discouraging investments into the country and by failing to provide the necessary social services but created a sense of insecurity and a state of risk among the people, all of which are dimensions of poverty. Lack of adequate resources and poor use of the resources that become available together with technological limitations continue to drive the economy down the poverty sink.

Despite the heavy dependence of the economy on natural resources, unsustainable practices characterise their exploitation, with greater tendencies towards poverty for the resource users and the nation as a whole. In the case of the fisheries, failure to manage the resource presents a threat to its vibrant industry. The roots of Uganda's poverty are, therefore, wide spread, ranging from its natural resources, the people, the Government and the resource and technology available.

Uganda's strengths are said to lie in the policies it has adopted. The environmental policies under NEAP would provide for resource sustainability in the process of development. Its success, however, will depend on a number of factors, including political will at all levels. The decentralisation policy and other social, political and legislative measures have been introduced to strengthen governance and provide the 'enabling environment' required for development. Various economic policies are in place, leading to the relevant programs of action and providing for their institutional, resource and technological requirements. The most important economic policy at this stage is poverty alleviation, implemented through PEAP, PMA and NFP. The success

of these programmes would reduce Uganda's poverty to a great extent. Among the opportunities for development is the goodwill Uganda enjoys among its development partners, which has not only led to continuous inflow of funds for over a decade now but has recently led to the inclusion of Uganda among the countries to benefit from the Heavily Indebted Poor Countries (HIPC) debt relief initiative. Uganda's main development partners include the World Bank, IDA, EU, DFID, USAID, ADB, DANIDA, JICA, KfW, SIDA, IDRC and NORAD, among others. However, effective utilisation of donor facilities still remains a challenge for the leadership of Uganda and despite the large inflow of resources, poverty has persisted, exacerbated by widespread corruption.

Uganda's water resource endowments support significant fisheries. The present fisheries resource base is comprised of artisanal capture fisheries and aquaculture. The major commercial species for the fisheries on the various water bodies include *Lates niloticus*, *Oreochromis niloticus*, *Rastrineobola argentea*, *Alestes baremose*, *Hydrocynus spp.*, *Clarias mossambicus*, *Bagrus docmac* and *Protopterus*. The potential production is estimated at 300,000 tonnes annually on sustainable basis but actual catch has been about 220,000 per year.

Over the last decade, the importance of the fisheries to Uganda has clearly come to light in the large *L. niloticus* catches landed, exchanged at sometimes quite high prices to generate incomes to the fishers concerned and filleted for the export market. Fish export data are presented in Table 1

Table 1: Export of Fish and Fish Products from Uganda, 1993-1999:

Year	1993	1994	1995	1996	1997	1998	1999
Quantity (Tonnes)	6,138	6,564	16,046	14,075	11,819	14,688	9,628
Value (US\$)	8,943	10,403	32,262	46,251	27,864	39,879	24,837

Source: UBOS 2000b

In addition to this significant economic performance, however, Uganda's fisheries would be important because of its potential to make direct contribution towards realisation of the country's policy of poverty alleviation. First, its high quality animal protein output is a contribution to the good health of local communities, at an affordable cost. Secondly the magnitude and distribution of the fisheries resources provide significant opportunities for livelihood activities, within technological reach of the local people. Fish is also said to have market, both locally, regionally and overseas, so fishers of different levels have a chance of tapping into the different markets of their reach. Measures are now in progress to put in place the National Fisheries Policy to ensure that the fisheries resources are regulated and consumers assured of quality and safety of fish and fishery products (MAAIF 2000).

### 3. LITERATURE REVIEW

A comprehensive literature review was done in the early stages of the study at the project identification and preparation stages and maintained throughout the research activities. The aim was to establish the knowledge base on the subject of development, wealth distribution and poverty. Sources of information included books, which were reviewed for basic principles in order to establish a firm theoretical foundation for the study. These were supplemented with journal articles, which presented supportive or critical viewpoints on these theories, based on the authors' research within different situations and at different times, often with some authors offering explanations with models of their own. Official publications of the Government of Uganda and of aid agencies were also reviewed, notably of the World Bank, European Union, DFID, USAID, DANIDA and GTZ to obtain an understanding of policies and strategies towards poverty from the perspectives of Government and of the development partners.

The literature search examined world development in the post Second World War period and the concerns for poverty within the newly emerging nation-states and early strategies put forward to deal with it. The development theory had been formulated for the guidance of the third world (Sen 1986). Its emphasis was on investment in physical capital and infrastructure and technology, with the state playing a central role in economic development. The literature explains that while some growth was achieved under the development theory, poverty deepened in many parts of the developing world. The expected 'trickle down' effect did not materialise (Piertese 2001, Soetjatmoko 1986, Wee and Heyzer 1995).

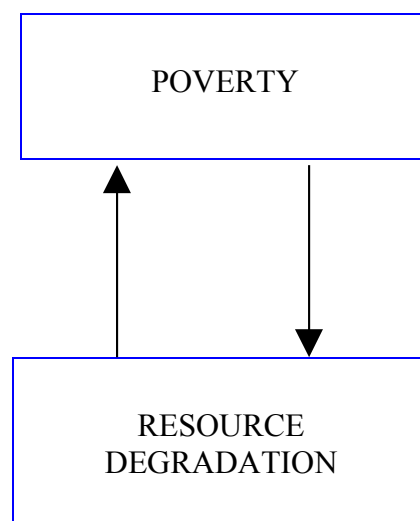
Subsequent development strategies were then reviewed. In the 1970s, the 'basic needs' strategy was formulated, focusing on direct provision of health, nutrition and education (World Bank 1990). These were considered important not only as ends in themselves but as means to promote growth in incomes. However, because of weaknesses in policy, the strategy was not able to bring about the desired changes, leading to introduction of the Structural Adjustment Programmes (SAP) of the 1980s (Wee and Heyzer 1995). Elements of the strategy included emphasis on the pattern of growth that made use greater use of labour, investing in human capital of the poor and restructuring the economy to become more free-market oriented. However, social impacts of implementing SIP were often experienced in different ways. They included the lowering of social services on which the poor depended; lowering of wages and commodity prices and creating income uncertainties due to currency fluctuations. As the 21<sup>st</sup> century began, structural adjustment would continue but programs have been proposed for increasing opportunity, facilitating empowerment and enhancing security of the poor (World Bank 2001c).

The literature revealed the global distribution of wealth, concluding it was "extraordinarily unequal," with the average income in the richest 20 countries being 37 times the average in the poorest 20 (World Bank 2001c). Among the regions of the third world, East Asia had been the most successful in reducing poverty, attributed to good policies, investment in social services and improvements in the region's terms of trade. Sub-Saharan region performed least, mainly due to inadequate growth. It is noted that due to the changing economic environment, economic growth was no longer driven by just investment but also by policies, institutions and external

interventions necessary for it to be sustained. Policies conducive to growth should, therefore, include openness to international trade; sound monetary and fiscal policies reflected in moderate budget deficits and the absence of high inflation; a well-developed financial system and a moderately sized government (World Bank 2001b p. 49). The entire world community has also set itself the International Development Goals, to be achieved by the year 2015. Although the IDGs are expressed in global terms, they should be implemented at the national level and this would encourage capacity building.

The concept of sustainable development (SD) was reviewed. Its origin was in the Bruntland Commission of 1987 and it is defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development 1987). The mainstream SD thinking identifies three elements of SD. First, environmental degradation is already a threat to human welfare and needs to be addressed. Secondly, the basic needs of people should be provided and the productivity of all resources increased. Thirdly, the process of development must be participatory. A two-way causation link was said to exist between poverty and environmental degradation, which could form the basis for policy (Barbier 1994, Lélé 1991).

Figure 1: Poverty and Environment Sustainable Development Theory



Source: Lélé 1991

However, later studies considered this an over-simplification of the reality and suggested relevant modifications (Lélé 1991). Access to resources, affluence, culture and values and technology were the additional factors re-enforcing the “two-way” causal interaction between poverty and environmental degradation, introduced in an attempt to provide the big picture within which poverty and environmental degradation were caused. Strategies to attain sustainability have been suggested. Drumond and Symes (1997) express the need to understand the causes of unsustainable tendencies in fisheries and recommend that policy must move beyond treating unsustainable practices and events as discrete occurrences to a situation where they are addressed as outcomes of economic and social processes and the

conditions in which they occur. The relevance of the model is seen in the behaviour on Lake Victoria, where fishers have been involved in migrations and modification of gear in response to limitations imposed by regulations. Sen and Nielsen (1996) describe the range of management regimes, from the 'instructive' model where Government is the dominant partner to the 'advisory' type where the user groups assume greater role than the state, which is reduced to offering management advice. Failures associated with the 'instructive' model on Lake Victoria have been discussed. Ostrom (1990) and Pinkerton (1989) suggest the conditions that must prevail for successful resource regulation under co-management. The conditions relate to appropriate institutional framework for governing common property resources and to organisation of the user groups for collective action. They include clearly defined boundaries; membership clearly defined; group cohesion; organisations existing; benefits exceed cost; participation by those affected; management rules enforced; local rights to organise; co-operation and leadership at community level; decentralisation and delegation of authority; and co-ordination between government and community. Some of these conditions exist on Lake Victoria to varying degrees while others would need to be created.

Finally, an understanding of relationships between individuals in a user-group over a resource is provided by WPTPA (1997), involving a triangle of strategic assets that influence these relationships. The assets include group size, where the smaller size works better; mode of communication, with preference for face - to - face contact; holding of shared norms, particularly if they are cultural; congruency of interests and resources and track record over time.

Development of the definition of poverty is well documented, with Alcock (1997) tracing it back to the work of Booth and Rowntree in England, which gave rise to the concept of a poverty line, initially defined as the minimum package of goods and services necessary for 'subsistence'. Townsend (1993) introduces the importance of the social needs of people, leading to extension of the definition to the 'basic needs'. The World Bank (1990) provides further extension of the poverty idea to a consumption-based poverty line to include "the expenditure necessary to buy a minimum standard of nutrition and other basic necessities and a further amount that varies from country to country, reflecting the cost of participating in the everyday life of society" (World Bank 1990 p. 26). New dimensions to the definition of poverty have continued to be added to include ownership and access to productive resources and assets; access to social services, notably health and education; sense of insecurity and exposure to risk (Chambers 1983, Dixon 1990, OXFAM 1996, World Bank 1999, 2001c).

In its conceptualisation of poverty, Uganda's PEAP identifies three levels of poverty, namely the individual, the household and community levels and at each level, different elements of poverty would feature more prominently. The main elements include low incomes that are insufficient to meet the basic needs of the poor, lack of sufficient food and poor nutrition among many people within the population, poor health resulting from common diseases and limited access to clean water.

The success of a poverty alleviation program requires development of suitable indicators for the different elements of poverty. This would allow the existence, nature and magnitude to be established and to monitor response to intervention. However, Weldnitzer (1996) notes the difficulties of identifying the indicators because many of them are also causes in the 'vicious cycle' of poverty. Lack of data,

particularly in developing countries, also makes some of the indicators less practicable. World Bank (2001c) identifies the relevant indicators to include material deprivation, arising from inadequate income available to the individual or household; low achievements in education and health, valued both in their own right and also as factors in material deprivation; exposure to risk as a result of being in a vulnerable situation and a sense of insecurity as a result of being voiceless and powerless in society.

World Bank (2001c) reports of the different methodologies developed to measure the different dimensions of poverty. Income poverty is measured based on household income and consumption surveys, which are also presently the most applied poverty measurement methodologies around the world (Ravallion 1992). A poverty line is established and used under this method, defined as the critical cut-off in income or consumption, below which a household or individual is said to be poor. Measurement of health utilises the main health indicators, namely infant and under-five mortality rates, derived from censuses, surveys and vital registration. Education is measured using the gross primary school enrolment rate. Vulnerability was explained to mean the experiencing of an episode of income, health or education poverty and the probability of being exposed to other risks such as violence, crime, natural disasters or being pulled out of school. These would be measured using “household panel data,” derived from surveys that follow the same households over several years. Indicators commonly used include household assets and alternative sources of income. Sense of insecurity would be measured using participatory surveys, polls and national surveys.

Different causes of poverty are reported in the literature. An extreme view, referred to as the ‘pathological model’ of poverty causation, or the ‘character deficiency’ cause of poverty, explains poverty in the weaknesses of the individuals themselves or their societies. One’s genetic and psychological factors are said to explain the individual’s non-achievement (Alcock 1997). For developing countries, the model attributes poverty to the nature of societies in these countries, where values and practices perpetuates ‘backwardness’. Idleness, drunkenness, gambling, unwise expenditure, incompetence, ignorance and even lack of intelligence are said to be responsible for the poverty of individuals, families and even communities (Townsend 1993). The ‘environmental’ school of thought sees poverty as arising from increasing shortages of resources, particularly as a result of population expansion. Poor environmental conditions and degradation are also viewed as major causes of poverty (Dixon 1990). The ‘political economy’ or the ‘structural factors’ school of thought views the processes that concentrate power and resources in a few hands as the root cause of poverty (Alcock 1997, Dixon 1990, Townsend 1993). Of particular concern is the emerging phenomenon of ‘feminisation of poverty’, a concept which refers to the greater risk and suffering of poverty among women than men as a result of gender roles in society and discrimination on the labour market. (Townsend 1993, Wee and Heyzer 1995). Finally, episodes are recognised for their roles as causes of poverty. They include wars, political upheavals and natural disasters which destroy peoples’ properties and sources of livelihood, affect their health and source of social services. World Bank (2001c) views the causes of the current poverty in lack of income and assets to attain basic necessities of life; a sense of voicelessness and powerlessness in the institutions of state and the vulnerability to adverse shocks and inability to deal with them.

#### 4. RESEARCH METHODOLOGIES AND ACTIVITIES

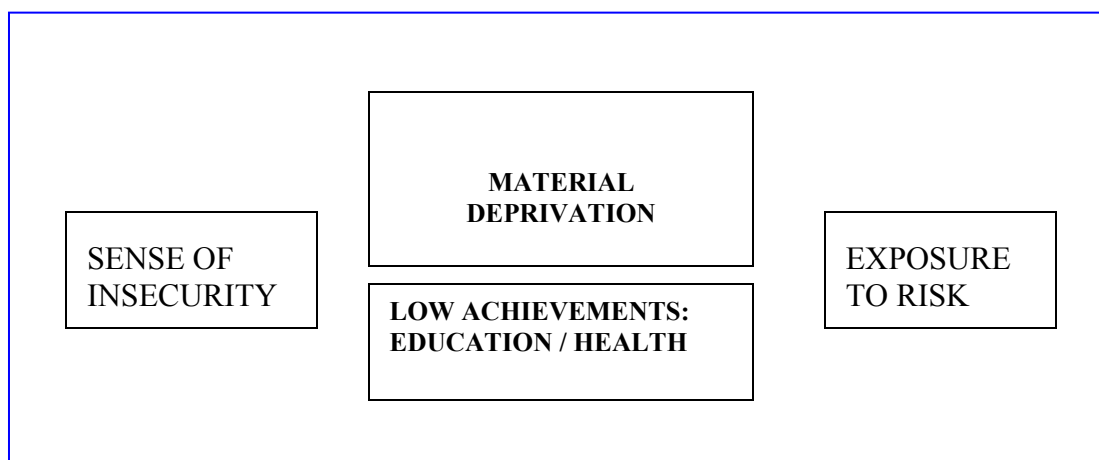
Methodologies for use in carrying out the research were developed. They included the literature review; conceptualisation of the fishery sector and of poverty causation within the communities on Lake Victoria; identification of relevant variables to reflect the concepts examined, data collection through the use of secondary and field data gathering instruments, analysis and presentation of the data.

The literature review, reported in Section 3, formed a part of the research activities. The aim was to establish the knowledge base on the subject of poverty, focusing on policies, issues and methodologies and draw lessons for research and development on of Lake Victoria. It examined trends in global and regional wealth distribution where it was noted that wide disparities existed between the developed and the developing world. There were also disparities among the developing regions themselves, with East Asia being among the best performing regions while Sub-Saharan Africa and South Asia achieving the least in poverty reduction by the end of the 1990s (World Bank 2001c). Inadequate growth and low investment in social services were responsible for performance in the poor regions, attributed to inadequate resources, policy constraints and inadequate investment in human capital. A historical review of development policies and strategies and their effects on poverty was carried out. It was noted that while successive strategies contributed towards growth, their achievement toward poverty alleviation were less satisfactory, hence the need for continually developing new strategies.

