

**CAPABILITY AND LEGITIMACY OF BEACH MANAGEMENT UNITS (BMU'S)  
TO IMPROVE FISHER'S INCOME THROUGH MANAGEMENT OF FIRST-  
HAND SALES SYSTEM IN LAKE VICTORIA - TANZANIA**



Master thesis in International Fisheries Management  
(30 credits)

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### **Cover picture**

Showing fishers and the building of Ihale beach where fish sales are always undertaken, BMU committee, fisheries manager of Magu district and writer of the thesis in a focus group discussion. The picture was taken during fieldwork in July 2007.

## Acknowledgements

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## **Dedication**

This work is dedicated to my daughters Rachel and Elizabeth.

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## Abbreviations and Acronyms

BMU	Beach Management Units
CBO	Community-Based Organization
COLMR	United States, Department of Veterans Affairs, Centre for Organization, Leadership and Management Research
CIFA	Committee for Inland Fisheries of Africa
CPUE	Catch per Unit Effort
DRC	Democratic Republic of Congo
DFID	United Kingdom, Department for International Development
DAC	Development Action Committee's
DC	District Commissioner
DED	District Executive Director
EU	European Union
EAFRO	East African Freshwater Fisheries Research Organization
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
LVFO	Lake Victoria Fisheries Organization
LVFRP	Lake Victoria Fisheries Research Project
MNRT	Ministry of Natural Resource and Tourism
NGO	Non-Governmental Organization
OECD	Organization for Economic and Development
SNV	Netherlands Development Organization
SLA	Sustainable Livelihood Approach
SFLP	Sustainable Fisheries Livelihoods Programme
TAFIRI	Tanzania Fisheries Research Institute

## **ABSTRACT**

Depending on the particular institutional and organizational set-up, different management tasks can be suitable for different forms of co-management arrangement. This thesis focuses on examining the possibility of implementing the marketing-oriented fisheries co-management in Lake Victoria (Tanzanian side) for Nile perch fisheries. The community-based organization BMU was selected as fisher's representative organization in order to investigate how it is possible to improve the fisher's market performance and reduce poverty in that fishing community. The findings of this study indicated that the globalization of Nile perch fishery has attracted number of actors to join the fishery and among of them are middlemen, processing plants and fishers themselves. The current first-hand sales system has greater contribution on poverty situation to the majority fishers and made few players benefits over resource, especially investors of the fish processing plants and the fish agents. The deliberate ignoring to identify and incorporate the problems, needs and opportunities that exist in the fishing communities under the co-management arrangement has made the fishers community less motivated in the participation of resource management activities. Fight for better fish prices and issuing of credits to fishers were the most prioritized first-hand sales activities that proposed by fishers community to be undertaken by the BMU organization. Capacity building for the BMU is highly needed in order for the organization to undertake its responsibilities efficiently and effectively. Theories used in this study include the poverty theory, co-management, SLA and middlemen theory.

Key words: Co-management, first-hand sales, poverty, BMU's, Tanzania

## Chapter one

### INTRODUCTION

#### 1.1 Research background

Most of the world fisheries today are either overexploited or in a state of full exploitation because of greater fishing effort and increased competition between fishers, vessels or nations over the resource. National governments, development agencies and development practitioners and scholars around the world are working hard on how best to manage the fisheries resources without compromising the biological, economic and social objectives for the benefit of present and future generations.

The co-management approach is one of the fisheries management tools which has received much attention with the belief that co-management leads to efficient fisheries management by involving fishing communities in the decision making process and management of the resources.

In Tanzania, the co-management regime has been implemented through the establishment of Beach Management Units (BMUs). A BMU is a community-based organization which is legally accepted as a representative of a fishing community regarding fisheries resource utilization and management. Around Lake Victoria 433 BMUs were formed and they work in collaboration with the relevant government authorities concerned with fisheries management. The primary goal of this partnership is the management of the resources where government entered into an agreement with the BMUs on the protection and sustainable utilization of the fish resources.

The globalization of fish trade has promoted the Lake Victoria fisheries from a traditional to a commercial fishery. There is a continuous increase in the number of fishers and their fishing gears, as evidenced in the frame survey report of year 2006, in response to the increased demand for fish in the fish processing plants.

Despite the commercialization of the fish trade, living conditions of the fishing communities in the Lake Victoria region do not differ from other fishing communities in

developing countries where the majority of the population are poor. To address the problems, a survey was carried out in these fishing communities between January and March 2001 in the three regions bordering the lake on the Tanzanian side in order to understand how fishers conceptualize their conditions. The findings of this survey indicated that fishers are not in control of their natural resources; in addition they are not in any way organized in relation to the sales of their fish and therefore are highly exploited by middlemen who link them with the fish processing plants.

This thesis will present and demonstrate the need for a market-oriented fisheries co-management regime for the sustainability of the BMUs and the improvement of the fishing communities along Lake Victoria (the Tanzanian part). This is in line with what has been proclaimed by Béné (2003):

*“The social and institutional mechanisms which take place within and around the fisheries play a very important role in the maintenance, alleviation or aggravation of poverty in fisheries-dependent communities.”*

## **1.2. The research problem**

Despite worldwide efforts in finding possible solution for the management of the marine resources, the state of the resources in developing countries continue to deteriorate and the living conditions of fishers are still poor. The use of destructive fishing methods and lack of adherence to fisheries regulations still persist to a large degree. In Lake Victoria the use of under-sized mesh gillnets and beach seines keep increasing as has been shown in the 2006 frame survey report (Appendix 1).

Relatively few fish traders and fish processing plant investors continue to benefit from the resources while the majority of local fishers have little or no influence. Efforts towards the exploitation of the resource continue to rise in response to the scarcity of fish due to over-exploitation and less income realized from harvesting.

Pomeroy (1995) noted that only an empowered community can address both the need for economic development and the conservation of natural resources. The sustainability of

community-based organization like BMUs and the active participation of the fishing communities in resource management will depend to the perceived benefits of the organization to its members. While the overall goal of co-management in fisheries, particularly in developing countries, is to get the community to participate in resource management and having sustainable fisheries as a benefit of this partnership. This benefit can not be seen directly to fishing communities like in Lake Victoria, where there is a serious problem of poverty since currently such partnership has no direct impact on their daily income from fisheries they depend on.

The co-management approach at the Lake Victoria (Tanzania) should be integrated with market issues like management of first-hand sales in order to increase the market performance of fishing communities which in turn will lead to improved income and standard of living. With market- oriented fisheries co-management arrangements, fishers will actively participate in resource management since they will be no longer be fishing as an employment of last resort as their organization (BMUs) will struggle and lead for better business environment and improved fish prices.

This also was highlighted by Hara and Nielsen (2003), claiming that achieving sustainable exploitation of fisheries in most water bodies in Africa is likely to be part and parcel of the broadening of economic opportunities and general economic development in concerned rural communities.

### **1.3. Research questions**

The study aims at finding out the current performance of the BMUs in management of fisheries resources and what necessary conditions and resources are required for BMUs in order to undertake the additional responsibility of management of first-hand sales at Lake Victoria (Tanzanian side). In achieving the overall objectives, the thesis is focussing on answering the following research questions:

- What activities are currently performed by the BMUs?
- What are the BMUs' strength and weaknesses?
- What can be done to improve the BMUs' performance?

- What is the current first-hand sales system and who are the key players?
- What could be done by the BMUs in order to improve the first-hand sales system?
- What are the government's and the fish buyers' opinions on the first-hand sales regulations?

#### **1.4. Research method**

The research is based on both primary and secondary data, with great emphasis on primary data. Focus group discussions were conducted in the gathering of primary data at community level. Respondents were grouped according to their roles in fishing activities and in BMU organization where 6 to 15 respondents were prioritized. Prior to the fieldwork, interview guide questions were developed in consultation with my research supervisor.

Key informant interviews of fisheries managers, leaders of fish processing plants and some leaders from government local authorities were also conducted. These people are very familiar with the BMUs, and changes that happen to the organization and fisheries of Lake Victoria in general.

Secondary data were obtained from fisheries authorities and on internet for the Tanzanian fisheries in general and the Lake Victoria fisheries in particular. A literature review on the co-management experience in managing inland fisheries resources, challenges and prospects for market oriented fisheries co-management, and factors for sustainability of community based organization, was also conducted.

#### **1.5 Research area and respondents**

The Lake Victoria basin in Tanzania side is subdivided into three riparian regions; Mwanza, Mara and Kagera. The research conducted covers only on one region Mwanza, and ten beach management units (BMUs) were visited from three districts (Ilemela, Magu and Misungwi).

Ten focus group discussions were conducted from each group of respondents at the community level. These groups were BMU committees, fishers (boat owners & crews), and fish traders. Key informant interviews were conducted to 19 respondents, as follows: 3 representatives of processing plants, 4 fisheries officers and 12 village leaders. The number of village leaders was very high compared to other respondents because some BMUs involve more than one village as its area of jurisdiction. Under BMUs' national guidelines, beaches with less than 30 boats were disqualified to form BMUs. To qualify for that some beaches were joined with neighbouring beaches, where fishers happened to be from another village or island.

### **1.6 Limitations of the study**

Lake Victoria has a surface area of 68,800km<sup>2</sup> where 56 % of the total area is owned by Tanzania. The lake has more than 500 beaches and out of that 433 BMUs were formed. Due to limited time only 10 BMUs were covered. The information generated will not be statistically significant because of a small sample size and this may have an effect on some of the findings of the thesis.

The focus group discussion method used in gathering information from fishing communities was challenging, since it was difficult to make prior selection of respondents. In all beaches I started with those who were willing to participate in discussion with the help of a fisheries officer responsible at the beach to convince them to attend the discussion. This made me spend a lot of time at the beach waiting for respondents, although one day allocated for each beach was sufficient.

During the discussions, in making the fishers understand the purpose of the research some were confused and thought I went for sensitization and kept asking many questions instead of responding to my questions which also consumed much of my time.

The sampling of the BMUs was based on past information of BMUs' performance before the reformation and fish trade development at the beach. The selection resulted in the dominance of Nile perch trade information and says little about other species available in

Lake Victoria, and because of that my thesis is concentrated on the Nile perch fisheries only, also when dealing with the selling system and regarding what BMUs can do to improve the selling system situation.

### **1.7 Outline of the thesis**

The thesis constitutes eight chapters. The background information and methodological aspects of the research are covered in *chapter one*. The chapter first give details about the state of the world's fisheries resources and the adoption of the co-management approach, the development of fish trade at the Lake Victoria and sales practices as basis for the poor income obtained by the fishers. Furthermore the chapter continues by explaining the methodological aspects, especially of how the fieldwork was conducted and it also gives the scope of the research by describing the research problem, research questions and the limitations of the study.

The background information of Tanzanian fisheries is given in *chapter two*, with focus on the Lake Victoria fisheries where the fieldwork was conducted. Information about ecology and species diversity of Lake Victoria, the status of the Nile perch fisheries and its fishing operations are given. Fish production, processing and marketing, and management issues at Lake Victoria are also discussed. *Chapter three* gives detailed explanation of the methodology applied in the study, explanation on how the research proposal was developed, methods used to collect both primary and secondary data, sample size and validity and limitation of the study are given.

Theories that relate to the study are covered in *chapter four*. Theories of co-management and how this is implemented in Tanzania, poverty, the sustainable livelihoods' approach and the role of middlemen are discussed in detail in relation to the research topic chosen. The material presentation is covered in chapters five and six. Information about the BMUs' reformation and their current performance, strength and weakness of the organization, and their capability in resource management are discussed in *chapter five*. The chapter also gives suggestion on what should be done to improve the organization's performance. In *chapter six*, information about the existing first-hand sales system and its problems at Lake



Victoria, and the capability and aspiration of the BMUs to improve the first-hand sales system are discussed. *Chapter seven* offers a discussion of the results in relation to the theories outlined in chapter four while *chapter eight* gives the conclusions and recommendations of the thesis.

## Chapter Two

### BACKGROUND INFORMATION

#### 2.1. Tanzania: geographical and demographical conditions

Tanzania is located in Eastern Africa between longitude 29° and 41° East, Latitude 1° and 12° south. The country is bordered by Kenya and Uganda on North, Rwanda, Burundi and the Democratic Republic of Congo in the west, Zambia, Malawi and Mozambique in the south, and the Indian Ocean in the East. The total area of the country is 945,090 km<sup>2</sup> made up of 26 administrative regions and 130 districts. The country has a spectacular landscape featured by physiographic regions of islands, and coastal plains to the east, an inland saucer-shaped plateau and the highlands. The population of the country is more than 34 millions people with growth rate of 3 % per annum; and 50 % of the population is believed to live below the poverty line.<sup>1</sup>

#### 2.2. The fisheries profile of Tanzania

Tanzania is one of the largest fisheries nations in Africa. The country is endowed with both marine and freshwater fisheries. It shares the largest inland lakes in Africa, which include Lake Victoria, Lake Tanganyika and Lake Nyasa; and also have the Indian Ocean coastline, rivers and wetlands.

The potential yield of fish from natural waters is estimated to be 730,000 metric tons with a present catch of over 350,000 metric tons annually<sup>2</sup>. The sector is dominated by the artisanal Nile perch fishery from Lake Victoria, both in terms of volume, landed value, export revenue and government tax revenues and followed by the shrimp fishery from marine shallow water (Wilson 2004). Fish production from the Lake Victoria is about 500,000 metric tones annually with Tanzania producing an average of more than 200,000 tonnes, equivalent to 40 % of the total catch of the East African region; which also

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<sup>1</sup> <http://www.tanzania.go.tz>

<sup>2</sup> <http://www.fisheries.go.tz>

constitutes about 60 % of the annual production in the capture fisheries of the country. The contribution of the sector to the national GDP is about 3 % per annum and the sector employs about 300,000 people as permanent and temporary fishers (FAO 2002).

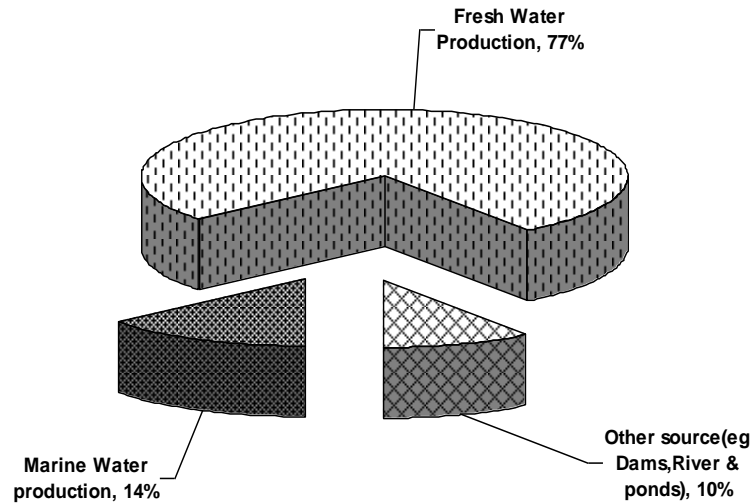


Figure 1: Comparison between total marine, major lake, and other sources of fish production in percentage-1990-2003

Source: FAO FISHSTAT & Fisheries Department

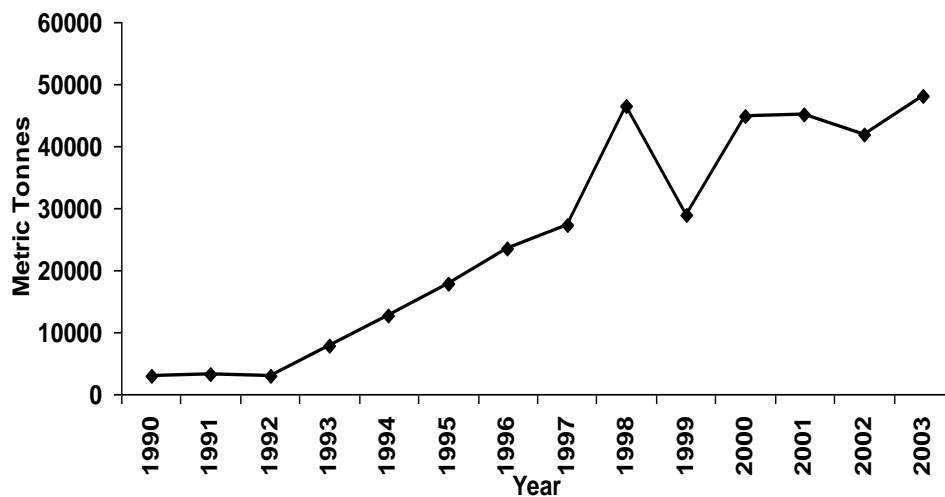


Figure 2: Export quantity of fish and fish products in Tanzania from 1990-2003

Source: FAO FISHSTAT & Fisheries Department

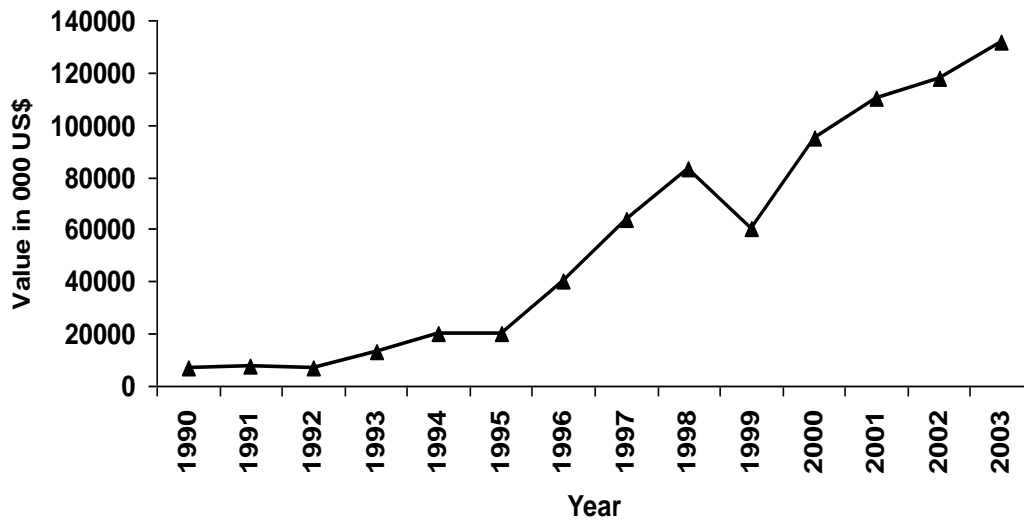


Figure 3: Export value of fish and fish products in Tanzania from 1990-2003

Source: FAO FISHSTAT & Fisheries Department

Mangrove forests and estuarine ecosystems play a significant role in both finfish and shellfish fisheries in marine waters. The major prawn fishing grounds are in Kisiju, Rufiji, Sadani and Bagamoyo (influenced by Ruvu and Wami Rivers). Prawns are harvested at a depth of between 1 and 15 m and during high tides, prawn trawlers operate within a kilometre of the shore.

The freshwater fishery is divided into two major categories; the large water bodies which include the Great Lakes (Victoria, Tanganyika and Nyasa), Lake Rukwa, Nyumba ya Mungu Dam and Mtera Dam; and the minor waters bodies which include all small water bodies in different regions and rivers like Pangani, Rufiji, Ruvuma, Wami, and Ruvu rivers.

Fisheries resource in mainland Tanzania is managed by the Fisheries Department, subordinate to the Ministry of Livestock and Fisheries. Before 2008 it was the Ministry of Natural Resource and Tourism (MNRT). Under the decentralized administrative structure; all fisheries and aquaculture issues at district level are the responsibilities of district fisheries officers who sort under the local District Council.

### 2.3. Lake Victoria ecology and its species diversity

The Lake Victoria is the second largest lake in the world shared between three riparian countries; Tanzania (51 %), Uganda (43 %), and Kenya (6 %). The lake covers a surface area of 68,800 km<sup>2</sup> and the adjoining catchment area of 193,000 km<sup>2</sup> spanning to Rwanda and Burundi. The lake is relatively shallow with an average depth of 40 meters and maximum of 96 meters in the northeast (Mgaya, 2005).

The lake has been supporting a number of endemic fish species of more than 28 genera which comprised about 350 species once encompassed the fish fauna. The cichlids were a dominant group of species accounting for about 300 *Haplochromis* species and two tilapiine species (Greenwood 1974; Witte et al.1992; Graham 1929).

It has been documented that the fisheries of Lake Victoria developed with little effort using simple fishing gears around the inshore water. And the introduction of gill nets in the Nyanza (Kavirondo) Gulf in 1905 (Graham, 1929) and beach seines in the early 1920s perpetuated the fishing pressure. Investment in infrastructure opened inland markets and promoted fishing industry developments. Increased fishing pressure resulted into decreased catch per unit effort especially for tilapiines and *Labeo victorianus* in the 1950s (Worthington and Worthington 1933; Cadwalladr 1965; Fryer 1973). Other species like *Barbus altianalis*, *Tilapia esculentus*, *Tilapia variabilis* and *Mormyrus kannume* were also noted to be rare in the catches (Garrod 1961).

Efforts to develop and manage the fisheries of Lake Victoria started in the 1950s when signs of overfishing were recorded and this resulted in the introduction of exotic species to boost the fish production. *Tilapia melanopleura*, *Tilapia zillii*, *Oreochromis leucostictus* and *Oreochromis niloticus* were therefore introduced in the lake (Welcomme 1968). Nile perch (*Lates niloticus*) was also introduced in the late 1950s and early 1960s (Arunga 1981; Welcomme 1988). The effect of the introduced exotic species in the fishery was not immediately realised. Catch rates and the total yield kept decreasing for the next twenty years.