The concept of sustainable development was examined and suggestions to improve on the two-way relationship model involving poverty and resource degradation were reviewed. The additional factors suggested included access to resources, affluence, technology, culture and values (Lélé 1991). In managing of the natural resources, Drumond and Symes (1997) pointed out the need to target regulations at the causes of the unsustainable tendencies, rather than the symptoms. Ideas for shared roles between the state and user groups in resource management were presented by Sen and Nielsen (1996). Criteria for successful co-management of the resources were suggested by Ostrom (1990) and Pinkerton (1989). These theories were considered relevant in strengthening fisheries management on Lake Victoria.

The different dimensions of poverty were identified, namely inadequate consumption, lack of achievement in education and health, a sense of insecurity and a state of risk among the poor, as depicted in Figure 2. The causes put forward included lack of income and assets to attain basic necessities of life; various forms of bad governance and vulnerability of the poor to adverse shocks and their inability to deal with them. The strategies highlighted to address poverty included promoting opportunity, facilitating empowerment and enhancing security among the poor (World Bank 2001c).

Figure 2. Poverty: The Broad Definition



As part of the preparation of the research project, the fisheries of Lake Victoria were conceptualised. It was noted that there were relationships within the various activities and outside the fisheries. In order to analyse their effects, the concept of externalities was introduced, making distinction between inter and intra-industry externalities. The other important distinction was between real and market externalities, where the former affected the production and consumption levels of other units directly while the latter affected them through the market (Johnston 1992). Because of the interlinkages between activities within a natural resource, the need to develop an Aquatic Resource Management Plan (ARMP) was noted. An ARMP is a descriptive tool, prepared for a well defined geographical area, important for providing proper context, aiding priority setting and facilitating implementation of policy and legislation through the project cycle. It should be pointed out that the methodology for developing an ARMP should enable the needs and aspirations of all water users to be accommodated where possible and facilitate effective planning of development of the environmental resource. The ARMP is also useful in assessing whether the activities meet the set objectives.

The fish commodity system was conceptualised with the aid of a descriptive model, depicting four main flow channels for fish (Figure 3). The model has been used in the poverty study to identify the points where the different poverty factors operated, thus facilitating effective targeting by poverty alleviation interventions.

Moving down from the top, the model recognises that there are non-participants in the sector, consisting of people who do not in any way benefit from the fishery. These would include non-owners of fishing equipment, people involved in activities that do not directly or indirectly service the fishery and the unemployed. In this category, there would, in fact be those who suffer as a result of negative externalities from the fishery. An example of such externalities would be the high costs of food items at the landing sites resulting from the large numbers of fishers as well as the pecuniary externalities from the large daily cash transactions involving fish. Related to this group are other non-participants in the fishery but people who derive some external benefits from activities within the sector, due to some tenuous links to the fishery. These may be members of fishery households or relatives.

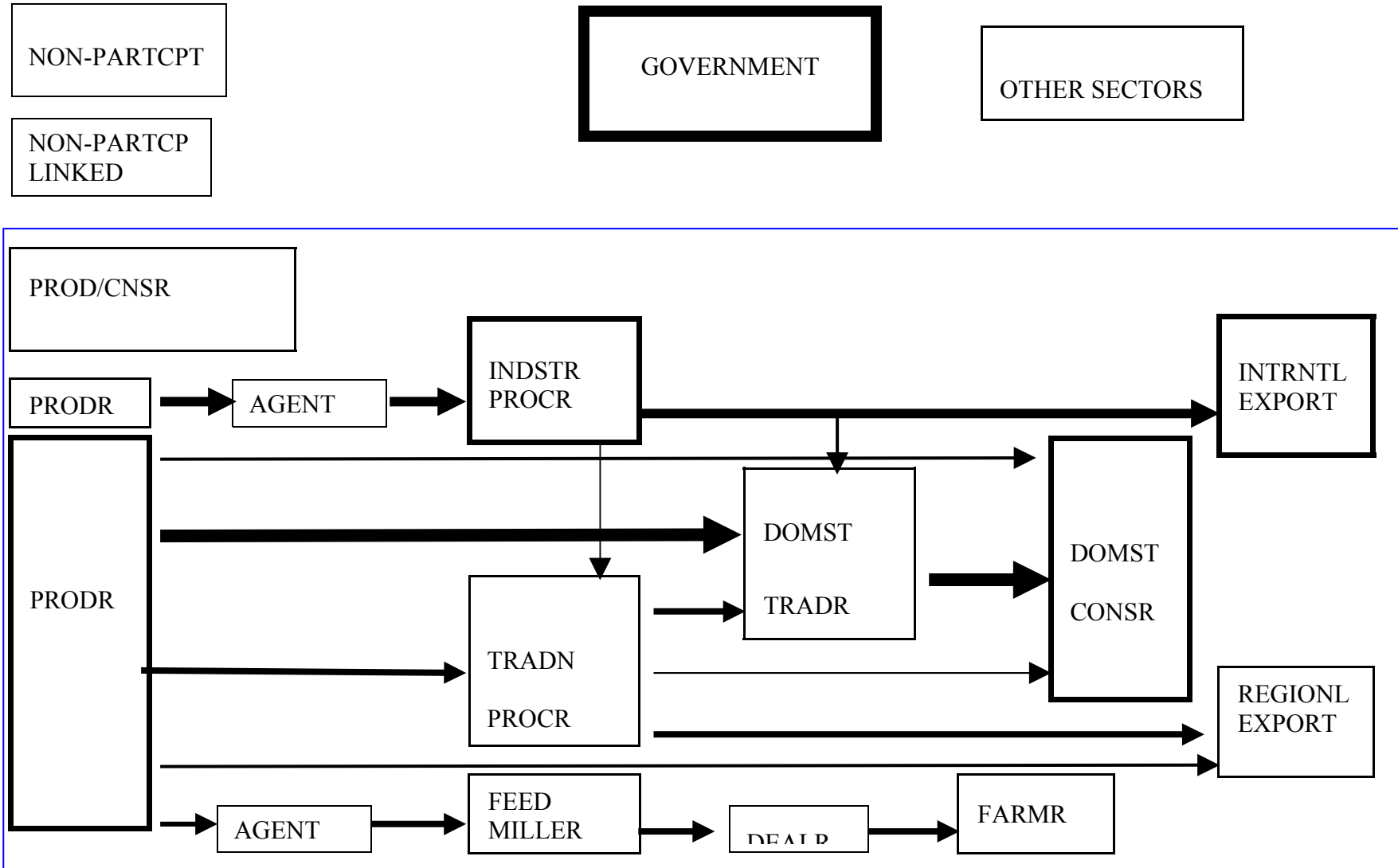
A small but significant group on Lake Victoria are the subsistence fishers. Although traditionally they were the most common group on the lake, the number reduced as more people took to fishing for income. These are among the poor people in the fisheries, utilising low levels and sometimes simple gear, such as traps, baskets and hand hooks. Their operations are often not boat-based. The capital requirements are negligible and much of the work depends on labour. Women play great role in this fishery. *O. niloticus*, *Clarias* and *Protopterus* are the species commonly targeted. The activities take place mainly in shallow waters and bays, often regarded as possible breeding and nursery grounds for fish. As a result breeding fish and juveniles form greater parts of their catch.

The second channel is that which serves the overseas export market. It involves larger scale operations than the rest, bigger capital investments, better organisation, higher quality products, better facilities and greater earnings. Within the channel, artisanal fishers supply fish to the industrial processing plants directly or through factory agents. Chilled fillets of *L. niloticus* as well as frozen fish are exported mainly to destinations in Europe, Asia and USA. The by-products, mainly fish frames and off-cuts, are sold on the domestic market. Despite the high earnings associated with the trade, it is regarded as being highly risky, because of the frequent fish ban on the EU market, due to food safety concerns and other factors over which Uganda has little control.

The largest channel is the domestic market for fish, in terms of employment and volumes of fish handled. It also supplies fish to the regional markets. The main species traded are *L. niloticus*, *O. niloticus* and *R. argentea* delivered fresh, smoked or sun-dried in the case of the latter. Because of the isolation of many of the fish landing sites, considerable traditional processing through smoking takes place within this system. The channel is also characterised by large quantities of juvenile fish landed, processed and traded. This is attributed to the low capital among the fishers, making them unable to afford the recommended types of gear. Furthermore, the high poverty among consumers on the domestic market means they can only afford small-sized fish. However, poor road infrastructure, non-use of ice, high cost of transportation and low purchasing power among consumers have seriously constrained the domestic fish market.

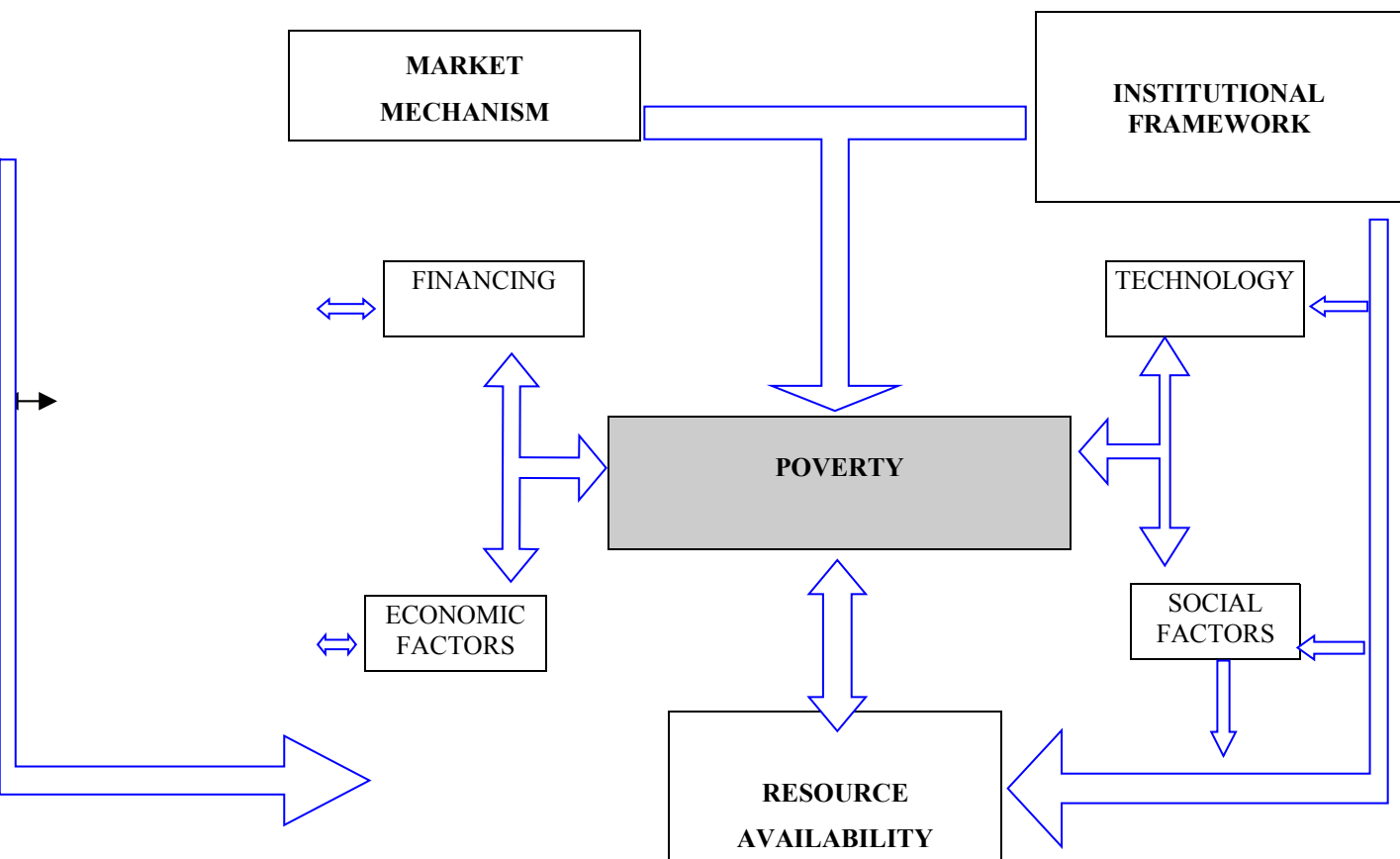
Finally, there is the channel that delivers *R. argentea* from producers to processing plants for fishmeal, an industry that has been growing of recent. Specialised fishing units harvest the fish, using the “lampara” net, designed specifically for scooping the fish after it has been attracted to a point in large concentration by light using pressure lamps. Agents bulk supplies of the dried fish from numerous small fishers, processors or traders and deliver to the feed mills. A few millers also buy direct, especially from the large fishers like those based at Lambu Landing Site in Masaka District. The product is supplied to farmers through appropriate agents and retailers. Apart from the nutrition concerns associated with diverting this resource from the local poor to the production of fishmeal, development in this fish commodity channel has provided a more lucrative and stable market to the fishers concerned and enhanced their earnings. It has also saved the nation foreign exchange hitherto spent on importing protein-rich feeds.

Figure 3: The Fish Commodity Systems Flow Diagram



A conceptual framework for poverty analysis on the research was developed as a descriptive tool that identifies the factors and relationships within the poverty situations (Figure 4). It draws on the strengths of the Lélé (1991) and the World Bank (2001c) models and builds upon them to provide a more relevant framework for Lake Victoria.

Figure 4. Poverty Factors in the Fisheries of Lake Victoria, Uganda



Among the poverty causing factors on the model is the institutional framework, which refers to the roles and responsibilities of government for economic policies, resource management, provision of services and good governance.

The market mechanism refers to both international and domestic trade influences. Globalisation and affluence could lead to higher earnings for the fish suppliers involved, create jobs within the trading channel and generate foreign exchange earnings for the country. However, they could also deprive the poor local consumers of access to fish due to the high fish prices created, eliminate artisanal processors and traders from their livelihood activities and threaten the sustainability of the resource by attracting excess effort.

Social factors considered important on the model include the local institutions that would facilitate community participation in resource management and implementation of development programs. The role of gender and culture in poverty are also reflected here.

The influence of technological constraints with respect to fisheries resource sustainability, cost of production, quality maintenance and distribution would be identified.

Financing as a factor refers to earnings, savings and credit as well as financial services that could be channelled into the artisanal fishery operations.

Economic factors, including policies, wealth distribution, entrepreneurial abilities, cost of production and alternative sources of income, among others, have effect on poverty.

Lastly, resource availability could affect poverty as postulated by Lélé (1991), where it is through resource degradation that the various factors would drive the system to poverty. Depletion in fish stocks would deny the poor the source of their livelihood. Furthermore, the poor were known to survive on certain species. Depletion of these species would drive them into further poverty even if overall, the fishing industry was growing. The research would review the different types of threats to the ecological sustainability of the fisheries of Lake Victoria and the factors responsible for them.

The stage has not been reached where a comprehensively linked model for Lake Victoria could be expected, achieved by bringing together the methodologies, techniques, criteria and data. The possibility at the moment is for an iconic model providing representations of states and not a symbolic model with threads of relationships linking fully the model variables, derived from regression exercises. This does not detract from the model approach, which has been extremely useful in developing the research.

The concepts identified in the model were translated into measurable variables and a data collection plan developed, using secondary data search, key informant and sample survey instruments. Variables for each type of survey were allocated and sources of secondary data identified. On the basis of a comprehensive sample survey plan, field data were collected using the Key Informant and Unit Level questionnaires.

A sample of 75 research sites, namely fish landing sites and market centres were chosen for the survey. A total of 1,400 units were interviewed under the unit level survey. The sample size was considered adequate for the different categories of fishery activity units within the sample to be large enough for statistical tests to be valid. As the survey would be conducted across cultural boundaries, there was need to carry out adaptation of the survey tools to ensure that they were reliable, valid and culturally equivalent (Meadows and Wisner 2000).