A lake-wide bottom trawling fishing survey conducted in 1969/1971 revealed that haplochromines contributed 80% of the demersal fish biomass of Lake Victoria (Kudhongania and Cordone 1974); however in the 1980s an explosive increase of *Lates niloticus* stocks occurred. The total catch of fish increased from about 100,000 tons in 1979 to about 500,000 tons in 1989 and the annual production has remained at a higher level than what was achieved during the late 1960s and 1970s (Jansen 1997).

As Nile perch was increasing in the catches even up to 90% of the total catch; the other species were decreasing (Ligtvoet & Mkumbo 1992). In 1989, bottom trawl surveys showed haplochromines to have almost disappeared in the catches (Witte et al. 1992), a fact which ecologists termed as an *ecological disaster*.

Currently the fishery in the lake has been transformed from multi-species fisheries into three major commercial species; which includes *L. niloticus* (Nile perch), the tilapias (mainly *O. niloticus*, 'sato') and *Rastrineobola argentea* ('dagaa'). Apart from introducing exotic species, increased eutrophication and waste runoff contributed into the changes of species diversity of the lake (Maembe 2003)

The *Lates niloticus* dominate the catches but its size continue to decrease and the catches are characterized by dominance of small and juvenile Nile perch, with the majority of the *Lates niloticus* being below 50 cm TL (lower limit of slot size) with over 90 % of the abundance by numbers being juveniles (Mlaponi et al. 2008).

#### **2.4. Fish production and status of Nile perch fishery in the Lake Victoria**

As stated above, the fish production of the Lake Victoria is dominated by artisanal fishers and the lake contributes up to 60 % in annual production of capture fisheries in the country and equivalent to 40% when compared with partner states. According to the frame survey of 2006 (Appendix 1), there are more than 98,000 fishers that are permanently involved with harvesting of lake resource on the Tanzanian side.

Since mid 1980s the production trend has potentially increased although not stable; in the late 1990s and early 2000s the fish production increased at a decreasing rate and catches were mostly dominated by three species of high commercial value; *L. niloticus* (Nile perch), the tilapias (mainly *O. niloticus*, 'sato') and *Rastrineobola argentea* ('dagaa') (Onyango 2007).

Figure 4 below shows the estimates of fish production of Lake Victoria from 1958-2004. The statistical data are more reliable up to 1990s when fisheries officers themselves were responsible for taking such data while afterwards it is based on estimates of average catch per boat landed.

The catch per unit effort (CPUE) of Nile perch showed to increase since the start of this fishery in late 1980s when the highest value was in 1995 of 19.22 mt /boat/year and decrease to 16.07 mt /boat/year in year 2000, indicating the declining stock size (Sobo 2005). This is also evidenced from the decline of mean standing stock of Nile perch from 1.29 million tonnes in 1999/2001 to 0.82 million tonnes in 2005/2006 from surveys conducted by the fisheries research institutes of partner states sharing the Lake Victoria resource<sup>3</sup>

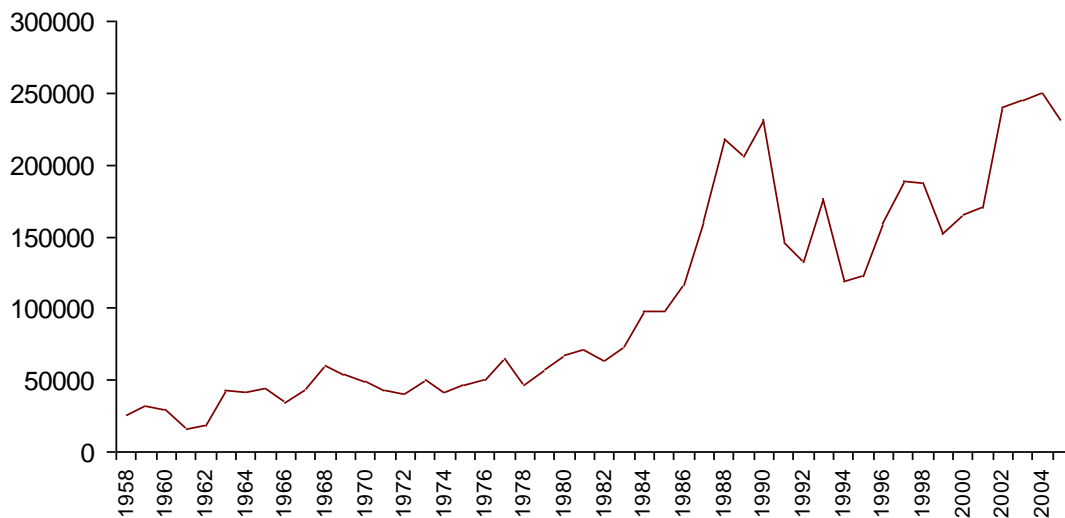


Figure 4: Lake Victoria-Tanzania fish production (Adopted from Onyango 2007)

<sup>3</sup> <http://www.lvfo.org> State of fish stock

## 2.5. Fishermen and fishing gears in Lake Victoria

### 2.5.1 Fishermen's demographic conditions

The age distribution of fishermen at Lake Victoria ranges between 12 years old to 79 years. This has been shown from several studies undertaken in fishing communities. The age structure of fishing communities are almost equal to the population structure of the overall country where 53.2 % of the population fall in the age structure of 15-64 years of age for both men and women<sup>4</sup>.

Most fishers at Lake Victoria (Tanzanian side) have acquired primary education and few have not attended school at all. On the other hand very few fishers have managed to get a college education. From baseline surveys conducted in 2005 we know that the few fishers with higher education are primarily boat owners, fish traders or processors. The table below shows that fishers joining the fishery with primary education kept changing from 66 % in year 1993 to 80 % in year 2000s. The education level is a very important element in understanding what kind of capacity building is needed to support the co-management arrangement at community level.

Table 1: Education level of fishers

Reference	Leendertse 1993 Kagera	Kulindwa 2001	Kisusu& Onyango 2004	Kilosa et al 2005	Muro et al 2004
<b>Various level</b>	<b>Percent</b>				
Primary	66	82.4	82.1	88	70.8
Secondary	12	12.3	11.2	12	7.1
College	1	0.5	0.4	0	1.6
No schooling	11	4.6	6.3	0	20.5
Informal	0	0.2	0	0	0

Source: Onyango (2005) in Mgaya synthesis report (2005).

<sup>4</sup> <http://athaia.org/tanzania-population.html>



### **2.5.2 Fishing operations and gears in Lake Victoria**

Generally fish in Lake Victoria are captured by gill nets (Appendix 1) usually 4" to 5" mesh, and these gears are set in water of less than 20 m depth. The majority of fishers set the nets in the evening, leaves them overnight and hauls them the next morning (Bwathondi 1991).

Beach seines, although they are illegal because of their destructive nature are still popular along the sandy shore of the lake. The seine is set in less than 5 m of water and hauled in within a few hours. Catches include adults and juveniles of most shallow water species. There are large seine nets whose operations take up to 8 hours from setting to retrieving. Traps are usually set in rivers, marshes and close to the shoreline. Those set in the rivers and marshes capture riverine fish which spawn in the rivers but grow and feed in the lake (potamodromous fish) or those which spawn in the lake but feed in rivers (Bwathondi *et al*, 1991). The most common genera found in the rivers and marshes of Lake Victoria include *Labeo victorianus* (Ningu), *Schilbe intermedius* and *Protopterus aethiopicus*. Capturing of these fish, especially at breeding time during the rainy season, has contributed substantially to their decline in the lake.

Simple crafts which include wooden canoes, catamarans, and rafts are boats that are commonly used in Lake Victoria. Most use inboard or outboard engines, or paddle and sail as a means of propulsion.

### **2.6. Fish processing and marketing in Lake Victoria**

Fish processing and marketing in Lake Victoria can be divided into two; artisanal and industrial processing and marketing. Industrial processing is mainly concerned with processing and marketing of Nile perch products and export to international/overseas markets while artisanal processing and marketing mainly deals with all species currently found in the lake with greater focus on Dagaa, tilapia and Nile perch by-products and fish rejects from industrial processing plants, and sold to local and regional markets. The artisanal processing involves smoking, sun drying, salting or deep frying, and the preference of fish products has much influence on the form of processing. Locally fresh

fish is mostly traded at the beach while other inland markets prefer the above mentioned processing methods which can preserve the fish to have a longer shelf life.

Nile perch is the most exported commodity with several kinds of products; including belly flaps, fish meal, fillets, fish chest, fish frames, fish maws, fish offals, fish skin, head and gut, Nile perch chips, Nile perch steak, off-cuts, fish oil, Kayabo, dried fish and Nile perch carcass (Onyango 2005). The figure below shows seven Nile perch products from the above mentioned lists and dagaa are most exported to regional markets and its processing are done at small-scale level. Regionally Rwanda, Burundi and Kenya are the major importers of Dagaa, and the Democratic Republic of Congo (DRC) is a major importer of Kayabo/salted fish and a small quantity is exported to Burundi.

The other products are mostly exported to international markets where exports of fillets usually dominate in terms of weight. The international markets involve countries of the European Union (EU), the Middle East, Australia, Asia, and other countries of Africa and America. The quantity of exports to Europe exceeds all other areas except in year 2000 when exports to Africa were the highest (Figure 6). It is estimated that a total consumption of Nile perch in the EU are 600-800 tons of fillets per week (SNV 2006).

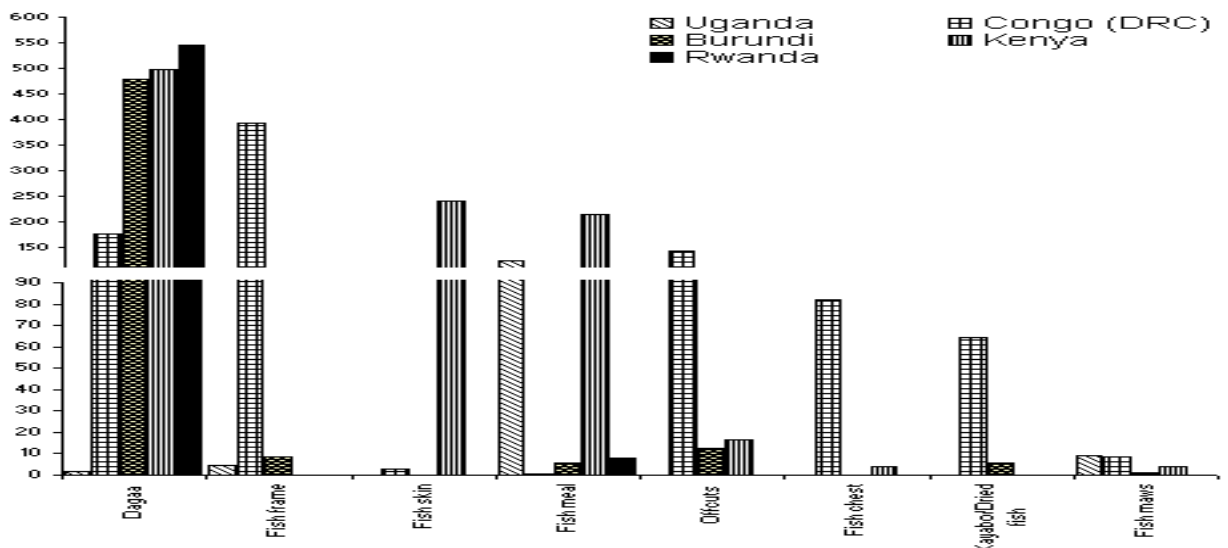


Figure 5: Comparison of exports in regional markets between 2005 and May 2006

Source: Onyango et al. (2006).