Bias in the research could have been created by the rather long questionnaire used, although efforts were made to prepare the respondents for it appropriately. Other sources of bias could have been in the respondents themselves (Hedges and Ritchie 1996). Different respondents could have understood some questions in different ways. Memory may have been faulty about some issues. Respondents' analyses of their behaviour may have been inaccurate. They may not have thought about the issues so their immediate answers may not reflect the real position. Overall, however, it is believed that good quality data were captured during the research and the findings generated can be relied upon.

The survey generated both categorical and measurement data. The data were analysed using the SPSS Version 10.0 package, beginning with error tracking. With respect to the categorical data, the observations were summarised and described using frequencies and crosstabs (Kinnear *et al.* 1991). The chi-square test for relatedness

was applied to the analysis of the relationship between two categorical variables. To interpret the chi-square print out, the Pearson statistic was examined. If its significance was less than 0.05, there was a significant relationship between the variables (The Applied Statistics Centre, University of Hull 2000a).

Measurement data were examined for normal distribution prior to further analysis. Measures of central tendency were calculated to provide estimates of the population, using Custom Tables, General Tables... The standard deviation was examined as a measure of variability. Where two continuous variables were analysed, linear relationship between them was checked using Simple Bivariate Correlation.

## 5. NATURE AND DISTRIBUTION OF POVERTY IN THE FISHERIES

In this section, the objective is to identify the types of poverty prevailing within the fisheries and make poverty profiles for the different groups of people and geographical regions on Lake Victoria. The dimensions of poverty used include inadequate consumption, lack of achievement in education and health, sense of insecurity and exposure to risk.

The national official data on poverty by income activities of the heads of household showed that poverty, measured by the headcount index, declined from 55.5% in 1992/93 to 35.2% in 1999/00. Fisheries were included under the 'Non-crop agriculture' sector, where poverty fell from 52.8% to 41.4% during the same period (UBOS 2001c).

Using data from the this survey, monthly earnings of the different types of fishery units were calculated, based on data on their capital, operating costs and revenues. The data, given in Table 2, showed that based on the target species fished, the mean monthly earnings in UShs were highest for a *L. niloticus* fisher (279,473), followed by *R. argentea* (207,743) and *O. niloticus* fishers (129,278). The estimates should be seen against the background of the national per household monthly income of 141,000 (UBOS 2001c p. 48). The export market for *L. niloticus*, which resulted in high prices, could account for the high earnings. Similarly, the growing utilisation of *R. argentea* by animal feed millers had strengthened the market for the fish. *O. niloticus*, however, was landed mainly for the domestic market, where prices were low due to poverty among the consumers.

Table 2: Monthly Earnings of Operators of Fishing Units (UShs):

	Mean	Valid N
<i>O. niloticus</i> Fisher	129,278	N=280
<i>L. niloticus</i> Fisher	279,473	N=268
<i>R. argentea</i> Fisher	207,742	N=94
Average Fisher	208,030	N=610

Source: Survey Data

The mean earning of a fisher using motorised boat (436,530) was higher than that of non-motorised boat (187,223), as given by Table 3. This is attributed to the capacity of the former to reach distant fishing grounds with less competition and to carry more nets thus operate on a larger scale.

Table 3: Monthly Earnings by Mode of Craft Propulsion of Fishing Units (Ushs):

	Mean	Valid N
Motorised Unit	436,530	N=81
Non-Motorised Unit	187,223	N=424

Source: Survey Data

It was also found out that a fisher who operated with own boat earned (229,497), which was more than one who rented one for his activities (113,043), as given by Table 4.

Table 4: Monthly Earnings by Ownership of Boat by Fishing Units (UShs):

	Mean	Valid N
Own Boat(s) Unit	229,497	N=499
Rented Boat(s) Unit	113,042	N=89

Source: Survey Data

The mean earnings between fishers of different sexes were not found to be much different, namely for a man (208,891) and a woman (200,137). Earnings of labourers under different remuneration systems were examined and the one on fixed rate per time-period earned more (86,867) than the one on proportional share system (35,056).

Considering the ethnicity of the fishers, a Muganda fisher earned highest (271,208) while a Musamia earned lowest (89,191). Regional differences were also observed, with fishers from Jinja, Busia and Bugiri Districts earning lower than those from Kalangala, Rakai and Mpigi.

Different poverty lines have been prepared and used in Uganda before by UBOS. However, official statistics used the sum of UShs 100,000 per month per household as the average poverty line and found out that 60% of the population earned below that (UBOS 2001c p. 49). Based on the grouping of fishers by earnings, 47% of them earned 100,000 and below. Labourers on share system (90.5%) and those on flat rates (89.8%) had the highest proportions of fishers in this category, followed by fishers of *O. niloticus* (63.9%) and operators with non-powered canoes (48.1%). Powered-canoes operators were the least in this category (16,0%) (Table 5).

Table 5: Income Groups for the Different Categories of Fishers (%)

	100,000 & Below	100,001 to 200,000	200,001 to 300,000	Over 300,000	Total
Average Fisher	47.0	20.7	13.1	19.2	100
<i>O. niloticus</i> Fisher	63.9	16.4	10.1	9.6	100
<i>R. argentea</i> Fisher	39.4	26.6	14.9	19.1	100
<i>L. niloticus</i> Fisher	33.2	24.6	15.0	27.2	100
Powered Canoe Fisher	16.0	18.5	13.6	51.9	100
Non-powered Canoe Fisher	48.1	21.0	14.6	16.3	100
Male Fisher	46.5	21.5	13.1	18.9	100
Female Fisher	51.7	13.3	13.3	21.7	100
Labourer: Share System	90.5	7.7	.8	1.0	100
Labourer: Flat Rate	89.8	5.9	2.7	1.6	100

Source: Survey Data

On the basis of ethnicity, the Basamia (72.1%), Basoga (63.2%) and the Bakenye (62.5%) were the largest tribes within 100,000 and below category while the Baganda (38.2), Teso (50.0%) and Japadhola (57.1%) had lower proportions within the class. The districts of Jinja, Bugiri and Busia had higher proportions of their fishers in the income class of 100,000 and below while Kalangala, Mpigi and Rakai had lower proportions.

A similar set of analysis was done with artisanal fish processors and traders. Processors involved in fish smoking earned a mean of 306,413 which was higher than that of those in sun-drying (213,589). Similarly, processors in smoking were fewer (30.6%) in the 100,000 and below income group than those in sun-drying (55.0). Among the fish traders, bicycle traders earned a mean of 41,805 with 90.9% of them in the poverty category while market traders earned a similar amount of 40,756 with 89.6% in the poverty category.

As a result of the low incomes of many of the fishery operators, their food was also inadequate, consisting mainly of cassava, which was nutritionally poor in terms of energy and protein content. Other food items included maize flour, banana and beans, apart from fish. Clothing, shoes and blankets were also reported to be lacking. The

poor people lacked permanent houses, living under simple structures that lacked warmth and sometimes sanitation.

Educational achievements were examined as the next type of poverty. At the national level, Uganda was implementing the Universal Primary Education, a comprehensive strategy introduced in 1994/95 aimed at improving primary education and enhancing poverty alleviation. As a result, enrolment into primary education had risen since 1996. The national literacy rate was reported at 65% during 1999/00 (UBOS 2001c p. 15). The research data also showed that 63.4% of the fishery operators had attended primary education. Generally, the levels of education were comparable between the different groups in the fisheries (Table 6).

Table 6: Levels of Education of Fishery Unit Operators by Category (%):

Group	Level of Education						Total
	No Schooling	Primary	Secondary	Tertiary	University	Others	
General	11.1	63.4	23.4	1.9	0.1	0.1	100
Men	10.2	63.1	24.5	2.1	0.1	0.0	100
Women	13.9	64.5	20.1	0.9	0.0	0.6	100
Fishers	11.6	63.3	22.5	2.5	0.1	0.0	100
Fish Processors	16.5	63.00	19.7	0.8	0.0	0.0	100
Fish Traders	9.2	63.8	25.6	1.0	0.4	0.0	100
Factory Agents	14.3	71.4	0.0	14.3	0.0	0.0	100

Source: Survey Data

From the ethnic distribution, Baganda (67.5%), Basoga (64.7) and Iteso (64.1%) were the leading tribes with primary education and for districts, Rakai (85.2%), Masaka (72.7%) and Mpigi (69.3%) were leading. Some 11.1% of the respondents reported having had no schooling. However, it was noted that post-primary education was limited, with only 25.5% of the respondents reporting reaching secondary level and above. The study considered secondary schooling as the necessary level for providing the value of education required for life. On the basis of that, it was considered that some 74.5% of the respondents had not achieved sufficient education and were, therefore, living in education poverty.

Health issues were examined as an element of the quality of life. Uganda formulated a health sector policy with the overall goal of a good standard of health by all people for a productive life. Its objective was to reduce mortality and morbidity, among other considerations. The strategies emphasised primary health-care and provision of health services.

Concerns were, however, widely raised with respect to ill-health among the fishing communities. The main diseases reported were malaria, diarrhoea, bilharzia and HIV/AIDS, as given in Table 7.

Table 7: Multiple Response Frequencies of the Main Diseases Reported at the Landing Sites:

Type of Disease	Count	Pct of Responses
Malaria	69	46.9
Diarrhoea	39	26.5
Bilharzia	14	9.5
Skin infection	5	3.4
Measles	6	4.1
Typhoid	1	.7
Cholera	3	2.0
Chest infection	3	2.0
Others	7	4.9
Total Responses	147	100.0

Source: Survey Data

However, all these diseases were said to be controllable at the household level, given the necessary knowledge and resources. Their persistence was, therefore, a reflection of poverty in the individuals affected and the community at large. The situation was made worse by the low nutritional value of the diet and the limited access to the health services. It was, therefore, noted that there were many people within the fisheries who had not achieved good health.

The research examined situations which created a sense of insecurity among the fishing people. Certain types of insecurity were noted to originate from the fishing communities themselves. Job insecurity among the fishing labourers was often created by the owners of the fishery units. Discrimination in the affairs of the landing sites against foreigners, tribal minorities, women and poor people was common. Violence was often meted out to the weak and particularly the women. The women also suffered sexual abuse, for which they could not get adequate redress, due to discrimination and favouritism among the leadership of the communities. A sense of insecurity also originated from the malpractice of Government officials, like taking of bribe in the course of providing services or law enforcement. Fishing communities were generally accorded a low opinion and marginalised by Government officials, a situation made worse by their remote locations, limited education and poor access.

Many fishers also lived in a state of risk of experiencing an episode of income or health poverty any time. A wide range of risks and threats were identified, including failure of catch, theft of gear, boat and vehicle accidents, non-payment for catch deliveries, risk of infections, failure of market or ban on fish export, all of which had implications on the income or health of the fishery operators (Table 8).

Table 8: Main Threats to Fishery Activities (%):

	Theft	Drowning	Wild Animals	Moonlight	Others	None	Total
Fishers	59.2	7.7	8.7	5.8	12.8	5.8	100
Factory Agents	71.4	0.0	0.0	14.3	14.3	0.0	100
Fish Processors	7.5	0.9	1.0	16.0	42.5	32.1	100
Fish Traders	10.3	1.7	1.3	15.1	51.1	20.5	100

Source: Survey Data

The main concern was that there were no strong provisions in place to enable the poor to respond to such episodes, either from Government, the communities or the individuals affected.

## THE INSTITUTIONAL AND SOCIAL ENVIRONMENT

The effects of the institutional framework and social factors on poverty were analysed. The institutional framework was interpreted to mean all dimensions of the public sector. Because of its 'cross-cutting' nature, the different aspects of the institutional framework were discussed in the different places in the study. The focus was on the institutions for fisheries development, provision of social services and infrastructure development. The status of local institutions was also examined to assess their capacity to contribute towards addressing the problem of poverty among their communities.

The research recognised the new role Government had assumed as a result of policy changes, namely in enforcing market rules, collecting taxes and providing an enabling environment for business. Roles had also been separated between the Central and Local Governments. For each service, therefore, it was important to look at it at both levels. The role of the Central Government was limited to providing policy as well as aspects of the basic social services, namely health, education and safe drinking water to the population. It was also responsible for provision of vital economic infrastructure such as roads, research and extension services and good governance.

At the Central Government level the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) was one of the most important institutions with respect to poverty in the fisheries. Its mandate was to support, promote and guide the production of crops, livestock and fisheries so as to ensure improved quality and quantity of agricultural produce and products for domestic consumption, food security and export (MAAIF 2000).

Within MAAIF, however, the responsibility for fisheries was with the Department for Fisheries Resources (DFR). Following the promulgation of the Local Governments Act, 1997, certain functions and services had been decentralised and the existing role of DFR was national fisheries planning, development and monitoring of the resources as well supporting the Local Government and private sector fisheries (MAAIF 2000).

In 1992, MAAIF separated the duties of extension from law-enforcement, thus leading to the creation of the Fisheries Regulations and Control Unit (FRCU). FRCU had the mandate of effectively managing the optimal exploitation of fisheries resources, but its limitation was in the small number of staff to do the job nationally.

With respect to the planning and development, DFR had done without a comprehensive fisheries policy for a long time and only recently put in place the Fisheries Master Plan and the draft National Fisheries Policy. Some of the consequences of lack of policies and plans included poor funding for the sector, from both local and foreign sources and for both the Central and Local Government levels. Lack of sector policies and plans also meant that there was no firm commitment by Government to any clear programme in the fisheries beneficial to the poor.

With respect to resource management, DFR was not able to have in place effective legislation and regulations for managing the fisheries. Many of the laws and regulations were outdated and did not reflect recent developments in the fisheries.

DFR had weak links with research, Local Governments and the communities. As a result, it was not able to easily access scientific information on which to base fisheries management decisions; link up with the districts with respect to policies, statistics and

fisheries management or establish the poverty needs of the communities and incorporate them adequately in its programs. Inadequate facilities, skills and financial resources seriously limited the capacity of DFR to play its role. A Fisheries Authority has been proposed, having latitude of administrative and financial autonomy (MAAIF 2000). A SWOT analysis for DFR is given in Table 9.

Table 9: SWOT Analysis Table for the DFR:

<p><b>STRENGTHS</b></p> <p>The functions of the DFR are well defined. There is a sound organisational structure and roles of the different units are spelt out.</p> <p>The Fisheries Master Plan has been produced and the National Fisheries Policy is being finalised.</p> <p>The activities of the industrial processing plants are regulated.</p> <p>Fish quality inspection is carried out.</p>	<p><b>WEAKNESSES</b></p> <p>It operated without proper sectoral policies and plans for a long period.</p> <p>Co-ordination with research, Local Governments and the community is weak.</p> <p>The legal framework for fisheries management is weak and outdated.</p> <p>Implementation of fisheries management is unsatisfactory.</p> <p>Inadequate poverty reduction programs.</p> <p>Staff, equipment and funds for fisheries management are limited.</p> <p>There is no mechanism for involving the local communities in fisheries management</p> <p>The staffs are often involved in bad governance practices.</p>
<p><b>OPPORTUNITIES</b></p> <p>There is improved policy environment provided under PEAP and PMA available to it.</p> <p>Scientific knowledge and information has become increasingly available for resource management and sector development.</p> <p>National budgeting is being strengthened, to improve availability and flow of funds to departments.</p> <p>Donor funding to the sector has been increasing.</p> <p>Training opportunities exist within projects for DFR to take advantage of.</p> <p>High earnings are realised from fish export for development of the sector.</p> <p>Local communities are willing to participate in fisheries management.</p>	<p><b>THREATS</b></p> <p>Fishing communities are involved in unsustainable fishing practices.</p> <p>There are too many fishers on the lake and the population growth rate is high.</p> <p>There are limited alternative sources of livelihood outside the fisheries due to pressure on the land.</p> <p>Often, implementation of fisheries management regulations is constrained by political interference.</p>

Other institutions connected to fisheries included the Uganda Investment Authority (UIA), which was responsible for co-ordinating investment programmes in Uganda. The Uganda National Bureau of Standards (UNBS) was responsible for developing standards, including those related to fish quality. The Lake Victoria Fisheries Organisation had the responsibility of co-ordinating fisheries management between the riparian countries.

Fisheries Resources Research Institute (FIRRI) was the relevant research arm of the National Agricultural Research Organisation (NARO) mandated to undertake fisheries research in Uganda. The mission of FIRRI was to contribute to poverty eradication, food security and the conservation of the natural resource base by providing improved technologies, methods and technical advice for increased and sustainable fish production and utilisation, a healthy and productive water environment and people-centred policies for sustainable fish production. The research areas of FIRRI included capture fisheries; studies on the fish production processes and aquatic environmental health; socio-economics; aquaculture and post-harvest processes. The strategy adopted by FIRRI was to involve the community in formulation and implementation, to enable them to maximise benefits from the fishery. The Institute was involved in regional projects together with the other three riparian states on Lake Victoria, namely Uganda, Kenya and Tanzania.

Generally, research had little effect on the poor because of a number of limitations. Until recently, funding for research from Government had been inadequate. Furthermore, manpower at FIRRI was heavily biased towards the biological sciences (Geheb and Crean 2001). FIRRI also had the problem of training for its manpower in the different disciplines. The Institute maintained a wide network of collaboration with many national, regional and international fisheries related institutions and development partners. The collaboration was both financial and technical. However, limitations within FIRRI's research included inadequate focus towards poverty and lack of a bottom-up approach in the research.

Local Governments were the other institutions of relevance to the poverty in the fisheries. They were created by the Constitution of 1995 and certain powers were devolved to them from the Central Government by the Local Governments Act, 1997. These included the responsibility for extension services and a share of fisheries management. However, Local Governments operate within similar constraints as DFR. These include lack of clear extension messages to disseminate. The staffs lack facilities and resources. In order to alleviate the shortage of staff, Government recruited university graduates at sub-county level to strengthen extension services among the grassroots. However, the recruited officers lack training and experience in extension methodologies, facilities and operational funds. Like in the Central Government, services within the Local Government have also been affected by bad governance. The SWOT analysis for Local Government is given in Table 10.

Table 10: SWOT Analysis Table for Local Governments:

<p><b>STRENGTHS</b></p> <p>District funds and facilities have begun to be allocated for fisheries activities.</p> <p>Some landing site facilities have been improved upon.</p> <p>Fishing communities have been organised under the LMCs.</p> <p>Sanitation facilities have been initiated at some landing sites.</p>	<p><b>WEAKNESSES</b></p> <p>Insufficient extension services are provided to the fishers.</p> <p>Statistics on fisheries activities are poorly kept.</p> <p>Implementation of fisheries management is inadequate.</p> <p>Little training is provided to fishers through short courses.</p> <p>There is insufficient knowledge among staffs.</p> <p>Staffs, equipment and funds for fisheries activities are limited.</p> <p>Links with DFR, FIRRI and the local communities are poor</p> <p>The staffs are often involved in bad governance practices.</p>
<p><b>OPPORTUNITIES</b></p> <p>Legal provisions within the Constitution, 1995 and the Local Governments Act, 1997 and policies within PEAP and PMA are available to guide their involvement in fisheries activities.</p> <p>Budgetary provisions to Local Governments have been improving over the years.</p> <p>Donor funds are beginning to reach the districts.</p> <p>Training opportunities are available within projects for staffs.</p>	<p><b>THREATS</b></p> <p>Job insecurity is a continuous threat among staffs.</p> <p>Fishers are involved in widespread unsustainable fishing practices.</p> <p>There are limited income generating alternatives for the communities outside the fisheries.</p> <p>High rate of population growth leads to influx of people into the fisheries.</p> <p>Fisheries management is often hindered by political interference.</p> <p>There is insufficient recognition of fishers within the district populations.</p>

The institutions responsible for provision of social services, including health and education, were reviewed. Responsibility for health is vested in the Ministry of Health (MH) and the operations of MH are guided by the National Health Policy. The goal of the health sector is the attainment of a good standard of health by all people in

Uganda in order to promote a healthy and productive life, while the objective is to reduce mortality, morbidity and fertility and the disparities therein.

The implementation of the policy is based on Primary Health Care (PHC) as the basic philosophy and strategy and MH (1998) gives the details. The role of MH is to provide the policies, guidance and standards; facilitate district health services and manage nationally-run health services.

Under decentralisation policy, provision of health services is also devolved to the Local Governments. These include hospitals other than referral and medical training hospitals, health centres, dispensaries, sub-dispensaries and first-aid posts. Other responsibilities include maternity, child welfare services and control of communicable diseases, including HIV/AIDS. Rural ambulance and primary health care services are also their responsibilities.

Delivery of health services by Government has been hindered by different factors. These include insufficient facilities; poor equipping and supplying of the health units with drugs as a result of budget limitations. The staffing is also poor, with the ratio of doctor to population of 1:27,140 (UNDP 1998). The staffs receive low remuneration and as a result, there is rampant corruption within the medical services. The effect of the inadequate services provided by the Government is that many people practise self-treatment, go to private clinics or use the services of traditional healers.

Education institutions are also important for poverty reduction and the Ministry of Education and Sports (MES) is the Central Government institution responsible for education services. Its functions are formulating education policy; preparing national plans for the provision of services and co-ordinating the plans made by the Local Governments. Local Governments are responsible for nursery, primary, secondary, trade, special education and technical education.

Universal Primary Education (UPE) forms the core of the Education Sector Investment Plan (ESIP) 1997-2003. As a result of UPE, primary school enrolment rose from 2.6 million in 1995 to 5.3 million in 1997 (MFPED 2000b).

A number of factors have limited the success of UPE. They include inadequate classrooms; insufficient number of teachers and irregular payment for them and shortage of scholastic materials. The effects of the weaknesses have included high illiteracy among the fishers; high drop-out rates and a low level of educational achievement. Schools serving the fishing communities were far from the landing sites. Teachers were sometimes involved in fishery activities to supplement their income. Generally products from Uganda's educational system have been unable to find jobs. The system did not assist by providing people with any real-life skills for livelihood. In particular, the education system did not provide fisheries education to the fishing communities.

The Ministry of Works, Housing and Communication (MWHC) was responsible for infrastructure. Efficient road network is necessary for enhancement of rural incomes and poverty alleviation. The mission of MWHC is to promote an adequate, effective, safe and maintained transport infrastructure; communications system; housing and buildings.

The Ministry formulated the Road Sector Development Programme to guide development of the sector over a ten-year period. The strategy is towards efficient road administration, effective road maintenance, up-grading the relevant roads to bitumen and developing capacity among contractors and consultants. The functions of

the Local Governments are construction, rehabilitation and maintenance of roads that are not under the responsibility of the Central Government. The constraints to infrastructure development are due to inadequate financial releases, procurement delays, inadequate staffing and ageing construction and maintenance machinery. The weaknesses of the infrastructure services with respect to fisheries are in inadequate provision of access roads to fish landings, lack of landing facilities and water transport facilities.

Another important Government institution for poverty in the fisheries is the Ministry of Finance, Planning and Economic Development (MFPED). It is responsible for economic policies and for funding for all Government programmes. MFPED is said to have contributed to poverty through the social impacts of the Structural Adjustment Policies. It has also failed to mobilise finances for fisheries services, infrastructure and development.

Local institutions have been examined with respect to their effects on poverty. The expected role of local institutions is to promote development by assisting their members to take advantage of opportunities presented. Some of the key functions would include representing the interest of the communities, mobilising, involving and informing them on issues of development.

The data showed that the leadership was provided by the Local Councils (LC), the Landing Management Committees (LMC) and the Beach Leaders in that order, as given in Table 11.

Table 11: Perceived Leadership at Landing Sites:

Institution	Percent of Responses
Beach Leader	23.8
Local Council	34.3
Landing Management Committee	28.1
Fisheries Staff	5.6
Market Administration	6.3
Police/ Local Defence Unit	1.9
Total	100

Source: Survey Data

Information on these categories of institutions was obtained. LC was a state institution and LMC had its origin in the state as well, only the Beach Leader was an indigenous institution. The data further revealed that it was the LMC that made key decision on matters related to the landing site. With respect to the method of communication, it was reported to be mainly through meetings and by “word of mouth”.

In assessing the effectiveness of the local institutions a selection of criteria was used, namely whether the institutions were strong enough to play the management roles

expected of them; whether they adequately represented the poor and ensured that their interests were catered for and if they were able to adequately mobilise and inform the poor for poverty alleviation activities.

It was noted that their strength was in their local knowledge of the poverty issues and of the communities. They were also in day-to-day contact with them, given their proximity. However, the local institutions were often not strong enough to meet the challenges of modern development. Their limitations were in lack of education, exposure and experience with development issues. They lacked plans and programs for their activities. Many of the committees were divided and, unable to function as teams, so the members abandoned their work to the chairpersons only. The committees were made up of mainly the rich and the poor had little chances of joining the leadership. The information system did not favour the poor. The poor and in particular the women were victimised and abused but could not get justice from their leaders due to corruption. The institutions also lacked facilities and resources for work. It was, therefore expected that the limitations within the local institutions would hinder their role in representing, mobilising and informing the communities with respect to resource management, extension, research and provision of social services. A SWOT analysis of the LMCs is given in Table 12.

A general weakness within the institutions is the insufficient linkages within Government institutions and between Government and local institutions. However, there are plans under PMA to strengthen them by encouraging partnership formation. In view of the failures by the different institutions as noted in this chapter, it is concluded that the institutional framework has played a role in the impoverishment of the fishing communities. Action to reduce poverty within the fisheries would, therefore, need to address weaknesses within the Government and local institutions. It is also noted that the programme approach to poverty alleviation in fisheries could strengthen the co-ordination of the efforts between the different sectors and institutions.

Table 12: SWOT Analysis Table for LMC:

<p><b>STRENGTHS</b></p> <p>Use of fish poison has been controlled under the LMCs.</p> <p>Bye-laws have been instituted to streamline activities at the landing sites.</p> <p>New fishers to the landing sites have been registered and issued with fishing permits.</p> <p>Theft of fishing gear is kept under control.</p> <p>Mechanisms for settling disputes between fishers have been instituted.</p> <p>Conflicts with market operators over revenue payment are resolved.</p> <p>Fishers are informed and mobilised for developmental programs.</p> <p>Familiarity with the local situation pertaining to poverty.</p> <p>Close contact with the fishing communities.</p>	<p><b>WEAKNESSES</b></p> <p>Low leadership skills within LMCs.</p> <p>Lack of clear plans and programmes.</p> <p>Limited facilities and resources to operate with.</p> <p>Lack of recognition for the poor.</p> <p>Corruption and misuse of resources.</p> <p>Division among the leaders.</p> <p>Unfit people joining leadership of landing sites.</p>
<p><b>OPPORTUNITIES</b></p> <p>Roles have been given by the Local Governments Act, 1997.</p> <p>Government willing to form partnerships with local institutions for resource management, training, extension, research and other types of service delivery.</p>	<p><b>THREATS</b></p> <p>Low recognition by some Government officials.</p> <p>Political interference with fisheries management roles.</p> <p>Rapid resource decline.</p> <p>Water hyacinth infestation.</p>

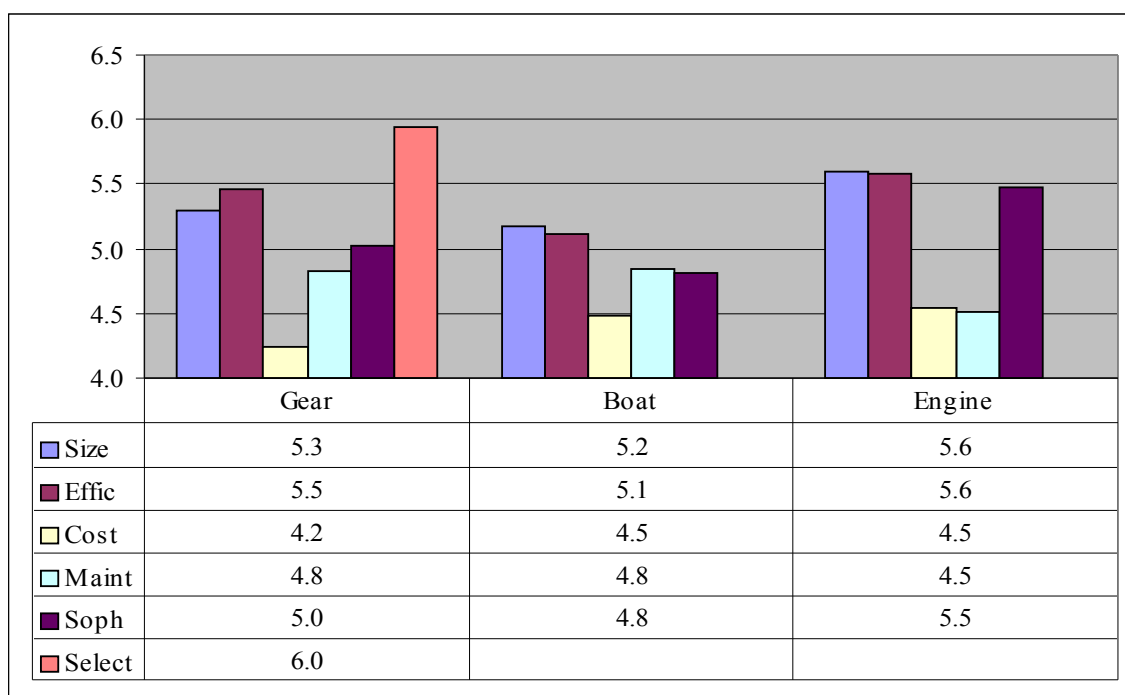
## 7. THE TECHNOLOGY OF THE POOR

The technological factor was the next to be analysed, beginning with its characteristics within the fish production and distribution systems with a view to identifying the constraints and strategies to address them. The research was, however, conscious of the conflict between efficiency of technology and resource sustainability and the need to balance between the two objectives.

The characteristics of production technology were examined. In view of the resource constraints already caused by overfishing, improvement in technology efficiency could, at best only lead to temporary gains that could not be sustained. The options were in enhancing the stocks of the lake, getting some of the users to leave the fishery or extending to the offshore waters. Government policies were for resource management and control of the number of users in the fisheries. The options for the poor to exploit the offshore resources were limited by the unsuitable production equipment. About 20.8% of the boats were of the 'parachute' type that could only be used within the inshore waters. Most of them (79.6%) were eight metres or less long and thus unsuitable for offshore operations. Furthermore, most were hand paddled, only 13.1% were motorised (LVEMP 2001). Most gill nets used (94.1%) were of less than 178 mm mesh size and thus unsuitable for offshore fishery.

Extending into the offshore fisheries would involve changes in technology, skills, infrastructure development and market, which may be too costly and out the reach of the poor. The production technologies used were expensive to acquire and maintain and were also destructive to the fishery resource base. In an exercise to rate their perception of equipment used, the fishers expressed satisfaction with selectivity, size and efficiency of gear but were dissatisfied with cost and maintenance (Figure 4). A similar exercise was done with respect to boat and engine.

Figure 5: Mean Ratings of Selected Equipment by Attribute:



Source: Survey Data

Fishing without the use of boats was regarded as a health risk, in view of the prevalence of bilharzia on the lake.

The situation of the technology in fish post-harvest fisheries was examined. The areas of concern included handling, processing, transportation, marketing and their effects on fish quality and post-harvest losses. These losses were estimated at 20% of the value of catch (Masette 2000). Delays in landing the catch and processing it once prepared were some of the responsible practices. The presence of mud, rotting weed, animal and human wastes at the landing site as well as poor transportation hastened spoilage. The different types of processing were reviewed, namely sun-drying, salting and smoking and the levels of these practices is indicated by Table 13.

Table 13: Types of Fish Processors by District (%):

District	Smoking	Salting & Sun-drying	Frying	Other	Total
Bugiri	75.0	12.5	12.5	0.0	100
Iganga	84.0	16.0	0.0	0.0	100
Mukono	75.0	20.8	4.2	0.0	100
Kampala	100.0	0.0	0.0	0.0	100
Mpigi	100.0	0.0	0.0	0.0	100
Masaka	26.7	53.3	0.0	20.0	100
Kalangala	94.7	5.3	0.0	0.0	100
Overall	80.8	15.2	1.6	2.4	100

Source: Survey Data

Several weaknesses in these practices were identified. Sun-drying was applied to small sized fish, namely *R. argentea* and the haplochromines as well as to the big fish including the tilapines and *L. niloticus*. The fish were often spread out on rocky or sandy surfaces while drying. Disadvantages of drying on the ground included the fish becoming dirty with dust and sand; animals such as chickens, dogs and rats having free access to them; the conditions being generally very unhygienic and the rate of drying slow. In salting, the practice of sprinkling the fish with salt then spreading on bare ground for drying for three to five days was reported. However, because it did not absorb sufficient salt, the product could not keep long. The recommendations to improve these processes included the use of drying racks to spread the fish and brining prior to sun-drying for the bigger fish.