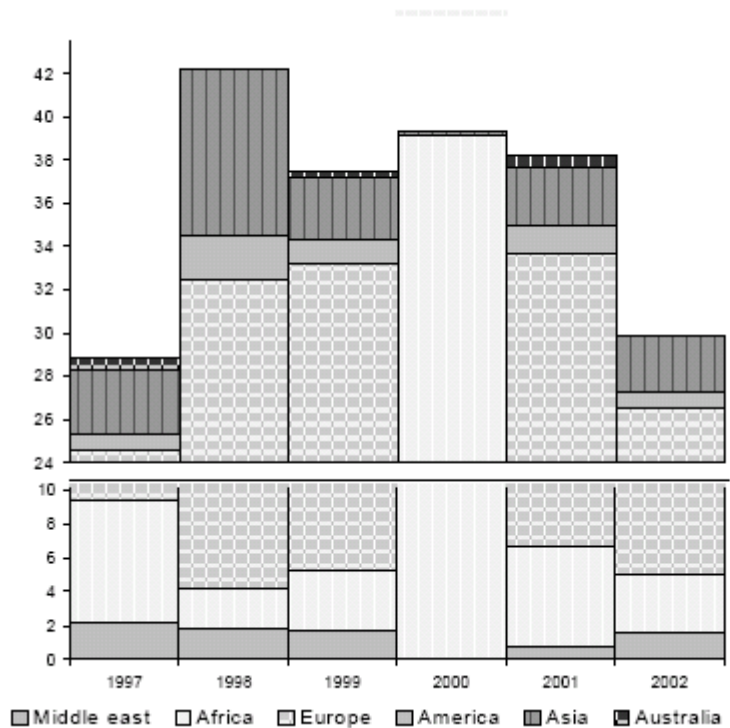


Figure 6: Comparison of export in international/overseas markets between 1997 and 2002

Source: Onyango (2005) in Mgya synthesis report (2005)

### 2.7. Management of the Lake Victoria Fishery

Efforts to manage the Lake Victoria fisheries started since the colonial period. Although by that time the colonial rulers considered fish as native food with little economic value and therefore management of the resource has little government intervention. In Tanzania by that time there was the Fisheries Ordinance and Trout Protection Ordinance (Tanganyika Territory, 1950) to control the fisheries of the Tanganyika Territory (Hoza et al. 2005).

The attempt to manage the Lake Victoria during colonial period can be seen from year 1933 when the regulation of minimum mesh size of 5 inches in gillnets was introduced. The regulation was established based on first research findings conducted by Graham (1929) which noted that the gillnet fishery which was first introduced in 1908 was negatively affecting the stocks.

Soon after independence efforts in developing and managing the fisheries started with the creation of the Fisheries Division in 1964; and it was followed by the enactment of the Fisheries Act No. 6 in 1970 which repealed and replaced the Trout Protection Ordinance. The fisheries division (under the Ministry of Natural Resource and Tourism) worked under the guiding management objectives “*to promote, support, guide and ensure proper management and optimum utilization of the fisheries and other resources of the aquatic environment for the benefit of the existing and future generations*”<sup>5</sup>.

The Fisheries Act no.6 worked with its succeeding regulations of 1973, 1989, 1994 and fisheries policy of year 1997 which emphasized the involvement of fishing communities in the management of the resources. Under this management regime the right to harvest fish resources was granted to individual fishermen, on an annual basis through a licensing system.

In 1998; due to environmental degradation resulting from the use of destructive fishing gears and methods, inadequately trained fisheries staff and budgetary constraints, the co-management approach was introduced, leading to the establishment of 500 BMUs around Lake Victoria (Onyango 2004).

These BMUs were further reformed in year 2006 due to a number of problems which hindered their performance. Lack of legal backing was among the problems which hindered the BMUs’ performance, and in order to accommodate different issues outlined in fisheries policy the Fisheries Act No. 22 of 2003 was amended on 13 November 2003 (Fisheries Division, 2004).

Under these fisheries Act No.22 BMUs’ roles and responsibilities are identified. Currently there are 433 BMUs newly reformed around Lake Victoria on the Tanzanian side with the overall objective of participating in resource management.

Other institutions that work in support of management of the fisheries resources are Tanzania Fisheries Research Institutes (TAFIRI) and Lake Victoria Fisheries

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<sup>5</sup> <http://www.fisheries.go.tz>

Organization (LVFO). TAFIRI is a parastatal organization established in 1980 with the role of conducting fisheries research and disseminating research findings to the government and other stakeholders. Prior to that, the fisheries research work has been undertaken by the East African Freshwater Fisheries Research Organization (EAFFRO) with its headquarter office located in Jinja, Uganda (Hoza et al. 2005)

The LVFO is a regional organization under the East African Community responsible for coordinating and managing the fisheries resources of Lake Victoria. The body was formed under the facilitation of the Committee for Inland Fisheries of Africa (CIFA) by signing the convention in 1994 by the three partner states; Tanzania, Kenya and Uganda. The objective of the organization is to foster cooperation among the partner states by harmonizing national measures, developing and adopting conservation and management measures for the sustainable utilization of aquatic resources of Lake Victoria for maximum socio-economic benefits.

An example of major fisheries regulation currently adopted by partner states is the slot size where under such regulation fishers are not allowed to fish and land a Nile perch of less than 50 cm or bigger than 85 cm. The regulation was formed based on research findings conducted by Lake Victoria Fisheries Project (LVFRP) which showed alarming information on deterioration of the sex ratio of Nile perch (Hoza et al. 2005).

## Chapter Three

### METHODOLOGY

#### 3.1 Fieldwork preparation

The preliminary stage of my fieldwork was very challenging; especially the research proposal development. My academic and working experience had a great influence in the choice of the research topic. I have a bachelor's degree in business management specialized in marketing and this together with a few studies conducted at the Fisheries Research Institute I am working with, helped me to understand some research gaps in area of processing and marketing of fish and fish products in the fisheries industry of Tanzania, specifically in Lake Victoria where I have my working station.

The applicability of co-management approach in first hand sales for fish and the implementation of co-management through the formation of BMUs in Lake Victoria also influenced me in the selection of the topic of my thesis. My assignment was to find out how this system of sales unions worked and it was very difficult because of few references in the literature. In order to broaden my knowledge regarding the topic, I took time and visited the Norwegian Fishermen's Association (Norges Råfiskarlag) in Tromsø and this helped me to understand what type of services they offered to the fishers in order to improve their benefits and rewards of the fisheries activities they depend on. Therefore in summary the fieldwork preparation involved the following activities:

- (i) Study and develop the research proposal
- (ii) Identify the fieldwork sites
- (iii) With assistance from my research institute, to write and distribute letters to all selected organizations, especially within fisheries management to inform them about the study and ask for their support to sensitize the fishers to participate actively
- (iv) Prepare essential technical equipments such as tape recorder, camera, transport, note books and accommodation.

Ilemela, Magu and Misungwi district of Mwanza region as shown in the Map (figure7) were chosen as fieldwork sites because of their accessibility and well developed landing sites for Nile-perch. Most of the fish processing plants in Lake Victoria (in the

Tanzanian part) are also located in the Mwanza region. The existence of active BMUs prior to the reformation which was undertaken in the year 2006 was also among the criteria for choosing these sites.

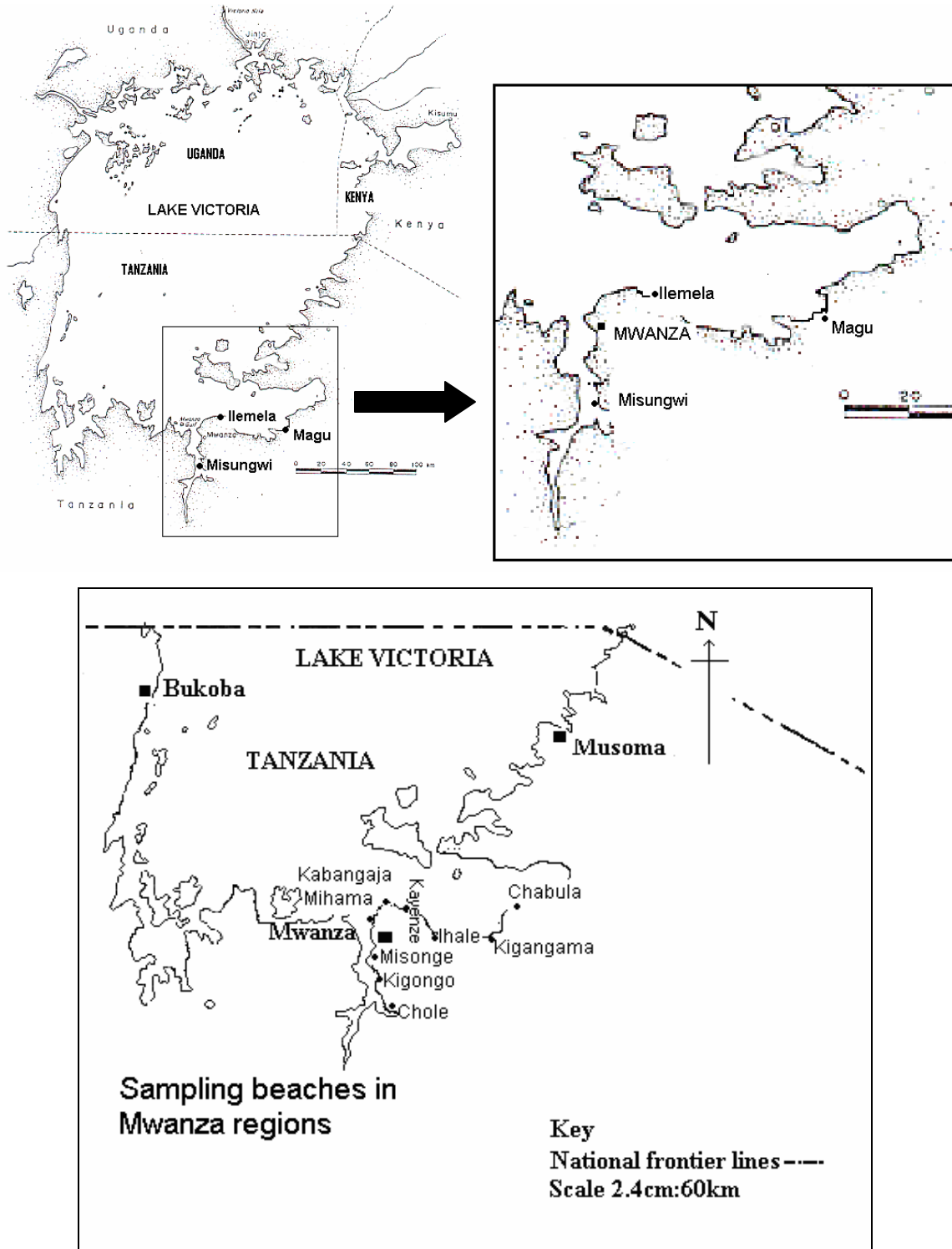


Figure 7: Map of Lake Victoria showing fieldwork sites in Mwanza region

## 3.2 Methods

As mentioned in the introduction of the thesis; the fieldwork conducted is mainly based on qualitative methods for data collection. Focus group discussions and key-informant interviews were methods mainly used for gathering primary data and secondary data was used to enrich the study.