Smoking was the most commonly used drying method and was applied to most species except the small-sized fish. It was practised at many landing sites because of their inaccessibility to markets of fresh fish (Reynolds and Ssali 1991). Most operators used traditional smoking kilns, while a few had made some improvements to it, mainly by elevating it above the surface of the ground. The disadvantages of the

traditional processing kilns included inefficient use of fuel, non-uniformity in the smoked product; low capacity and the need for constant attention to keep the fire burning and control the smoking process (Bostock 1987). Recommendations to improve smoking include brining the fish prior to smoking; drip-drying to eliminate excess surface water; use of several trays to save energy and fitting of a smoke spreader to allow uniform distribution of the smoke within the fish (Masette 2000). Frying was also applied, with respect to small portions of *L. niloticus* or its juveniles. This was mainly to serve the direct consumers in urban areas.

At the marketing stage, quality concerns were with the transportation vehicles, which carried a variety of other goods, creating a danger of contamination as well as of fragmentation due to the pressure on the fish. . At the market, fish stalls were often located near an open sewer, waste disposal bin, charcoal stalls and lavatories, all of which were potential sources of contaminants. Furthermore, the display tables, the chopping and scaling knives and gunny bags for covering fish were not kept sufficiently clean because most fish stalls had no, cleanable or disinfectable facilities or access to potable water.

Generally, therefore, the technology in artisanal processing and marketing could not ensure fish quality and minimise product losses. Continuous exposure to smoke was also regarded as a health hazard. Inadequate know-how and poor practices among the operators, limited resources at their disposal and lack of infrastructure and facilities were the causes of these limitations. Availability of infrastructure and facilities at the landing sites is given by Table 14.

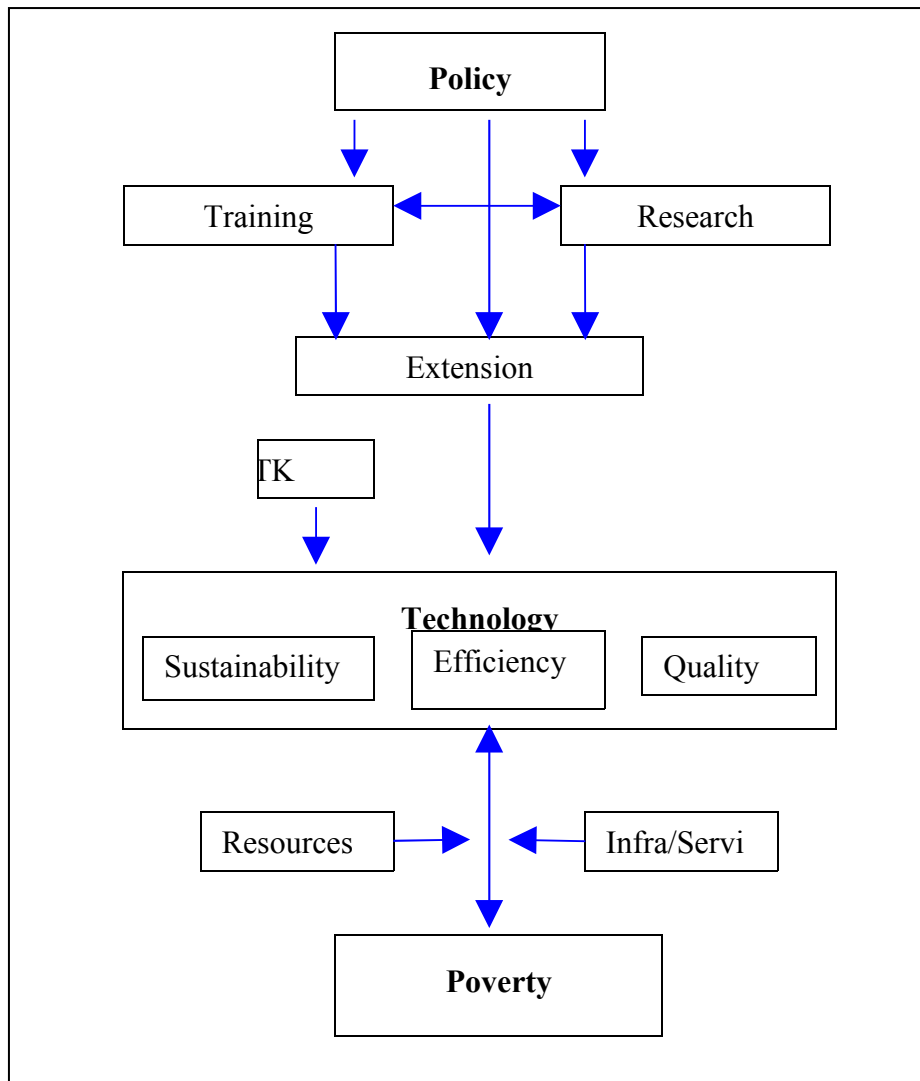
Table 14: Proportions of Landing Sites and their Associated Infrastructure (%):

District	Landing Sites (Number)	'Bandas'	Cold Rooms	Jetties	Electricity	Fish Stores	All Weather Roads	Boat Repairs	Net Repairs
Busia	4	25	0	25	0	25	100	0	0
Bugiri	74	14	0	5	4	5	7	38	38
Iganga	63	13	0	0	2	5	48	67	67
Jinja	24	4	0	4	17	4	50	13	13
Mukono	240	3	1	5	3	1	10	20	20
Kampala	6	0	0	0	17	0	83	17	17
Mpigi	57	11	5	9	11	7	53	47	47
Masaka	30	20	0	3	3	13	40	47	47
Rakai	7	14	0	0	0	0	43	71	71
Kalangala	92	17	1	11	0	64	14	58	58
Total	597	9	1	6	4	13	23	37	37

Source: LVEMP (2001) Data

From the analysis in the first part of the section and the constraints in fisheries technology identified, it could be said that the poor needed improvements in their technology towards greater efficiency and more responsiveness to resource sustainability and product quality. The needs would include improvements in tools and methods; knowledge and information; resources, infrastructure and services. A schematic representation of the factors influencing the relationship between technology and poverty is provided in Figure 6.

Figure 6: Factors in the Technology – Poverty Links:



In order to provide an understanding of how technological limitations might be addressed, the research examined the training, extension and research services available to the poor. It was noted that apart from the low levels of formal education received by the fishery operators, there was also little ‘fisheries education’ content in it. Training in fisheries was mainly provided by the Fisheries Training Institute, formerly under the Fisheries Department but recently transferred to the Ministry of Education and Sports. The course content included elementary stages of fishing gears and methods, fish handling, processing, post-harvest losses, fish quality and preservation methods. A major limitation of the technology training was that it did not prepare trainees for private sector participation in the fishing industry, but rather as ‘job seekers.’ Makerere University, through the Zoology Department, was offering a Master of Science course in fisheries and aquatic sciences. The draft National Fisheries Policy pledged to develop capacity at national, district and private sector levels to improve skills in the fisheries sector. However, it was noted that there was lack of properly organised fisherfolk leadership to implement community-based training programs.

The role of extension in technological development was reviewed. Data from the research revealed that extension activities were not frequent at most landing sites, as shown in Table 15.

Table 15: Frequency of Extension Services Received by Respondents (%):

	Once a week	Once a month	Once in three months	Once in six months	Once in one year	Total
Fishing	0.0	31.1	8.2	8.5	52.2	100
Fish Processing	2.7	41.3	5.3	2.6	48.0	100
Fish Trade	0.3	22.7	2.1	4.6	70.2	100

Source: Survey Data

The available extension was reported to cover fishing methods and fish handling. The needs of the respondents were, however, highest in ‘business management.’ Benefits received from the extension related to how to maintain the quality of fish. Uganda’s fisheries extension service had moved through a number of phases, from the Fisheries Department, to the Unified Extension System, merging crop, livestock and fisheries extension activities and recently to the districts under the Local Governments Act, 1997. Throughout its history, the main problem was the combination of fisheries extension with enforcement of regulations, both carried out by the same staffs. Government’s plans for extension were in the establishment of the National Agricultural Advisory Services (NAADS) Project, aimed at assisting poor farmers in Uganda to become aware and able to adopt improved technology and management practices to enhance productivity, economic welfare and sustainability of farming operations (World Bank 2001a).

The study examined the effect of research on technological development. This was because a successful technology development program needed an effective research component to address the fishery operators’ desires for improved methods, inputs and

information. The data showed that most of the respondents (81.6%) were not familiar with the on-going research on the lake, as given in Table 16.

Table 16: Respondents' Familiarity with Research Work in Fisheries:

Category	Research Familiarity					
	Yes		No		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Fishers	126	18.4	560	81.6	686	100
Fish Processors	23	18.4	102	81.6	125	100
Fish Traders	69	12.5	483	87.5	552	100

Source: Survey Data

The few respondents who were familiar perceived the research work to be mainly on resource base, followed by fish production. The preferences of the respondents, however, were highest for research on production, followed by resource base and marketing. Many people also felt that they did not benefit from research because it was unknown to them, as indicated in Table 17.

Table 17: Reasons Why Research did not Benefit Work (%):

	Research unknown	Conditions for acquiring knowledge not available	Findings not understood	Lack of capital for its application	Others	Total
Fishing	92.5	1.7	4.4	0.0	1.4	100
Fish Processing	93.3	2.7	2.7	0.0	1.3	100
Fish Trade	97.9	1.1	0.5	0.5	0.0	100

Source: Survey Data

Fisheries research was the responsibility of the Fisheries Resources Research Institute (FIRRI). The role of FIRRI was to provide improved technologies, methods and technical advice for increased and sustainable fish production and utilisation, a healthy and productive water environment and people-centred policies for sustainable fish production. The Institute had a broad structure to address the different dimensions of research, required of a poverty approach. It also maintained a wide network of collaborators of technical and financial nature. However, FIRRI's slow response to the concerns of the poor had been attributed to its inability to adopt bottom up approaches within her programmes.

## 8. EFFECTS OF FISHERIES RESOURCE DEGRADATION

In this section, the fisheries resource was examined as a factor on poverty among the fishing communities, as postulated in the model. The objective was to explain how fisheries resource availability affected poverty among the different sections of the communities. According to theory, a two-way relationship existed between poverty and fisheries resource degradation, driven by human as well as natural factors.

The characteristics of the fisheries resource degradation were first examined. . A review of the available catch statistics showed indications of resource decline as shown by the sharp fall in annual fish catch from 134,900 tonnes in 1993 to 103,000 tonnes in 1994 and failure to recover in the subsequent years until 1999, when it rose to 111,400 tonnes, as shown in Table 18.

Table 18: Fish Catch for Lake Victoria: 1990 - 1999 ('000 tonnes):

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Catch	119.9	124.7	129.7	134.9	103	103	106.4	106.6	105.2	111.4

Source: DFR 2000

The stagnant catch level between 1994 and 1998 was viewed against a rapidly increasing population with an annual growth rate of 2.5% per annum (UBOS 2000b). This meant that the catch per head was declining and this would affect the well being of the fishing communities.

As part of the research, respondents involved in fish production were asked to name what they considered their first and second most limiting factors to their activities. A Multiple Response frequency analysis was carried out on the responses and the results were as presented in Table 19.

Fish scarcity was identified by 29.3% of fishing respondents as their most limiting factor, second only to gear limitation (32.5%). There was also a temporal dimension to the problem of fish scarcity. As noted in Section 5, the research revealed a pattern of seasonal variation in fish catch as perceived by the communities, with a clear pattern of high and low fish catches demonstrated. Other studies had also identified the problem of fish scarcity among fishing communities (MFPED 2000d, SEDAWOG 2000b).

Table 19. Multiple Response Frequencies of the Limiting Factors to Fishery Activities:

Limiting Factors	Percentage of Responses (N=672)
Regulations	9.2
Fish Scarcity	29.3
Boat Limitation	12.5
Gear Limitation	32.4
Other Fishers	4.9
Market Limitation	4.9
Others	6.8
Total	100

Source: Survey Data

Reports by the fishing communities, based on their experiences with the fishery as well as those from scientific studies indicated that the overall catch rates were declining; catch rates for individual major species, namely *L. niloticus*, *O. niloticus* and *R. argentea*, were also falling and the proportion of immature fish in the catches was increasing. The scientific information further showed that since the 1970s, stock and species abundance on the lake had fallen (Namulemo 1998, Ogutu-Ohwayo 1998, Okaronon 1998 and Wandera 1998). The quality of the water had also been deteriorating.

Deterioration in fisheries resource was attributed to affluence among fishers, fish processors and overseas consumers, leading to catching of more fish than the needs. High population growth rates, estimated at 2.5% per annum and lack alternative employment sources in the rural as well as urban areas, increased pressure on the lake. Limited access to land, lack of farming inputs, unpredictable weather patterns and lack of market all contributed to the influx into the fisheries. Available data indicated that the number of boats on Lake Victoria Uganda had risen significantly since the 1970s, as shown in Table 20.

Table 20: Number of Fishing Boats on Lake Victoria, Uganda:

Year	Number of Boats
1972	3,200
1988	3,470
1990	8,000
2000	15,544

Sources:( Coenen & Tumwebaze 1991, LVEMP 2001, Okaronon 1998)

Catching of immature fish was encouraged by the demand created by the low purchasing power among domestic consumers. Due to poverty, many fishers could not afford the cost of the recommended fishing gear, resorting to the use of cheap but destructive fishing equipment and methods. Species introductions, particularly of the predator *L. niloticus* and of water hyacinth, also had effect on the fisheries and water quality. Human activities within the catchment of the lake resulted in pollution. Natural causes were also identified, notably eutrophication. Destruction of the shoreline wetland, functioning as a filter against pollutants, nursery and refugia for fish, exacerbated the problem. Other practices were also responsible for destroying essential fish habitats.

The effects of the different types of resource degradation on poverty were examined. Declining catch rates had impact on income poverty for producers and the effects were felt down the chain by processors and traders as well. Through diminished income, catch decline had effect on food, clothing and shelter as well as other dimensions of poverty, namely education and health status, as these services had to be partly paid for. Unpredictable catch also created risks and uncertainties among fishers and a sense of insecurity among the fishing communities.

The effect of increased juvenile catch was to decrease earnings and increase consumption poverty. It was also a poor quality commodity for consumption. Species decline had an effect on consumption poverty, as it resulted in lower incomes as well as food for direct consumption, while deterioration in water quality affected fish production and income poverty but also the health dimension of poverty. This was due to the infections associated with poor quality water. Conflicts in different areas were attributed to resource degradation and this created a sense of insecurity among the fishers, as indicated in Table 21.