### 3.2.1 Qualitative methods

Qualitative research methods are valuable in providing rich descriptions of complex phenomena; tracking unique or unexpected events, revealing experience and interpretation of events by actors with widely differing stakes and roles; giving voice to those whose views are rarely heard; conducting initial explorations to develop theories; and to generate and test hypotheses; and moving toward explanations.<sup>6</sup>

#### *(a) Focus group discussion*

This involved selecting groups of about 6 – 15 people who shared the same roles in fisheries activities and in BMU organizations, such as BMU committee members, fishers and fish traders for a discussion. A number of guided questions were used and during the discussion group members were free and spontaneously talked about the topic under my facilitation, assisted by a fisheries manager. The method was chosen because of its usefulness in obtaining in-depth information on concepts, perceptions and ideas of a group. In every beach chosen for fieldwork at least three focus group discussions were conducted. In some beaches where the number of fishers ready for discussion was large, like in Kigangama and Chabura in Magu district, I divided them into two groups (boat owners and crews) because it is believed that when crew members are together with their boat owners it is hard for them to participate freely in the discussion.

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<sup>6</sup>[http://www.colmr.research.va.gov/mgmt\\_research\\_in\\_va/methodology/qualitative\\_research.cfm#6](http://www.colmr.research.va.gov/mgmt_research_in_va/methodology/qualitative_research.cfm#6)



### *(b) Key-informant interviews*

Face-to-face interviews were conducted with community leaders and professionals such as fisheries managers, representative of fish processing plants, and village leaders believed to possess first hand knowledge about the Lake Victoria fisheries. The purpose of key informant interviews is to collect information from a wide range of people; and with their particular knowledge and understanding they can help to provide insight on the nature of the problems and give recommendations for possible solutions.

During the fieldwork in all the landing sites where I conducted discussions, fishers and traders were pointing to the processing plants regarding the problems they encountered in selling of their fish. Therefore an interview with the processing plant managers helped me to understand how they perceive such complaints from the fishers and also to get their opinion regarding the topic of the thesis.

### **3.2.2 Secondary data**

These involved collections of reports and quantitative data from fisheries management and the research institute that are most relevant for the study, such as national guidelines for BMUs, survey reports, catch data, etc. Books and articles from internet sources for the literature review were also intensively used.

### **3.3 Sampling and representativeness**

The sampling methods used were purposive and random. Purposive was used to determine the landing sites and to identify the respondents, while random was used to sample respondents like fishers, traders, members of BMUs committee etc. The districts, beaches and processing plants where fieldwork was undertaken, including number of focus group discussions and interviews conducted by district, are shown in Table 2. A total of 47 focus group discussions and face-to-face interviews were conducted to complete the fieldwork.

Table 2: Sites visited during the study

<b>Districts</b>	<b>Name of BMUs, Processing plants (PPs)/ Organization</b>	<b>Focus-group discussions</b>	<b>Key-informant interviews</b>
Ilemela	Igalagala	3	1
	Mihama	3	1
	Kayenze	3	1
	Kabangaja	3	-
	PPs & Fisheries office	-	5
Magu	Ihale	3	1
	Chabula	4	1
	Kigangama	4	1
	District fisheries office	-	1
Misungwi	Chole	3	1
	Misonge	3	1
	Kigongo	3	1
	District Fisheries office	-	1

### 3.4 Validity, reliability and limitations

The BMUs were formed mainly for working as partners with the fisheries management authorities in managing the fisheries resource. This responsibility has greater impact on the relation between BMU committee leaders and other members in the fishing communities especially those involved with illegal fishing, such as beach seining. These illegal fishers have always been against the idea of co-management and the existence of BMU organizations. Their participation in focus group discussions could cause some discrepancies and reduce the validity and reliability of information collected, especially on issues regarding strength and weakness of BMUs and the whole process of BMUs' reformation. Sufficient time allocated in conducting at least three focus group discussions on the same beach involving different groups of people and in three districts helped to verify and validate the information collected. Also during the BMU reformation I

participated actively as a change agent and therefore it was easy to probe more into issues which needed further clarification.

It is believed that the use of both primary and secondary data can increase the validity of the data collected and reduces the biases of a researcher, but limited knowledge in the interpretation and use of such information might be a limitation in writing of my thesis.

## Chapter Four

### THEORETICAL FRAMEWORK

#### 4.1 The application of theory

The framework of the thesis is based on how the implementation of the co-management approach can contribute to poverty reduction in fisheries communities. By making the market work for the poor; a socio-institutional mechanism that can improve benefits and rewards of poor people in fishing communities is essentially required. A sustainable livelihood approach (SLA) is considered as one of the suitable approaches for poverty reduction in rural areas because of its emphasis on institutional capacities and linkages. Therefore the chapter will look theoretically how poverty is defined in fisheries, co-management and the applicability of SLA for poverty reduction in artisanal fisheries.

#### 4.2 Poverty

Poverty is complex and difficult concept because of its multidimensional nature. The World Bank with its long- term experience in poverty analysis has defined poverty as follows:

*“Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty is losing a child to illness brought about by unclean water. Poverty is powerlessness, lack of representation and freedom”<sup>7</sup>.*

The artisanal fishers in developing countries (including Lake Victoria) are powerless in terms of market power since they are price-takers, characterized by capital dependence which limits their freedom of participation in the fisheries. They are obliged to sell their fish to agents or processing plants that gave them financial support even if their price is very low compared to other buyers. Also fishers lack representation in the marketing process; the process does not provide room for negotiations between fishers and buyers, and is characterized by low prices and high fluctuations and unreliable terms of payment (Onyango et al. 2001).

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<sup>7</sup> <http://web.worldbank.org> Overview (Understanding the poverty).

A recent widely-adopted definition of poverty is the one which is proposed by the Development Action Committee's (DAC) Guideline on Poverty Reduction (OECD, 2001) which states: "*Poverty encompasses different dimensions of deprivation that relate to human capabilities including consumption and food security, health, education, rights, voice, security, dignity and decent work*".

Small-scale and artisanal fishers often live in remote and isolated communities, poorly organized and politically voiceless and are often highly exposed to accidents and natural disasters. Even if artisanal fishers may score relatively high in purely income terms when compared with small-scale farmers; but in terms of education, health, nutritional status, participation in political decision-making and vulnerability small-scale fishers and fishing communities often appear to rank lowest in society (FAO 2000).

#### **4.2.1 The old paradigm of defining poverty in small-scale fisheries**

Béné (2003) has characterized the defining of poverty in fisheries by associating with natural factors (fishing resource) and its associated exploitation level as an old paradigm. These have been exacerbated by Gordon's (1954) and Hardin (1968) with their perception that poverty is associated with the common property nature and open access of the fishing resource, ignoring other possible factors that can contribute to poverty in communities that their livelihoods mostly depends on the common resources.

The open-access nature of the fisheries allows more and more people to enter the fishing sector which in turn leads to the economic and possibly biological overexploitation of the resources and rent dissipation. According to Hardin the common property nature of the fishing resources leads to tragedy of the commons due to the irrational exploitation of the resources. According to Hardin (ibid): "*Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all*".

The low opportunity incomes in small-scale fisheries has also been explained as the cause of poverty in fishing communities; because small-scale fisheries are usually located in rural, remote areas with very few alternative employment opportunities. There is also the

perception that the fishery is “an employer of last resort” and therefore because of its open -access nature offer a livelihood to the poorest people through fishing activities.

*“Some have argued that open access (or quasi open access) to inshore and inland fisheries is desirable because it serves as an insurance and/ or safety mechanism against shocks for poor people who have lost permanently or temporarily their means of survival in other economic sectors (or regions)”* FAO 2000.

The old paradigm of poverty in fisheries has been summarized by a diagram below (two pillars) to illustrates how various situations complement and reinforce each other to maintain the impression that fishers are members of low status, marginalized households and eventually the impression led to the equation “fisheries = poverty” (Béné 2003).

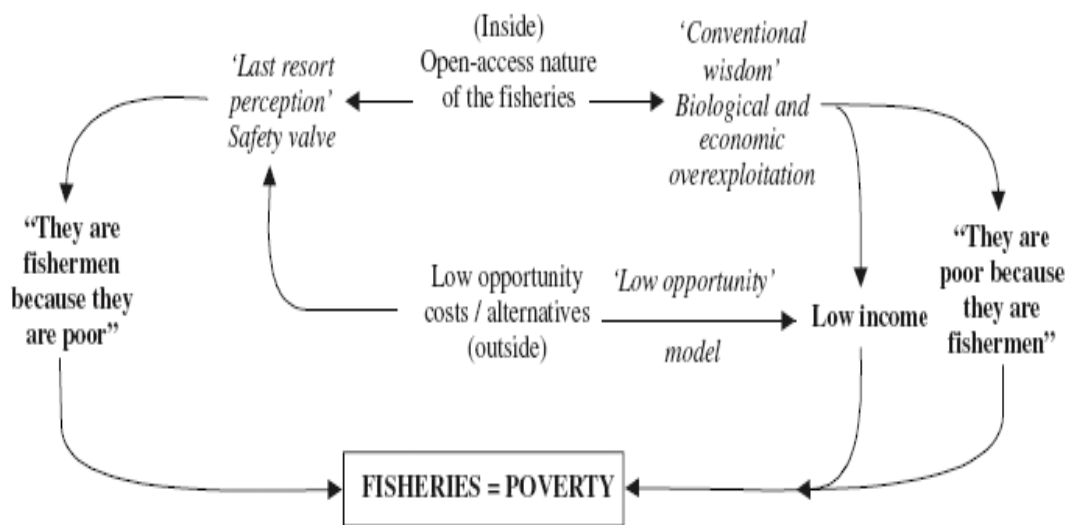


Figure 8: The two pillars of poverty in fisheries.

Source: (Béné 2003).

As noted by Béné there is no simple linear relationship between population, production, resource availability and poverty. It is necessary to redirect part of our attention and analysis effort away from the resources themselves and put greater emphasis on the role of *politics or power* over access, control and redistribution of these resources.

Commands of the social actors (individuals, household or group) over the fishing resources depends first on their position in their own society/community and second is on

their institutional arrangements which legitimize and govern these commands. In Lake Victoria fisheries, the gap between the owning and labouring classes between fishers within the industry is very high. Most of the actual fishing is done by crews who do not own shares in boats or gears, they entered into fishery as last resort (*they are the fishermen because they are poor*). Although crews always paid with a share of the catch, but a higher percentage of the catch goes to owners of boats and gears (Wilson et al. 1999).

It is also worth known that the market institution setup and business practice within the fishery has made both boat owners and crews continue to live in poverty situation. The credit-cum marketing relationship between fishers and the processing plants and middlemen, has made fishers powerless in influencing important issues like setting of fish prices and better business environment. And therefore such market institution setup can lead to the conclusion that boat owners “*are poor because they are fishermen*” which in the model not shown but just focused on the open access nature of the fisheries and ignore other factors like markets. In detail how the business practice contribute to the poverty situation in Lake Victoria (Tanzanian side) are covered in chapter six.

### **4.3 Co-Management**

Co-management has been defined as a partnership arrangement in which government, the community of local resource users (fishers), external agents (non-governmental organizations, academic and research institutions), and other fisheries and coastal resource stakeholders (boat owners, fish traders, money lenders, tourism establishments etc.) share the responsibility and authority for decision- making over the management of the fishery (Pomeroy and Harkes, 2000).

It covers various partnership arrangements and degrees of power sharing and integration of local (informal, traditional, and customary) and centralized government management systems (Fig. 5). It seeks equity in fisheries management and strives to activate fisher’s participation in the planning and implementation of fisheries management. The self-involvement of the fishing communities in the management of the resource will lead to a

stronger commitment to comply with the management strategy and sustainable resource use (Pomeroy & Harkes, 2000).

Co-management works on underlying basis of co-operation where the aspect of benefits is important to be clearly understood to partners involved since help to understand why people or groups of people co-operate. Co-management also works according to some explicit principles of democracy and social justice (Hersoug et al. 2004), where free and autonomous legitimate community organization is vital for representing resource users and stakeholders in influencing the direction of policies and decision-making.

Empowerment is a crucial thing as it is perceived as an enabling process in which individuals and communities can take responsibility and act effectively to safeguard or change their environment to meet local opportunities and problems (Jentoft 2004).

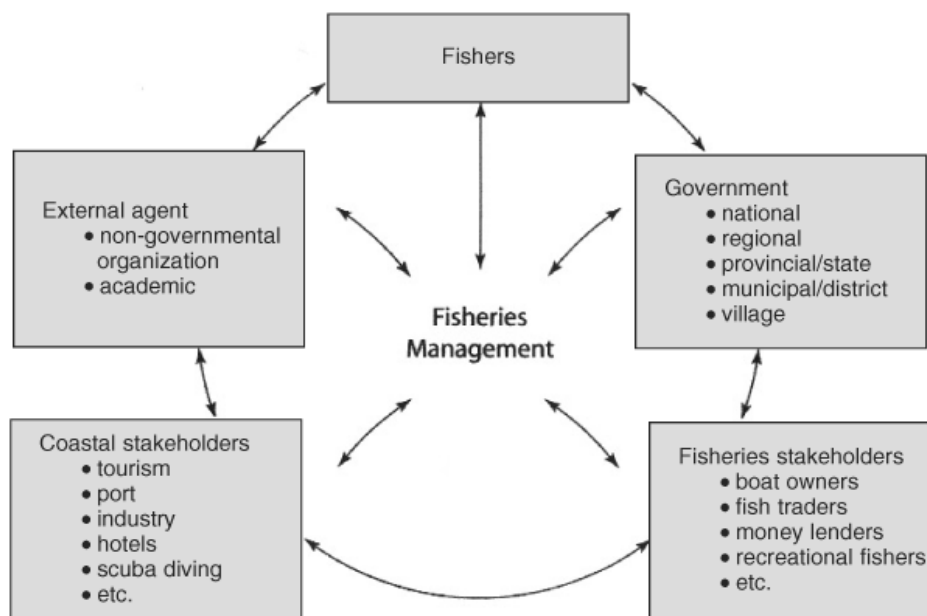


Figure 9: Co-management as a partnership.

Source: Pomeroy and Rivera-Guieb (2005)

Generally not all responsibility and authority should be vested at the community level, the amount and types of responsibility and/or authority that the state level and various community levels have will differ, and depend upon country and site-specific conditions.



Resource management and first hand sales of fish is an economic and livelihood activity that can be vested to a community. Government legislation and policy to establish supportive legal rights and authority frameworks must be available or established. Pomeroy & Berkes (1997) explained that the establishment of an appropriate government administrative structure and an enabling legal environment are essential efforts in order to promote and sustain existing local level fisheries management systems or development of new co-management systems.

The relevant user-group or household with rights to fish in the bounded fishing area to participate in the management and to be an organization member should be clearly defined, and how they should be represented, at which level should the co-management be instituted (i.e. at local, regional or state level) and final which management functions should be retained by the state and which should be handled by user-organizations (Hersoug et al. 2004).

There is a hierarchy of co-management arrangements from those in which the fishers are merely consulted by the government before regulations are introduced, to those in which fishers design, implement and enforce laws and regulations with advice and assistance from the government. Fisheries co-management can be classified into five major types according to the roles government and fisher's community play as shown in diagram below:

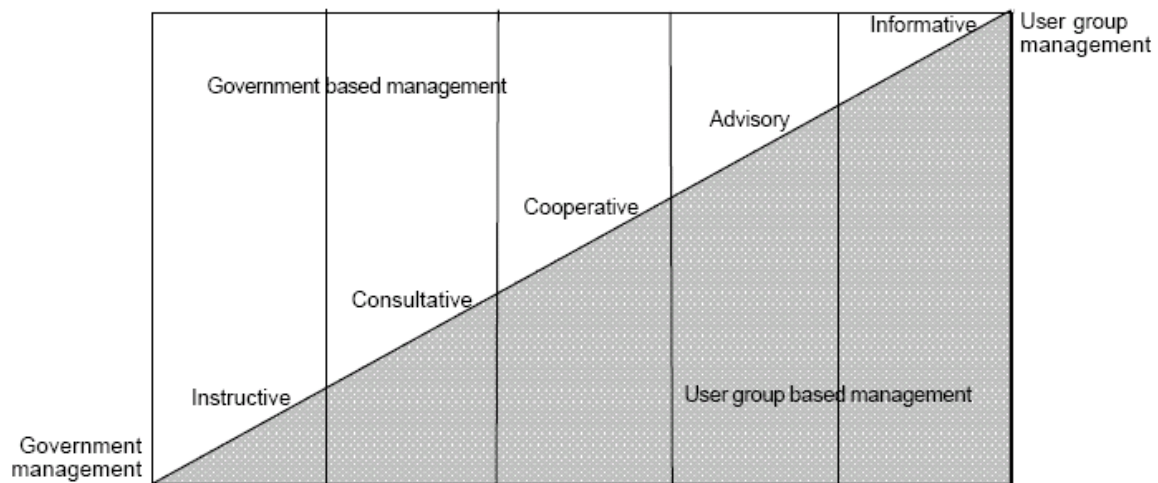


Figure 10: Spectrum of Co-management (Source: Nielsen 1996)

- *Instructive*: There is only minimal exchange of information between government and fishers. This type of co-management regime is only different from centralized management in the sense that the mechanisms exist for dialogue with users, but the process itself tends to be government informing fishers on the decisions they plan to make.
- *Consultative*: Mechanisms exist for government to consult fishers but all decisions are taken by the government.
- *Cooperative*: This type of co-management is where government and fishers cooperate together as equal partners in decision-making.
- *Advisory*: Fishers advise government on decisions to be taken and government endorses these decisions.
- *Informative*: Government has delegated authority to make decisions to fisher groups who are responsible for informing government of these decisions.

#### **4.3.1 Rationale of co-management**

Co-management promotes active participation of the fishing communities in planning, formulating by-laws and enforcement of fisheries regulations and this creates a high sense of ownership and legitimacy and hence compliance to fisheries laws and regulations. *“Co-management promotes participation of user groups, sense of ownership, which enhances legitimacy of the regulatory regime and hence compliance with fishing regulations”* (Hollup 2000:2).

Co-management makes the resource users have a better understanding on the vital issues regarding their fishery (state of fishery, their role as stakeholders, why certain laws and regulations are imposed) and fisheries tend to be better managed when the resource users and partner organizations have a good understanding of why they are managing the resource and what results are envisaged (Katon et al. 1997).

Co-management promotes elements of equity, fairness and democracy in sharing the resources and opportunities where decisions are mutually accepted between members and problems affecting them are jointly tackled.

Co-management enhances the information flow between resource users and central government. This is achieved through constant negotiations and interactions between all the stakeholders involved, while the state will be informed of what is taking place at local level and the fishing communities will be aware of what is taking place in the central government. This kind of information flow will help to prevent or reduce possible future conflicts between fishing communities and the state.

Co-management has proved to be efficient in terms of time and monetary costs since some activities are performed by resources users. For examples fishers will not need to spend time going far to fisheries division offices just for registering their fishing gears. Cost required for MCS will be reduced as the community also participates in taking care of resources and through education and awareness raising the community will use the fisheries resources sustainably and the state will spend less costs in surveillance.

According to Jentoft (1989: 147) *“a central argument for introducing co-management is that government bureaucracies are less flexible than fishermen’s organizations in enforcing management schemes”*.

Co- management promotes and nurtures accountability and transparency as all fisheries activities are performed in open and transparent way and these build trust between partners involved. Co management has greater hope towards the successfully management of fishery resource since there is utilization of knowledge and skills of both resources users and other professionals compared to the more centralized approach.

Apart from the above mentioned benefits of co-management, there are some drawbacks or risks of implementing this approach. The management of the fisheries resource is very sensitive and dynamic; such responsibility if completely left in the hands of resources users might leads to depletion of the resource since most of the fishing communities lack sufficient knowledge and skills on conservation and better management of the resources. This matter was also cautioned by Jentoft (2005:4) *“Fishing people are empowered when it becomes possible for them to sustainably manage their fishery, and capacity building is a means by which this may be accomplished”*

Also there are high initial investments of time, financial resources and human resources to establish co-management. Community awareness and sensitization, making institutional framework and capacity building of the fishing communities does not occur within a short time and these has greater cost of time and financial resources. As time pass some people might loose patience and expectations hence less motivation of being involved in co-management process.

Finally, the co-management arrangement involves various numbers of stakeholders which need to develop a consensus from a wide range of interests as a results it reduces the efficiency of co-management as much time needed for decision-making process and sometime result in weaker, and compromised measures.