Table 21: Areas of Conflict Among Fishers (%):

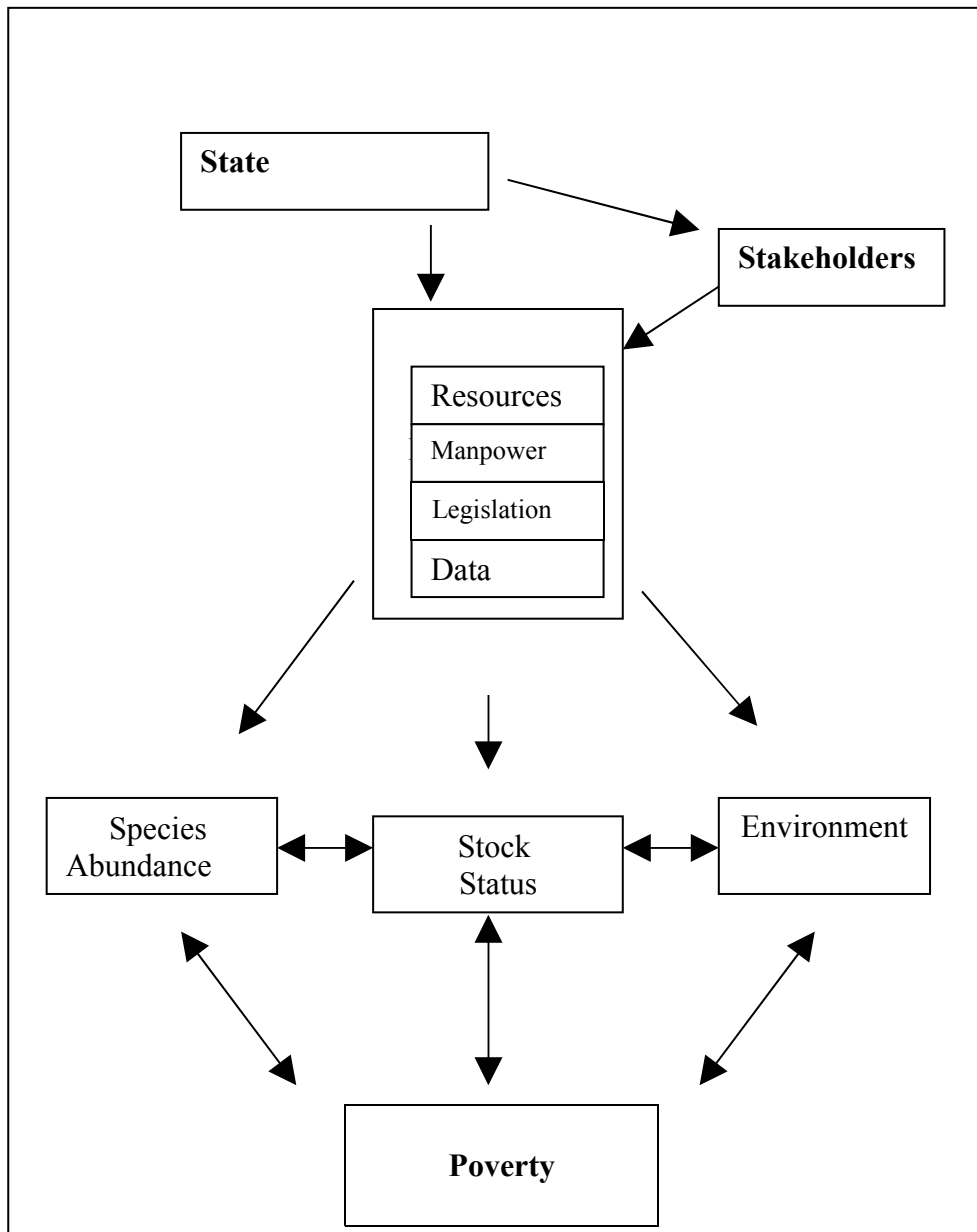
Areas of Conflict	Proportions of Respondents
Fishing ground	41.8
Share of workers	5.4
Equipment	38.1
Buyers	2.1
Price Fixing	3.8
Others	8.8
Total	100

Source: Survey Data

In order to find ways of improving the resource, the status of fisheries management was examined.

The framework to aid the analysis is presented in Figure 7, which depicts the main factors and influences within the fisheries resource and poverty relationships on Lake Victoria. The figure indicates that a two-way relationship exists between poverty and fisheries resource degradation, manifested in the different forms, driven by different human as well as natural factors. Fisheries management was an important influence in regulating the driving forces to ensure sustainability in the fisheries resource base. The figure depicts the important role of management not only for resource sustainability but also in ensuring sources of livelihood and preventing general deterioration of the fisheries environment, which could affect other dimensions of poverty. The state and the stakeholders, through their relevant institutions, could determine the success of fisheries management by supporting the various elements and functions.

Figure 7: Factors and Influences in the Resource – Poverty Relationships on Lake Victoria:



Uganda operates a state-based management system, referred to as the “instructive” type on the Sen and Nielsen (1996) model. The legal framework for the fisheries management was derived from Uganda’s Constitution of 1995, strengthened by the Local Governments Act, 1997. The Fish Act, cap 228 and the Trout Protection Act, cap 229 (1964) provided the main legislation, supplemented by subsidiary legislation and other key statutes that had direct bearing on the management of fisheries resources. However, the limitations were that many of the laws were outdated and did not reflect recent developments in the status of the fisheries as well as in principles of natural resources and environmental management. The scope of some of the laws was limited and the fees and fines too small. The rules on fish sizes only covered *L.*

*niloticus* and the tilapines and the legal measures governing small-scale processors and traders were inadequate. Generally, the fishing rules were said to be ambiguous (Geheb and Crean 2001). Despite these weaknesses, however the positive aspect was that effective licensing on the main post-harvest sector, namely the industrial processing, was introduced (EPRC 1999).

However, the success of implementation of the management was generally low. There were no gazetted places on Lake Victoria for landing of fish and landing sites were operating outside the provisions. Fishing was done at night outside the authorised hours of between sunrise and sunset. Prohibited fishing areas in the Fish Act had not been fully set out, leading to overfishing of certain species of fish in certain areas. There was poor enforcement of the existing law mainly due to weakness in the administrative machinery, lack of resources and apathy. There were no patrol boats to transport Fisheries staff on duty. There was a shortage of trained personnel and scarcity of financial resources to meet the operational expenses. There was lack of involvement of local communities in the management of fisheries resources. The open access regime and the common property nature of the resource were other important limitations. Initiatives were going on to put in place a new fisheries management system, and the two regional projects, LVFRP and LVEMP were involved in working out the details and resolving any contradictions arising between the different parties.

Since Lake Victoria was a trans-national lake, the Lake Victoria Fisheries Organisation was set up to promote better management of fisheries resources on the lake and to co-ordinate fisheries management with conservation between Uganda, Kenya and Tanzania.

What remains a challenge is, however, how to make fisheries management contribute to the goal of poverty alleviation. This would require ensuring that the interests of the poor are adequately taken into consideration in the process of improving the management. This is because many of them are users of illegal gear, so there is need for a program to assist them to adopt sustainable fishing practices while at the same time settling some of them on other livelihood activities. Poor people were reported to suffer a sense of insecurity within the landing site communities, so enhancing their participation under a co-management system for the fisheries resource needs to be addressed. Furthermore, action is needed towards the state of risk to which the poor were exposed through appropriate programs. The range of accompanying action was, therefore wide, calling for effective integration with other policies and programs in the country.

## 9. ECONOMIC FACTORS IN POVERTY

Analysis of the effects of economic, marketing and financial factors was carried out, starting with a review of Uganda's recent economic policies under the Structural Adjustment Programme. One of the policies was financial austerity, aimed at balancing the budget and reducing inflation in the country. It involved public expenditure cuts, higher taxation and introduction of cost-sharing in the provision of basic services. However, it is reported to have had the effects of raising production costs in the economy and limiting access to health and education for the poor, prior to the recent UPE policy.

The privatisation policy was intended to transfer the ownership of business enterprises from public to private hands for greater efficiency. Its effect within the fisheries was that Government withdrew from its earlier role of supplying inputs, which had moderated their prices to the fishers.

The market liberalisation policy reduced controls over the domestic as well as the export trade, aimed at creating a conducive environment for business. Although this led to increase of fishery inputs on the market, the policy resulted in increases in foreign exchange and interest rates, resulting in higher costs for imported inputs and of loans.

The investment promotion policy was aimed at encouraging private investment through tariff reduction and provision of tax incentives. Other provisions included relaxation of restrictions on profit repatriation for foreign investors and assurances of the security of their assets against any forms of expropriation. The policy, in conjunction with the others, stimulated rapid growth of industrial fish processing, as indicated in Table 22.

Table 22: Number of Industrial Fish Processing Firms, Total Approved Capacities, Fish Purchases and *L. niloticus* Prices, 1990 – 1997\*.

Year	No. of Firms	Approved Capacity (Tonnes/Year)	Fish Purchases (Tonnes/Year)	<i>L. niloticus</i> Prices (UShs/kg)
1990	3	14,300	4,992	300
1991	6	30,680	14,061	400
1992	7	31,980	14,553	500
1993	9	39,780	18,414	400
1994	9	39,780	19,692	800
1995	12	50,180	48,138	800
1996	13	51,480	39,300	1,000
1997	9	35,880	30,840	1,000
1998	9	35,880	24,000	1,000

Sources: MFPED 1998, DFR & Fish Processing Industries records  
 \* Annual estimates based on 260 working days in a year.

This resulted in increased earnings to fishers, creation of jobs and greater foreign exchange earnings for the country. However, it was observed that the poor were not able to take advantage of the rising fish prices because of the high level of investment in boat, gear and engine required for fishing *L. niloticus*. Industrial fish processing and export also resulted in the loss of livelihood opportunities to artisanal processors and traders (Abila & Jansen 1997). It deprived many domestic consumers of a source of fish due to the high prices created and led to the increase in demand for juvenile fish. This posed a significant threat to the sustainability of the fisheries resource, leading to further poverty among the fishers.

Through export trade, fishers were exposed to external risk over which the country had little control. Fish price increases caused an influx of people to the landing sites, creating sanitary and health problems. On another front, the privatisation policy led to the ending of subsidies and the poor lost the opportunity to obtain inputs at affordable prices.

The research also examined the perceptions of the fishery operators to Government policies. The findings showed that fishers and fish traders were thought to be more affected by policies than traditional processors. Trade liberalisation was the policy most frequently reported to have effect, followed by investment promotion, as given in Table 23. These results could be explained in that liberalisation increased availability of inputs and expanded fish market for the operators. Investment promotion policy led to establishment of the processing plants, creating market for fish and business for the agents. The data revealed that 'higher prices' was the most highly rated policy advantage among the fishery operators.

Table 23: Policies Perceived to Affect Fishery Activities (%):

Category	Investment Promotion	Liberalisation	Privatisation	Decentralisation	Other Policies	Total
Fishing	33.3	37.7	5.1	22.1	1.8	100
Factory Agent	57.1	28.6	--	14.3	--	100
Fish Processing	25.9	44.4	3.7	24.1	1.9	100
Fish Trade	23.2	38.7	6.0	29.8	2.3	100

Source: Survey Data

Turning to the role of marketing, the research reviewed the previous studies on the field, noting that the issues identified had included: supply fluctuations, product spoilage, inadequate business knowledge among traders and lack of financial resources. This was followed by analysis of the socio-economic characteristics of the marketing operators, covering sex, age, level of education, number of years in fish trade and to whom the fishers sold their fish. The most common traders were men, of the economically active age group of 18-35 years and had received primary school education. The majority had been in fish trade for less than five years (43.9%

N=651). Most people involved in catching fish reported selling to bicycle traders (53.4%). This was an indication that the domestic market was small, scattered, with poor transportation network and best served by bicycle traders.

The trading assets were mainly the means of transportation, namely bicycles, motorcycles, light and heavy trucks. In addition, the traders made use of weighing scales, fish boxes, baskets and raised platforms for display of fish. The quantities as well as values of the assets were little, reflecting small investment levels in the trade, characteristic of artisanal operations. The data showed that the average weekly quantities of fish traded were also small, in line with the little investments, as indicated by Table 24.

Table 24: Weekly Mean Quantities of Fish Traded and Prices:

Species	Quantities handled (kg)	Buying Price (UShs/kg)	Selling Price (UShs/kg)
<i>L. niloticus</i>	183	808	1,227
<i>O. niloticus</i>	137	821	1,215
<i>R. argentea</i>	90	432	657

Source: Survey Data

Variable levels of labour were hired to assist with the functions of gutting, scaling, washing and packing supplies. Family members were not deployed much, except by boat traders who needed them for boat operations. Other inputs into fish trade included fuel, ice, wrapping materials and preservatives of which the traders believed fuel and ice were major constraints to their operations.

The research examined the effect of the marketing system on the impoverishment of the fishery operators. The concern of the fishers was that for many of the remote landing sites, particularly, on the islands, there was little contact with the fish buyers and consignments were handled by 'kinala' operators, for commission. In the process, prices received were so little that they did not reflect resources and effort put into fishing (Kamuturaki 1998). This is indicated by Table 25. Fish losses were also frequently experienced.

Table 25: Fresh *L. niloticus* Prices at Selected Landing Sites in Mpigi District, 1999  
(UShs/kg):

Accessible Landing Sites			Isolated Landing Sites		
Busabala	Nangombe	Nakabugo	Kagulube	Bwerenge	Kachanga
850	600	641	450	433	420

Source: Survey Data

Even at the major landing sites where producers sold directly to traders, it was the latter who set the prices. Fishers were, therefore, impoverished by the marketing system due to low prices, lost fish and lack of voice in setting prices. All the elements of poverty were relevant here, namely low earnings, limiting the ability to pay for education and health services, risk of fish loss and insecurity due to lack of voice in price setting.

On the domestic market, fish traders faced competition with processing plants over supply, which reduced their earnings. Low purchasing power among their consumers, inadequate information about the market and lack of financial services for their activities were other constraint on their earnings. There were risks and uncertainties associated with unavailability of transport, too few customers or too much fish on the market on a particular day. Traders often operated under threats and insecurity due to corruption and intimidation by tax collectors, health inspectors and fisheries officials. So the marketing system also had the effect of income poverty, risk and sense of insecurity to the traders.

Government policies on marketing were reviewed, noting that the emphasis by the draft National Fisheries Policy was on improving the physical provisions for marketing, with a focus for the external market. There were also no provisions for strengthening the integration of the fish market into the national economy with a view to taking advantage of the intersectoral linkages necessary to improve fish marketing.

The research examined the financial situation within the fisheries with a view to assessing its role as a factor in poverty. Experiences from successful parts of the developing world had shown that financing could be an important tool in engaging the poor in economically productive activities. The data showed that for each category of operators, the majority of operators used their own savings as starting capital, as shown by Table 26.

Table 26: Sources of Capital for Fishery Operations (%):

	Owner's Savings	Loan from Fish Traders	Loan from Credit Institutions	Family Capital	Other	Total
Fishing	89.6	1.0	0.8	5.2	3.4	100
Factory Agent	71.4	14.3	0.0	0.0	14.3	100
Fish Processing	78.5	4.0	1.6	12.7	3.2	100
Fish Trade	79.7	4.2	1.5	11.2	3.4	100

Source: Survey Data

Similarly, most of the unit owners were fully responsible for meeting operating costs, while only a few shared them with labourers. Revenues were, however, mostly shared in agreed proportions with labourers. The information, therefore, revealed a dominant pattern of sole proprietorship in the fishery operations. Most of the earnings from fish work went into consumption, namely for maintaining the household and paying school fees, as indicated by Table 27.

Table 27: Utilisation of Earnings from Fish Work (%).

	Maintain Household and Pay Fees	Re-Invest in Fisheries	Invest Elsewhere	Buy Assets	Others	Total
Fishing	54.0	29.1	10.4	5.4	1.1	100
Factory Agent	57.1	21.4	14.3	7.2	0.0	100
Fish Processing	63.4	26.3	6.5	3.8	0.0	100
Fish Trade	64.1	21.6	7.9	6.2	0.2	100
All Respondents	58.6	26.0	9.2	5.6	0.6	100

Source: Survey Data

Table 27 shows that all categories of fishery operators also spent part of their earnings on acquiring assets, with factory agents spending highest proportion, followed by the other fish traders. Accumulation of assets is important because in time of need, they could be converted into cash, depending on the nature of the assets.

Respondents were, therefore, asked what assets they owned and the information summarised in Table 28.

Table 28: Mean Number and Value of Wealth Items Owned by Fishery Operators:

	Iron Roof House		Land		Vehicle		Motorcycle	
	No.	Value	Acre	Value	No.	Value	No.	Value
Fishing	0.4	1,015,987	1.5	686,299	0.0	92,757	0.0	8,871
Factory Agent	0.1	71,429	1.7	785,714	0.0	0	0.1	142,857
Fish Processing	0.3	441,260	0.5	177,283	0.0	0	0.0	5,276
Fish Trade	0.2	430,750	0.8	345,670	0.0	228,179	0.0	4,982
All	0.3	723,781	1.1	503,586	0.0	138,242	0.0	7,654

Table 28 (cont.)