#### **4.3.2 Co-management in Lake Victoria, Tanzania**

An observable decline in fish catches from the lake, environmental degradation, and failure of top-down fisheries management were among the reasons for adopting the co-management approach in Tanzania through the formation of the community-based management organization. The Fisheries Department in 1998-2000 strengthened the fisheries extension and enforcement through developing a program of involving the communities in fisheries management and this resulted into the establishment of over 500 Beach Management Units (BMUs) in beaches across the Tanzanian part of Lake Victoria.

The formation of community-based organization was a top down process, there were no active participation during the formation, but the community had to listen to the Fisheries Officers. The village government received a letter from the Fisheries Division directing them to call a meeting for group formation. On that day the objectives, responsibility, area of operation and other issues for institutional framework of Beach Management Units (BMUs) were explained to the fishing communities. The village members did not understand what it all was about, due to inadequate preparation and lack of awareness creation on the whole aspect of co-management principles.

The internal structure of BMUs consisted of five persons, chairman, secretary, treasurer and two other members. Externally the BMUs were meant to be under the security and

defence committee of the village government's administration. Since there were no prior agreements between the Fisheries Department and the Local Government Administration on how to go about it; some Government officials perceived that the BMUs were the groups of people established by Non-Governmental Organizations (NGOs) (Medard et al. 2004).

At the time of BMUs formation, members were informed that their main responsibility were implementation of fisheries regulations; making a fisheries inventory (fishers' name, residence etc), licensing fishing vessel and fishing gears, taking catch statistics, as well as education and awareness creation on fisheries related matters. Because there was no clear identification of the intended resource user-group and stakeholders, some people were opportunists and thought there would be financial incentives, some BMU committees ended by being formed by village farmers, non-fish traders, village leaders, fisher and even illegal fishers contrary to fisheries legislation. Due to the above reasons out 500 BMUs only 200 (40 %) were active and functional (Onyango et al. 2003).

From the fisheries community's point of view the idea of co-management was not clear enough for them to assume the greater responsibility of management of fisheries resources and implementation of fisheries regulations. They were not sure how this was going to make changes in their lives, whether it was going to improve their livelihoods or if it was going to create a denial of freedom on how to sustain their livelihood (Medard, et al. 2004). This could be one of the major reasons why some BMUs lacked support and cooperation and finally collapsed.

Lack of legal backing of the Beach Management Units by that time brought a lot of conflicts in their day-to-day operations. The BMUs' operations were based on mutual understanding, trust and hope to the main governing institution - the Fisheries Division. Some BMU members involved with arrests and prosecution were being abused by offenders from their own communities and these incidents made them loose hope and become less involved in co-management.

In year 2003 new fisheries legislation No 22 was issued and the problem of legal backing is now solved. Under this new legislation no one will be allowed to be involved in fishing activities he (she) is not a member of BMU and to get such membership is achieved through the vetting process of the existing members in the BMU. The new fisheries legislation and regulations issued in 2005 defined owners of boats and fishing gears, crews, net menders and boat builders and repair, local processors and fish traders are the community members that are eligible to form the BMUs.

In order to improve the performance of the BMUs and adopting the harmonized BMUs structure proposed by partner states owning the lake, in 2006 there were reformation of BMUs and 433 BMUs were reformed in Tanzania part with the support of the fisheries management project (IFMP). Other stakeholders participating in the implementation of this co-management are the fisheries division and research institutes, non-governmental organization, development partners, local government and its technical staff.

The new BMUs will have the responsibility of making registrations and keep records for boats and fishing gears and their owners, crews and numbers of members in BMU at each beach. They will further decide on gears and engine identification marks which are registered by the fishers. Making fisheries by-laws and enforcement after being approved by local government at district level and propose on fish breeding grounds based on their fishing experience and indigenous knowledge. They will assist in taking daily statistics on fish catches and selling prices and make annual planning on BMUs activities and fisheries in general.

#### **4.4 Sustainable Livelihood Approach (SLA)**

It has been evident that in developing countries artisanal fishers have different livelihood strategies in order to sustain their lives. In Lake Victoria, Tanzania; artisanal fishers are recognized to be involved with agricultural farming, livestock grazing, trading of fish and fisheries related products, and fish processing (Onyango et al. 2006).

The broadly accepted definition of “livelihood” comprises the capacities, assets (material and social resources) and activities needed to live. Livelihoods are sustainable when they

can withstand and overcome constraints and shocks, and maintain or strengthen capacities and assets; both in present and in the future without undermining the natural resource base (Chambers and Conway 1992).

The multi-dimensional nature of poverty and the relationship between poverty and vulnerability in fishing communities is increasingly acknowledged; and a broad and multi-disciplinary approach for understanding and responding to these multiple dimensions of poverty is essentially required.

The SLA has been considered as useful approach for poverty reduction in several low-income countries. It provides both a set of guiding principles and an analytical framework for understanding the strategies of artisanal fishers confronted by fluctuating fisheries resources (Allison & Ellis 2001). The working principles of SLA have been summarized by Allison and Horemans (2006) as follows:

(i) *Putting people's social and economic activities at the centre of the analysis*, Management efforts to reduce fishing pressure or allocate rights for access over the fishing resource to the poor should be emphasized more in understanding people than just their 'fishing effort'.

(ii) *Assessing options for management and development intervention that transcend sectoral boundaries* such as fisheries, agriculture, pastoralism, wage labour or small enterprise, and that incorporate issues affecting all people, irrespective of occupation, such as access to social services (e.g. health, education, and social security), political representation and judicial services.

(iii) *Making micro-macro links*. SLA is a multi-layered operational approach that encourage explicit consideration of links between local issues (such as the resource allocation among different types of resource-users in a fishing port), meso-level processes (such as decentralization of government bringing planning and financial management under the control of local authorities) and wider concerns, including national policy and economic or social change (such as the adoption of a new fisheries policy or legislation, and the liberalization of markets).

(iv) *Being responsive and participatory*

The poor and vulnerable populations should be the key actors in the development process and promote a dynamic, adaptive and learning approach to management.

(v) *Building on strengths*

In efforts to reduce poverty SLA based on community strength, it integrates community's livelihoods strategies by taking into consideration those that communities themselves consider to be important in order to achieve sustainable benefits. In fishing communities, these may include extensive local or indigenous technical knowledge, strong vocational skills and diverse and flexible livelihood strategies.

(vi) *Taking a broad view of sustainability.* In fishery management the four key dimensions to sustainability (economic, institutional, social and environmental) are all important. SLA makes these dimensions explicit and also recognizes the dynamism of peoples' lives and does not view sustainability in static, equilibrium terms. Sustainability is viewed instead as the capacity of elements of a livelihood system (people, institutions, environment and economy) to withstand shocks and adapt to change.

Currently the SLA has been used to 25 countries in West Africa of which 20 lies on the coast through the implementation of Sustainable Fisheries Livelihoods Programme (SFLP). Through the pilot studies of the impact of policies, institutions and processes (PIPs) on the livelihoods of small-scale fisheries communities; it has been found that several factors external to the fisheries sectors have significant impacts on the fisheries communities' livelihoods. Policies set centrally and external factors linked to human activities (farming, tourism, coastal development, etc.) are examples given. The SLA has a lot to do with considering the objectives, the range and the priorities of development. Its overall purpose is the poverty eradication seen in terms of both actual poverty and vulnerability to poverty. According to DFID (1999), SLA has six overall objectives that are meant to accomplish:

- (i) More reliable access to natural resources and the better management of those resources
- (ii) Improved access to good quality education, information and technologies, to high quality training, better food and good health
- (iii) A social environment which favours cohesion and integration



- (iv) Better access to basic infrastructure and support
- (v) More reliable access to financial resources
- (vi) An institutional environment which supports various livelihoods strategies and assures the promotion of equitable access for all to competitive markets.

Looking on the above mentioned objectives; SLA aims to reduce poverty amongst coastal and inland communities through sustainable use of aquatic resources. Poverty reduction and livelihood improvement are envisaged to take place largely through the development of social and human capital in fisheries-dependent communities, by maintaining or enhancing the natural assets used by those communities, and by supporting the development of appropriate policy and institutional environments instead of introducing new technologies. The co-management arrangements should be designed in such away that it promotes an equitable access for all to competitive markets as a livelihood strategy in order to improve benefits and rewards of all involved with harvest and processing of fisheries resources.

#### **4.4.1 The Livelihoods framework**

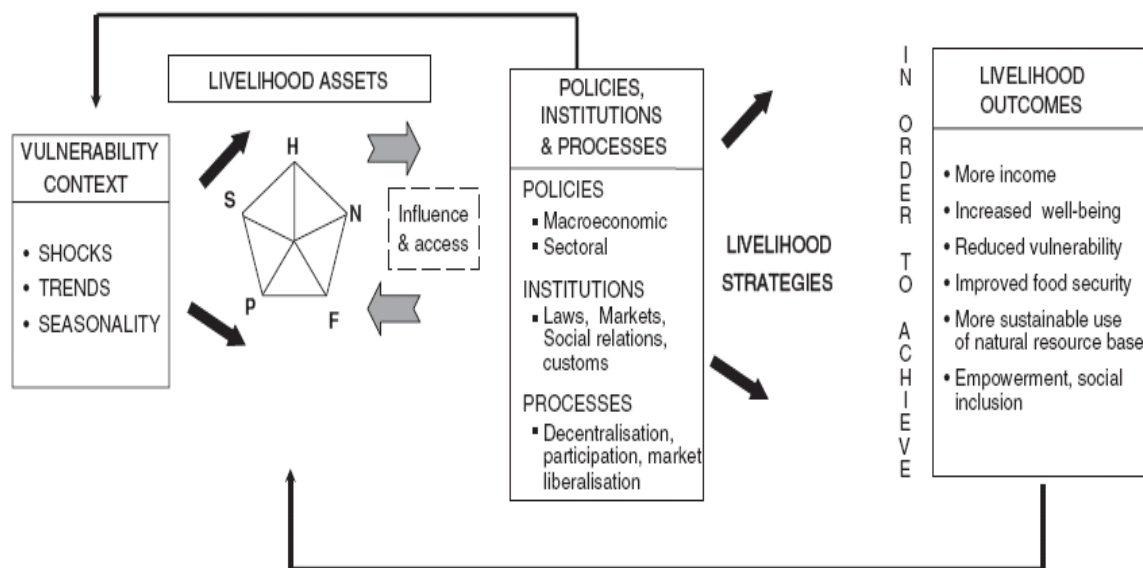
The livelihoods framework brings together assets and activities and illustrates the interactions between them (Fig 7). The social and economic unit here referred as household and conceived as the social group which resides in the same place, shares the same meals and makes joint or coordinated decisions over resource allocation and income pooling (Allison & Horemans 2006).

The framework recognizes five main assets which includes physical capital (produced or economic capital like boats, nets etc), natural capital (land, trees, fish stocks etc), human capital (people's capabilities in terms of their education, health, labour, knowledge and skills), financial capital (savings, credits) and social capital (associations, membership organization, peer-group networks kinship networks). The access to both assets and activities is enabled or hindered by policy, institutions and processes (PIPs) context of livelihoods, including social relations, markets and organization; also is affected by

external factors referred to vulnerability context comprising trends and shocks that are outside the control of the household.