	Bicycle		Cattle		Goat		Radio	
	No.	Value	No.	Value	No.	Value	No.	Value
Fishing	0.4	31,131	0.7	91,217	1.0	17,182	0.5	30,152
Factory Agent	0.3	14,286	0.3	35,714	0.0	0	0.7	40,714
Fish Processing	0.1	5,858	0.4	54,551	0.5	7,795	0.4	20,236
Fish Trade	0.3	18,554	0.2	47,741	0.3	5,088	0.5	23,324
All	0.3	23,692	0.5	70,133	0.7	11,382	0.5	26,559

Source: Survey Data

Table 28 shows that generally, the operators owned few items of wealth, both in mean numbers and values. They were not really rich by any standards. However, Table 27 shows that most respondents had used their money to acquire permanent assets, namely houses and land. However, these assets would not be easy to convert to cash, if an operator wanted to expand his/her activities. Furthermore, they would not help in securing a loan because they would have low value due to their location in the rural areas. Although the fishery operators have put effort in obtaining some assets, the assets would not help to improve their financial base for business. This is, however, not to imply that the assets were totally worthless. Within the Ugandan societies, ownership of a permanent house and land is greatly valued. However, from the point of view of financing for the business, they would not be of much assistance because of the problem of convertibility into cash.

Access to credit among the operators was investigated. Respondents were asked to indicate if they had obtained any credit for their activities over the last three years. The responses are summarised in Table 29.

Table 29: Respondents Who Received Credit Over the Last Three Years (%):

Category	Yes	No	Total
Fishing	18.5	81.5	100
Factory Agent	57.1	42.9	100
Fish Processing	15.4	84.6	100
Fish Trade	15.4	84.6	100
All Categories	17.2	82.8	100

Source: Survey Data

Among most categories, the majority of operators did not receive any credit over the last three years, except for the factory agents where some 57.1% did receive credit. On further probing, it was established that much of their credit came from the fish factories, which advanced them cash to purchase fish and supply to them.

The need for capital was expressed and the lack of sources of finance was identified as a constraint that hindered the development of the units. There was also lack of general financial services, namely safe custody and transfer services for funds, leading to theft of cash that impoverished them further. Existing micro-finance credits in the country were examined. The Government funded and operated 'entandikwa' credit scheme was the main source, intended for the poor. However, it had not achieved its goal, particularly among the fishery operators because it was politically implemented and did not target the poor; the interest rate of 16% per annum was considered too high for poor people and the period of 12 months was too short. Loan recovery was poor, there was little monitoring and accountability by the implementers was unsatisfactory (Muhumuza 1998). Financial proposals under the

draft National Fisheries Policy focused on drawing funds from the industry for the purpose of fisheries management and development, and not to support private sector development.

The study examined a selection of other economic factors that affected earnings. Low level of entrepreneurship was observed among the operators, indicated by lack of interest in maintaining books of accounts (Table 30), low level of education, high consumption rates and the use of poor technology.

Table 30: Respondents Who Kept Books of Account (%):

Category	Yes	No	Total
Fishing	39.7	60.3	100
Factory Agent	71.4	28.6	100
Fish Processing	39.7	60.3	100
Fish Trade	31.7	68.3	100
All Categories	36.6	63.4	100

Source: Survey Data

The problem of risk in fish marketing was also further examined and evidence from the different parts of the study indicated wide prevalence of it, involving risk of drowning, failure of transport, unpredictable fish prices, product deterioration and theft of cash. However, the majority of the respondents (53.6%) reported that they had no safeguards against them.

Coping strategies were investigated among the operators, in terms of complementary activities to fish work, but most of the respondents (61.8%) had none. Of the few who had any, farming was the most common complementary work, as given in Table 31.

Table 31: Complementary Activities of Fishery Operators (%):

Category of Operators	Farming Related Activities	Trading in Other Goods	Providing Services	Cottage & Craft	Other Activities	Total
Fishing	59.2	20.4	9.0	4.2	7.2	100
Factory Agent	50.0	50.0	0.0	0.0	0.0	100
Fish Processing	61.1	19.4	11.1	5.6	2.8	100
Fish Trade	61.5	30.5	4.0	2.0	2.0	100
All Categories	59.9	23.4	7.7	3.6	5.4	100

Source: survey Data

Most wives of the fishers were simply occupied with housework. Therefore, they had limited coping strategies and were vulnerable in case of any episode. There is need for sensitisation for fishers on the importance of supplementary income activities to address the problem of vulnerability. They should also be equipped with the necessary skills, through a program involving training, extension and research and resources should be availed to them through appropriate Micro-Finance Intermediaries. Interventions to address the different dimensions of poverty in the fisheries should, therefore, involve fishery as well as no-fishery programs in a holistic approach to broaden the income opportunities.

Linkages and externalities were also investigated for their effects on the activities of the operators. It was noted that fish traders and fishers had the highest effects on each other and on other categories of operators, as shown by Table 32. The positive effects were mainly in providing supply or market for the others, social support and information while the negative ones were competition for supply or market and excessive demands for contributions, particularly by the local institutions. The information on linkages was important for operators so that they could develop strategies of managing them to their advantage. Training would be required to provide them with knowledge and skills to achieve this.

Table 32: Effects of Fishery Activities on Each Other (%):

	Fisher Effect		Processor Effect		Trader Effect		Factory Effect		Outside Effect		Fish. Ass. Effect	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Fishing	57.9	42.1	32.1	67.9	73.7	26.3	28.7	71.3	38.0	62.0	28.2	71.8
Factory Agent	83.3	16.7	57.1	42.9	100	--	57.1	42.9	71.4	28.6	66.7	33.3
Fish Processing	53.2	46.8	66.7	33.3	65.9	34.1	37.0	63.0	30.5	69.5	16.0	84.0
Fish Trade	58.7	41.3	27.5	72.5	68.1	31.9	33.8	66.2	39.1	60.9	14.3	85.7
All Categories	57.9	42.1	33.6	66.4	70.9	29.1	31.7	68.3	37.9	62.1	21.6	78.4

Source: Survey Data

## 10. CONCLUSIONS AND RECOMMENDATIONS

The overall goal of the research was to contribute to the understanding that could be applied to the enhancement of the quality of life of Uganda's fishing communities of Lake Victoria. The research sought to establish the nature and causes of poverty and the options for intervention with a view to assessing Uganda's recent national, agricultural, fisheries sector and environmental policies and programs on Lake Victoria.

The first objective was to establish the nature of poverty among the fishing communities of Lake Victoria, Uganda. The research achieved this by identifying cases of the different forms of poverty in the fisheries. The definition of poverty adopted included inadequate basic necessities, low education and health achievements, a sense of insecurity and exposure to risk.

The second objective of the study was to identify the activities within fisheries that were associated with poverty. Data collection covered three broad categories of activities, namely production, processing and marketing. In order to fulfil this objective, therefore, poverty profiles were produced for operators in the three activities. The data showed that the highest proportions of respondents in poverty were within fish marketing, followed by processing and lastly, fish production.

The third research objective was to determine the distribution of poverty within the different groups of people and districts on Lake Victoria. In order to achieve this objective, the data were disaggregated by sex, tribe and district of the fishers and poverty profiles produced for each of these groups.

The fourth objective was to identify and analyse the causes of poverty within the groups and regions affected. With the help of the research model, the factors identified included the institutional and social factors, inadequate or unsuitable technology, degradation in the fisheries resource base and market, financial and other economic imperfections.

The study made use of approaches that brought together a wide range of issues and related them to the Lake Victoria situation. Different skills have been used to examine the different issues. The stage had not yet been reached where a comprehensively linked model for Lake Victoria could be expected, achieved by bringing together the methodologies, techniques, criteria and data. The possibility at the moment was for an iconic model providing representations of states and not a symbolic model with threads of relationships linking fully the model variables, derived from regression exercises. This does not detract from the model approach which has been extremely useful in developing the research.

The study was able to link the findings from the literature review and the research methodologies; conceptualise the fish sector as well as the poverty dynamics on Lake Victoria. It identified measurable variables that would reflect the concepts within the fishery sector and the poverty models; formulated a workable data collection plan for Lake Victoria fisheries and designed data collection instruments. Methodologies have, therefore, been refined and lessons learned for replication elsewhere. New data sets on the fisheries of Lake Victoria have, in the process, been generated.

One of the objectives of the study was to identify the necessary types of intervention for poverty reduction, through policies and programs and their appropriate points of

application. This has been attempted at different stages on this report. This section is intended to contribute further towards fulfilling this objective by consolidating the recommendations of the research as outlined below:

- i) In view of the finding that different dimensions of poverty were prevailing in the fisheries, namely inadequate incomes for the basic necessities, low education and health achievements, a sense of insecurity and exposure to risk, it is recommended that design of poverty reduction measures takes a broad approach, as no single measure would be able to address all the different types of poverty.
- ii) The research identified variations in poverty levels within the different fisheries activities, social groups and districts. Intervention measures should, therefore, be designed so that they are applicable to and target the relevant activities, groups and geographical locations most affected.
- iii) SWOT analyses of the institutions for fisheries development, social services and infrastructure revealed weaknesses and opportunities that could be exploited to enhance their contribution to poverty reduction. It was further noted that the programs of the institutions did not focus on poverty in fisheries sufficiently. However, it was revealed that many provisions already existed under PEAP and PMA to address the institutional weaknesses and capture the opportunities identified. It is, therefore, recommended that the institutions endeavour to remove the weaknesses identified, using provisions already available under PEAP and PMA. Furthermore, it is recommended that they refocus their priorities and programs to ensure that poverty in fisheries is adequately targeted and capacity built to implement programs aimed at reducing it.
- iv) The research concluded that the technology available in the fisheries did not promote resource sustainability or fish quality preservation and led to substantial post harvest losses. It is, therefore, recommended that FIRRI and FOSRI put in place the necessary facilities and establish the required links with the fishery operators in order to conduct on-site trials with improved equipment and methods successfully applied elsewhere, for their adoption.
- v) In view of the insufficiency of formal education and fisheries knowledge among fishers, arising from limitations within the educational system, the fisheries institutions and the Local Government, it is recommended that in order to enhance knowledge of the fishers and to improve their human capital, fishers should be encouraged to take advantage of UPE to acquire literacy and proceed to secondary school, and even higher, to attain basic education. It is further recommended that fisheries knowledge be introduced into the syllabi of schools as an option for the districts on Lake Victoria. In order to provide specialised fisheries training for both managers and resource users, FTI should be strengthened, its syllabi improved and its functions extended to cater for the artisanal fisherfolk as well. Local Governments and NGOs should take responsibility for short courses for resource users.
- vi) It is recommended that a new system for fisheries extension be designed, with improved content and effective delivery systems for technology that is cost-effective, promotes resource sustainability and fish quality. In view of provisions already made within PMA for strengthening agricultural extension

through establishment of NAADS, it is recommended that those provisions be strengthened to adequately cater for the needs in fisheries extension.

- vii) In view of the research findings that information about the fisheries research activities did not effectively reach the beneficiaries; research did not address the needs as seen by them and findings were largely unknown to them, it is recommended that mechanisms of involvement of the fishing communities in the research processes be identified and instituted, also designed to improve communication.
- viii) In order to make fisheries management contribute to the goal of poverty alleviation, it is recommended that the proposed fisheries management plan for Lake Victoria includes provisions to assist the poor to adopt sustainable fishing practices while also supporting some of them to make an exit from fisheries and set up alternative livelihood activities in other fields. Furthermore, it should address the sense of insecurity born by poor people, which will hinder their participation in the proposed co-management systems.
- ix) The analysis of the effects of the key economic policies revealed some major consequences for poverty reduction in fisheries. This raises the need to ensure that the impacts of national policies on fisheries are fully established and adequately addressed. In order to achieve this, it is recommended that FIRRI incorporates policy research into its programmes and builds capacity for it.
- x) Marketing in fisheries was found to be affected by physical limitations and the nature of competition, which influenced the pricing methods for fish. It is recommended, therefore, that to overcome the physical limitations, namely poor infrastructure, services and product quality, the successful implementation of the relevant provisions within PEAP and PMA should be ensured, through measures to remove the relevant obstacles. The competitive nature of the market is expected to improve once the physical obstacles are removed. This calls for strengthening of the necessary links between fisheries and the rest of the economy.
- xi) It was found out that fishery operators had limited access to credit facilities as well as to other financial services. It was also noted that relevant proposals were available for developing MFIs for the agriculture sector under PMA. It is, therefore, recommended that the proposals under PMA be strengthened and refocused to adequately target the fisheries as well. In view of the unique nature of the fisheries enterprises, it is proposed that the MFIs for fisheries should be different from the others, to avoid fishers being marginalised.
- xii) One of the weaknesses in dealing with the risk dimension of poverty in fisheries was the limited coping strategies, in case of an episode of income or health. It is, therefore, recommended that in order to address the problem of vulnerability, fishery operators should first be encouraged to develop the culture to save when the catches are high. Secondly they should be advised on appropriate wealth items to accumulate that can be readily converted into cash in time of need. Lastly they should be sensitised on the importance of supplementary income activities. For this purpose, they should be equipped with the necessary skills, through a program involving training, extension and research. Resources should be availed to them through appropriate MFIs.

These recommendations should be implemented with the full participation of the relevant NGOs and CBOs.

- xiii) The research provided information on the poverty profiles in the fisheries. It identified the activities, groups and regions affected by poverty and the roles played by different factors. In doing this, it has gone a step ahead to fill the socio-economic information gaps reflected within PMA and NFP. It was observed that despite PMA being intended to cater for poverty within the broad agriculture sector including fisheries, its focus was on crops. NFP also raised concern about poverty but did not articulate the problem in any detail nor make specific provisions to reduce it. In both cases, this is attributed to inadequate information on the poverty situation in fisheries. The relationship between poverty and resource degradation has been well recognised and this study has demonstrated its relevance to Lake Victoria fisheries. It is, therefore, recommended that the relevant provisions of PMA and NFP be revised and strengthened in light of the improved information on poverty in the fisheries provided by this study.
- xiv) The research methodology was improved by reference to the World Bank Model of Poverty Causation, the Lélé Model of the Poverty-Environmental Degradation Problem and the subsequent Lake Victoria Model of the Poverty Factors in Fisheries, developed on this study. Although it has not provided a model with the interlinking causal relationships, the study has provided a plan for the research and data collection. Qualitative as well as quantitative analysis will always be required. Even if it is unlikely that a symbolic model will ever be achieved, it is recommended that future research builds on this model approach as it has borne fruit in this study and will certainly do so in the future, particularly when attempting to forecast changes arising from interventions.

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## Appendix 1: QUESTIONNAIRE

### Fisheries Resources Research Institute

### STUDY OF POVERTY AND COMMUNITY INVOLVEMENT IN HARVESTING, PROCESSING AND MARKETING IN THE FISHERIES.

#### UNIT SURVEY QUESTIONNAIRE:

Name of enumerator \_\_\_\_\_

Date \_\_\_\_\_

1. Landing \_\_\_\_\_

2. Region \_\_\_\_\_

3. District \_\_\_\_\_

*LVEMP has been put in place by the Governments of Uganda, Kenya and Tanzania, with financial support from the World Bank, to improve and sustain the benefits from the lake basin, conserve biodiversity of the lake and control further environmental degradation. As part of the Project, we would like to examine the involvement of people in the different types of fish work and how they could benefit more from the lake.*

#### **A. Personal data:**

4. Name of participant \_\_\_\_\_

5. Age \_\_\_\_\_ years

6. Sex [1] Male  
[2] Female

7. Tribe [1] Teso  
[2] Muganda  
[3] Samia  
[4] Musoga  
[5] Alur  
[6] Mugungu  
[7] Mukenye  
[8] Japadhola  
[9] Others

8. Marital status:  
[1] Married  
[2] Single  
[3] Divorced  
[4] Widowed

9. How many children do you have? (*alive*) \_\_\_\_\_

10. How many other dependants do you have? \_\_\_\_\_

11. How long have you been in fish work? \_\_\_\_\_ years

12. What is your level of education? (*tick one*)  
[1] No schooling  
[2] Primary  
[3] Secondary  
[4] Tertiary  
[5] University  
[6] Other (specify) \_\_\_\_\_

13. What is your level of involvement in fisheries?  
[1] None  
[2] Part time  
[3] Full time

14. If None, have you been in fish work before?

- [1] Yes => go to Qu. 16
- [2] No => terminate interview

15. If Yes, how long ago?

- [1] One year or less ago. => go to Qu. 17
- [2] Over one year ago. => terminate interview

16. What fish activity are you engaged in? (tick all that apply and proceed to the relevant section)

- [1] Fishing => go to Section B
- [2] Factory agent => go to Section D
- [3] Fish processing => go to Section C
- [4] Fish trade => go to Section D

**B. Fish Production**

17. Are you able to do as much fishing as you would like to?

Poor[1] [2] [3] Good

18. If poor, what is the most limiting factor?

- [1] Regulations
- [2] Fish scarcity
- [3] Boat limitation
- [4] Gear limitation
- [5] Limitations by other fishers
- [6] Market limitation
- [7] Other (specify) \_\_\_\_\_

19. Do you own boats?

- [1] Yes
- [2] No => go to Qu. \_\_

20. If Yes, how many? \_\_\_\_\_

21. Provide information on up to two of the boats as below:

	<b>Boat 1</b>	<b>Boat 2</b>
Boat type		
Boat material		
Length of boat		
Number of crew		
Method of propulsion		
Year of acquisition		
Cost of boat		

Boat types include: [1] Ssese [2] Parachute [3] Dug-out [4] Others

Methods of propulsion: [1] Hand paddle [2] Outboard engine [3] Sail

Boat materials: [1] Wood [2] Fibre glass [3] Other

22. If boats are engine-propelled, provide information on engines as follows:

	<b>Engine 1</b>	<b>Engine 2</b>
Horse Power		
Year of acquisition		
Maintenance cost/month		
Purchase cost (current price)		
Source of funds		

Source of funds: [1] Own savings [2] Loan

23. Do you own fishing gear?

[1] Yes

[2] No => go to Qu. \_\_

24. If Yes, provide information on gear owned as below:

<b>Gear type</b>	<b>No</b>	<b>Cost</b>	<b>Target species</b>
Gillnet			
Beach seine			
Mosquito seine			
Cast net			
Long line			
Fishing rod			
Trap			
Other			

Target species include: [1] Nile perch [2] Tilapia [3] Mukene [4] Others

25. Have you adopted a new technology over the last 3 years?

[1] Yes

[2] No =. go to Qu.

26. If Yes, what technology?

[1] Use of ice

[2] Refrigerated truck

[3] Improved kiln

[4] Salting

[5] Outbord engine

[6] Other (specify) \_\_\_\_\_

27. What new technology would you need?

[1] Use of ice

[2] Refrigerated truck

[3] Improved kiln

[4] Salting

[5] Outbord engine

[6] Other (specify) \_\_\_\_\_

[7] None

28. How many labourers work on the boat and how much are they paid?

	Number		Amount paid (Shs/week)
	Male	Female	
Workers owning nets			
Labourers with no nets			
Family helpers			
Other workers			

29. What is your average weekly catch and price by species fished?

Species fished	Catch (Kgs)	Price Shs/Kg
Nile perch		
Tilapia		
Rastrineobola		
Others		

30. How many days a month do you operate? \_\_\_\_\_

31. How many hours is a fishing trip? \_\_\_\_\_

32. What method(s) do you use for remuneration?

- [1] Share
- [2] Flat rate
- [3] Other

33. Indicate the level of your catch during the different months of the year:

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Level of catch												

Levels given as: Poor[1] [2] [3] Good

34. To whom do you sell your fish?

- [1] Factory agents
- [2] Bicycle traders
- [3] Resident landing-side traders/processors
- [4] Truck traders – domestic
- [5] Truck traders – regional trade
- [6] Boat traders
- [7] Consumers on beach
- [8] Others: (specify) \_\_\_\_\_

### C. Fish processing

35. What type of fish processing are you involved in?

- [1] Smoking
- [2] Salting/sun drying
- [3] Frying
- [4] Other (specify) \_\_\_\_\_

36. Why have you chosen to go into this activity?

- [1] Skills easy to acquire
- [2] Little capital required
- [3] Most convenient
- [4] Feminine activity
- [5] Other (specify) \_\_\_\_\_

37. What fish processing assets do you own?

Asset	No.	Cost	Year of acquisition
Smoking kiln			
Drying rack			
Frying oven			
Salting vat			
Basket			

38. What quantities of fish do you handle in a week?

Species	Quantities handled (Kgs)	Buying prices Shs/Kg	Selling Prices Shs/Kg
Nile perch			
Tilapia			
Rastrineobola			
Others			

39. How many workers work on the unit and how are they paid?

	Number		Amount paid (Shs/week)
	Male	Female	
Workers with own fish			
Labourers with no fish			
Family helpers			
Other workers			

40. What other inputs do you use and what are their costs?

Type of Input	Quantities per week (Kgs)	Price per Unit (Shs)
Firewood		
Salt		
Oil		

41. How many days a month do you operate? \_\_\_\_\_

42. How many hours per day does the processing last? \_\_\_\_\_

43. What do you consider a low, average or high volume of processing activity?

43a. Low: \_\_\_\_\_ Kgs/week

43b. Average: \_\_\_\_\_ Kgs/week

43c. High \_\_\_\_\_ Kgs/week

44. Indicate the level of fish processing during the different months of the year:

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Level of processing												

*Levels given as: Poor[1] [2] [3] Good*

45. To whom do you sell your fish products?

[1] Consumers directly

[3] Retailers at another market

[4] Bicycle traders

[5] Truck traders - domestic

[6] Truck traders - regional export

[7] Others: (specify) \_\_\_\_\_

#### **D. Fish trade**

46. What type of fish trader are you?

[1] Factory agent - Nile perch

[2] Factory agent - Mukene

[3] Bicycle trader

[4] Landing-side trader

[5] Truck trader - domestic market

[6] Truck trader - regional export

[7] Fish factory

[8] Other (specify) \_\_\_\_\_

47. What fish trading assets do you own?

Asset	No.	Cost	Year of acquisition
Weighing scale			
Trucks			
Pick-ups			
Motorcycle			
Bicycles			
Boxes/baskets			
Platform			

48. What quantities of fish do you handle in a week?

Species	Quantities handled (Kgs)	Buying prices Shs/Kg	Selling Prices Shs/Kg
Nile perch			
Tilapia			
Rastrineobola			
Others			

49. How many workers do you use and how do you pay them?

	Number		Amount paid (Shs/week)
	Male	Female	
Workers with own fish			
Labourers with no fish			
Family helpers			
Other workers			

50. What other inputs do you use and what are their costs?

Type of Input	Quantities per week	Cost per Unit
Fuel		
Ice		
Wrappings		
Preservatives		

51. How many days a month do you operate? \_\_\_\_\_

52. What do you consider a low, average or high volume of fish trading activity?

52a. Low: \_\_\_\_\_ Kgs/week

52b. Average: \_\_\_\_\_ Kgs/week

52c. High \_\_\_\_\_ Kgs/week

53. Indicate the level of fish trade during the different months of the year:

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Level of trade												

Levels given as: Poor[1] [2] [3] Good

#### E. Economic issues

54. Do you keep books of accounts on your fish work?

[1] Yes

[2] No

55. If Yes, what books?

[1] Ledger books

[2] Dairies

[3] Exercise books

[4] Other

56. If No, why?

- [1] Not interested
- [2] Fear of taxes
- [3] Unable to write the books
- [4] Lack of time
- [5] Other (specify) \_\_\_\_\_

57. How did you raise the capital for the activity?

- [1] Owner's savings
- [2] Loan from fish trader
- [3] Loan from credit institution
- [4] Contributed by owner and labourers
- [5] Family capital
- [6] Other

58. How much do you earn from fish work per week?

- [1] In a good week      Shs \_\_\_\_\_
- [2] In a bad week        Shs \_\_\_\_\_

59. What is your approximate household consumption expenses per week? Shs \_\_\_\_\_

60. What assets and other items of wealth do you own?

Item	No	Value
Iron roof house		
Land		
Vehicle		
Bicycle		
Cattle		
Goats		
Radio		
Other		

61. Have you obtained any credit for your activities over the last three years?

- [1] Yes
- [2] No => go to Qu. \_\_

62. If Yes, give the information as below:

Source	Amount (Shs)	Duration (months)	Purpose	Amount repaid
Bank				
Poverty Alleviation Project (PAP)				
<i>Erandikwa</i> (seed money) scheme				
EDF Micro-projects programme				
Middlemen				
Private individual				
Other				

63. What problems did you experience with the credits?

- [1] Credit too little
- [2] Period too short
- [3] Interest too high
- [4] Occurrence of calamity
- [5] Other
- [6] None

64. How do you perceive the future for fish work? Poor [1] [2] [3] Good

65. On what factors do you base your perception?

- [1] High earnings
- [2] Reliability
- [3] Job security
- [4] Dignity
- [5] Other (specify) \_\_\_\_\_

66. What are the risks, uncertainties and threats associated with your fish work?

66a. Threats

- [1] Theft
- [2] Drowning
- [3] Wild animals
- [4] Moonlight
- [5] Other (specify) \_\_\_\_\_

66b. Risks and uncertainties

- [1] Heavy rains
- [2] Lightening
- [3] Floods
- [4] Unpredictable market
- [5] Other (specify) \_\_\_\_\_

67. How do you safeguard against them?

67a. Safeguards against threats

- [1] Patrolling
- [2] Life jackets
- [3] Day fishing
- [4] None
- [5] Other (specify) \_\_\_\_\_

67b. Safeguards against risks and uncertainties

- [1] Wearing black polythene bags
- [2] None
- [3] Other (specify) \_\_\_\_\_

68. Did you find it easy to enter into your kind of fish work?

- [1] Yes
- [2] No => go to Qu. \_\_\_

69. If Yes, why?

- [1] Capital required is small
- [2] Technology is simple enough
- [3] Laws and regulations not too restrictive
- [4] Required skills easy to acquire
- [5] Other (specify) \_\_\_\_\_

70. If No, why ?

- [1] Capital required is too high
- [2] Technology too complex
- [3] Laws and regulations too restrictive
- [4] Required skills not easy to acquire
- [5] Cultural hindrances
- [6] Other (specify) \_\_\_\_\_

71. Would you find it easy to quit your fish work?

- [1] Yes
- [2] No => go to Qu. \_\_

72. If Yes, why?

- [1] Equipment easy to dispose of
- [2] Alternative activities available
- [3] Other (specify) \_\_\_\_\_

73. If No, why ?

- [1] Equipment not easy to dispose of
- [2] Alternative activities not available
- [3] It is a family occupation
- [4] Other (specify) \_\_\_\_\_

74. If you quit your present type of fish work, which activity can you most readily move into?

- [1] Another type of fish work
- [2] Farming, related
- [3] Trading in other goods
- [4] Providing services
- [5] Cottage, craft
- [6] Others (specify) \_\_\_\_\_
- [7] None

#### **F. Social Issues**

75. Does your culture have any views that relate to fish work?

- [1] Yes
- [2] No => go to Qu. \_\_

76. If Yes, what are they?

- [1]
- [2]
- [3]
- [4]
- [5] Other (specify) \_\_\_\_\_

77. How have they affected your fish work?

- [1] Through better catch
- [2] Through better product
- [3] Through higher prices
- [4] Through lower costs
- [5] Through better storage
- [6] Through better management
- [7] Other (specify) \_\_\_\_\_

78. In which areas do you have knowledge and skill for fish work? (*tick up to 2*)

- [1] Fishing methods
- [2] Fish handling
- [3] Fish processing
- [4] Business management
- [5] Other (specify) \_\_\_\_\_

### **G. Other occupation**

79. Do you have other complementary activities to fish work?

- [1] Yes
- [2] No => *go to Qu.* \_\_

80. If Yes, what is the most important?

- [1] Farming, related
- [2] Trading in other goods
- [3] Providing services
- [4] Cottage, craft
- [5] Other (specify) \_\_\_\_\_

### **H. Extension services**

81. Do you receive extension services provided by Government or NGOs?

- [1] Yes
- [2] No => *go to Qu.* \_\_

82. If Yes, how frequently

- [1] Once a month
- [2] Once in three months
- [3] Once in six months
- [4] Once in one year
- [5] Other (specify) \_\_\_\_\_

83. What areas does the extension cover? (*tick up to 2*)

- [1] Fishing methods
- [2] Fish handling
- [3] Fish processing
- [4] Business management
- [5] Other (specify) \_\_\_\_\_

84. Give your assessment of the extension received: Poor[1] [2] [3] Good

### **I. Research**

85. Are you familiar with the areas in which fisheries research has been done?

- [1] Yes
- [2] No => *go to Qu.* \_\_

86. If Yes, which areas?

- [1] Fish resources
- [2] Fish production
- [3] Fish processing
- [4] Fish marketing
- [5] Other (specify) \_\_\_\_\_

87. Give your level of satisfaction with the research work: Poor[1] [2] [3] Good

## **J. Development projects**

88. Are you aware of the areas in which development projects have been done?

- [1] Yes
- [2] No => go to Qu. \_\_

89. If Yes, which areas?

- [1] Fish resources
- [2] Fish production
- [3] Fish processing
- [4] Fish marketing
- [5] Community development
- [6] Other (specify) \_\_\_\_\_

90. Name the project: \_\_\_\_\_

91. Give your level of satisfaction with the development projects: Poor[1] [2] [3]Good

## **K. Fisheries management**

92. Are you familiar with the fisheries management laws and regulations?

- [1] Yes
- [2] No => go to Qu. \_\_

93. If Yes, which areas are covered? (*tick all mentioned areas*)

- [1] Juvenile fish size restrictions
- [2] Gear type restrictions
- [3] Fishing method regulations
- [4] Fishing time regulations
- [5] Boat size regulations
- [6] Other (specify) \_\_\_\_\_

94. Give your opinion on the suitability of these laws and regulations for fisheries management.

- Poor[1] [2] [3] Good

## **L. Policies**

95. Have Government policies affected your fish work?

- [1] Yes
- [2] No => go to Qu.

96. If Yes, which policies?

- [1] Investment promotion
- [2] Liberalisation
- [3] Privatisation
- [4] Decentralisation
- [5] Other (specify) \_\_\_\_\_

97. How have the policies affected your fish work?

- [1] Through higher catch
- [2] Through bigger sized fish
- [3] Through higher prices
- [4] Through lower costs
- [5] Other (specify)

Thank you for your time and responses.

Appendix 2: LIST OF DATA COLLECTION SITES

<b>Cluster</b>	<b>District</b>	<b>Landing Sites</b>	<b>Markets</b>
Low Income	Bugiri	Matiko	Kyotera Kalisizo
		Bulosi	
		Maluba	
		Wakawaka	
	Iganga	Musoli	
		Bwondha	
		Namadhi	
		Musubi	
	Rakai	Kasensero	
	Kalangala	Sango Bay	
		Kibanga	
		Kachungwa	
		Buyange	
		Kisaba	
		Misonzi	
		Nakalanga	
		Nakirimira	
Kabbuka			
Medium Income		Mukono	Namasale
			Kasirye
			Kigugo
			Namazina
	Lingira		
	Banga		
	Walwada		
	Kyanamu		
	Kitamiro		
	Kirongo		
	Luffu		
	Lukale		
	Yuwe		
	Nambula		
	Gombolola		
	Kiyindi		
	Koko		
Senyi			
Shauriyako/			
Mpigi	Bugoba		
	Buwangajo		
	Kalega		
	Paradise		
	Busabala		
	Nangombe		

<b>Cluster</b>	<b>District</b>	<b>Landing Sites</b>	<b>Markets</b>
	Masaka	Kagulube Nakabugo Buganga Bwerenge Kachanga Bugiri Musiisi Dimu Lambu Nakiga Kamunga Kalangala	Ntendo Kitengesa Kimanya Kirimya Masaka Katwe Kinoni Kyabakaza Lukaya
High Income	Busia	Nalyoba Busime Butangasi	
	Jinja	Masese Wanyange	
	Kampala	Ggaba	Kibuye Katwe Nakivubo Nakulabye Shauriyako Kalerwe Busega Kitimba Nakawa Owino