Capital assets permit livelihood strategies to be constructed, and these are composed of a portfolio of activities of which some are natural resource based and others are not. Mobility and migration has been noted as important livelihood strategies for many artisanal fishers.

Finally is the outcomes; a livelihood is sustainable if people are able to improve their standard of living including the well-being , income and/or other human development goals, reduce their vulnerability to external shocks and trends, and ensure that their activities are compatible with maintaining the natural resource base, like the fish stocks.



**Legend :** H: human; N: natural; F: financial; P: physical; S: social ...Capital

Figure 11: The Livelihood framework (Allison & Horemans 2006)

#### 4.4.2 Institutional framework for poverty reduction in Tanzanian fishing communities

It is believed that continued use of destructive fishing methods and the increase of fishing effort is associated with poverty which persists in the fishing communities. Poverty alleviation initiatives for sustainable livelihoods and food security are among the

identified areas for support. The economic diversification and poverty reduction initiatives will help to reduce the problem of increased fishing pressure. Government recognizes the poverty situation in fishing communities and under its fisheries policy and strategy statements it states as follows:

*“Given the situation that the majority of the people in Tanzania lives in the rural areas and are poor, the role of the government is to assist the local communities to become aware of their own situation and support them to become responsible for their own destiny by making better use of the fish resources”.*<sup>8</sup>

In alignment with such policy statement different strategies were developed to promote fish production and generate income through employment creation as a measure for poverty reduction and these includes:

- (a) Encourage the allocation and utilization of fisheries resources in favour of the rural community so that they result to human welfare development.
- (b) Empowerment of women, regarded as natural resources managers in the society, access to resources is considered to be a critical factor in the effective eradication of poverty.
- (c) Promotion of private investments in the sector in order to stimulate fish production, processing and marketing and other related social economic activities.

In Tanzania the Vice President’s office has the central role of monitoring and coordinating the implementation of poverty eradication efforts as stated in the national poverty eradication strategy of 1998. The office also has the mandate to ensure that all government’s organs and other stakeholders interact on poverty eradication issues, designing poverty indicators and promote participatory methodologies in poverty eradication initiatives.

The poverty eradication efforts goes down from Vice President Office, poverty eradication advisory committee, central ministries, sectoral ministries, regional, district, ward up to the village government and households, families and communities. Under

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<sup>8</sup> <http://www.tanzaniaonline.com>

these household, families and communities level; are recognized as main actors in poverty eradication efforts, they are responsible to identify and prioritize their needs and mobilizing their locally available resources (financial, material and human). The village governments are responsible to enact by-laws that encourage poverty eradication initiatives like environmental protection, community participation and promote self-reliance. Also they are responsible organs to oversee all activities undertaken by NGOs and Community-Based Organization (CBOs) including BMUs in their respective villages.

As it is discussed in the poverty theory, the market institution setup and business practice has major contribution of poverty situation in fisher's community. The globalization of Nile-perch fishery has attracted numbers of actors including middlemen join the fishery with greater influence in overall ways of conducting fish business in Lake Victoria (Tanzania side). And therefore the middlemen theory and its implication in fisheries industry are also discussed as part of important theories of this thesis.

#### **4.5 Middlemen and intermediaries**

In a complex economy where producers and consumers are widespread; most producers do not sell their goods directly to the final users. Between them there is a set of intermediaries performing a variety of functions. These intermediaries form the marketing channels, also called distribution channels. They are sets of interdependent organizations involved in the process of making a product or service available for use or consumption (Kotler and Keller 2006).

There are three types of intermediaries between the producer and the consumers as identified by Kotler and Keller (2006); *merchants* such as wholesalers and retailers, are middlemen that buy, take title to, and resell the products. *Agents* include brokers, sales agents, and manufacturer's representatives. Agents always search for customers and may negotiate on behalf of producers but do not take title to the goods. Lastly there are *facilitators* such as transportation companies, independent warehouses, banks, advertising

agencies that assist in the distribution process but neither takes title to goods nor negotiates purchase or sales.

In economics, middlemen play a productive role in the economy by reducing search costs in markets, total selling costs, resolve the adverse selection problem between buyers and sellers, and alleviate the moral hazard problem associated with inducing firms to maintain high-quality goods (Biglaiser and Friedman 1994).

In principal-Agent theory; adverse selection is associated with bad selection of buyer or sellers because of *hidden-information*, while moral hazards related to *hidden-actions* (Bolton and Dewatripont 2005). The moral hazard problem, means that the principal (the one contracted the agent) frets that the agent may shirk, shift resources to an agenda not related to the contract, or otherwise does not live up to the duties stated in the contract. According to Biglaiser and Friedman (1994); middlemen helps the producing firms to be charged with a low price premium by the insurance company since they are also share the burden of the company in ensuring that high-quality products re delivered to the customers.

According to Biglaiser (1993) middlemen as experts who can reduce the inefficiencies in a market where there is an adverse selection problem, based on two features. First, middlemen buy more goods than an ordinary buyer and therefore have an incentive to make a large investment in skills that enable them to detect a good's true quality. Second, middlemen are in the market for longer time and therefore may place higher value on their reputation for selling high-quality goods than does a seller who has only a few goods and does not stay in the market for a long time. In small scale fisheries agents and retailers are the most common middlemen that know how to operate and usually make a profit by buying fish from individual fishers and sell to the processing plants or to local markets at a higher price.

#### **4.5.1 Middlemen in Lake Victoria fisheries**

In 1990s the Lake Victoria regional authorities banned trawl fishing which was the major source of fish supply to the fish processing plants. The result was that the processing

plants adopted a new strategy of sponsoring the artisanal fishers by supplying nets and engines in return of fish supplies. As times went by these fishers became more wealthy and graduated to become the most powerful agents that purchase fish from other fishermen to supplement their own catches before selling to the factories (Thorpe and Bennett 2004).

Currently in Lake Victoria Tanzania there are three types of middlemen that are engaged in buying and selling fish to the processing plants and local markets; these middlemen include agents, fish mongers and bicycle traders. Fish agents are the most dominant group that supplies Nile perch fish to the processing plants. Some agents have contract with the processing plants and some just operate freely by selling their fish to any processing plant that offers better prices. Agents that operate under contract usually rent the collector boats and trucks from the factories while those who operate as free agents, usually possess their own collector boats or trucks (Luomba 2007).

Fish mongers are middlemen that mostly purchase and sell fish to the agents. Fish mongers usually have low operating capital compared to the factory agents. This is a group which contains many women because of the small amount of capital that is required for starting the business. Some fish mongers started as fish collectors hired by the agents until they established themselves and slowly developed and managed to supply fishing gears on credit to fishers in order to have guarantee of fish supplies and sell to other fish agents. Others are small fish mongers with no guarantee of fish supply and they mostly depend on fish taken by crews for personal consumption when they return from fishing.

Bicycle traders can be considered as retailers since they are traders that purchase fish in small quantities and sell to final consumers in the nearby villages from the beaches where fish is purchased. In the case of Nile perch (*Lates niloticus*), bicycle traders and local

processors usually buy fish rejects and undersized fish<sup>9</sup> from fish mongers and sell to the local market, but for the other species, like Tilapiines, they usually purchase directly from fishers and sell the fish to the local market.

Within the fishing communities, fish agents are the most powerful people that determine the price of fish per kilogram and the weighing scales that can be used at the beaches. Generally, middlemen in the fisheries sector are appreciated for the vital role of collecting fish from major landings beaches as well as from obscure and inaccessible beaches for delivery to the processors and other local markets, but on the other hand it is the group that is mostly blamed for being responsible for the low income to fishers, because of the low prices they offer in purchasing fish and they use faulty scales in weighing the fish (Yongo et al. 2005).

During the fieldwork the average price per kilogram reported by respondents was in the range of Tanzania shillings 1,400/= (Tshs) to Tsh 1,800/= <sup>10</sup>. With this price the fishers were complaining that it was not enough even to buy a litre of fuel which is a mandatory cost for most fishers that are using outboard engines.

#### **4.5.2 Middlemen as credit lenders in Lake Victoria fisheries**

Apart from the role of purchasing and selling fish to the fish processing plants and local markets, middlemen also play a vital role of financing activities in small scale fisheries. Most agents offer credit to fishers in form of fishing gears (engine, nets and long -lines) and boats in return for fish supplies. During fieldwork fishers claimed that the fishing gears they received as credit do not imply ownership of those gears since they are always taken back by agents in case of misunderstandings (usually caused by disagreement regarding fish prices or the weighing scales) between the two parties, and the repayment duration of the credit is normally not known to the fishers.

Agents also offers credit in the form of cash to finance the running costs of fishing activities to fishers, which also is returned in form of fish supplies soon after they have

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<sup>9</sup> Fish rejects: Include contaminated and undersized fish which are not allowed to be processed in the processing plants.

<sup>10</sup> 1 USD is approximately to 1,165Tshs

sold their catches. All fishers that have received credit from agents are always given low prices in selling of their fish compared to fishers who are independent in financing their fishing activities. The low price of fish and unpredictable fish catches are factors that contribute to fishers spending longer time in repayment of their credits. The problems associated with the current fish selling system will be discussed more in detail in chapter six.



## Chapter Five

### REFORMATION AND PERFORMANCE OF THE BMU SYSTEM

#### 5.1 The formation of BMUs

In Lake Victoria, the Beach Management Units (BMUs) are the foundation of fisheries co-management. The BMUs are community-based organizations that bring together everyone involved in fisheries at the beach level. Boat owners, crews, traders, processors, boat builders and repairers and net repairers are the primary stakeholders identified to work with government and other stakeholders in managing fisheries resources and improving the livelihoods of the community members.

The legal framework for the formation of BMUs in Tanzanian side was specifically based under the Fisheries Act No. 22 of 2003, Section 18, and the Fisheries Regulations of 2005, Regulation 104, and generally under the Local Government Acts No. 7 and No. 8 of 1982.

Under guidance of national BMUs guidelines, 433 BMUs were reformed under the supervision of fisheries managers and village leaders. These officials had a great responsibility in the whole process of institutionalization of the newly reformed BMUs. They were responsible for adherence of the step-by-step procedures as stipulated in BMUs national guidelines to make sure that the elections of the BMU-committees were fairly and democratically done.

Co-management works according to some explicit principles of democracy and social justice for the formation of free and autonomous, legitimate community organization. During the fieldwork it was found that there were some beaches where the formation process was strictly followed, and the fisher's communities declared that there is true representation of the fishing community in the organizations, while in other beaches the true fishers had been left out. In some beaches where sensitization was thoroughly done, community members were highly motivated and participated actively in the election of committee leaders (Fig 11.). The project coordinator of IFMP who supported the whole process of the BMU formation and the capacity building, claimed that; “ *As fisheries*

*managers; we are worried because during the election the community were highly motivated in such a way that some illegal fishers surrendered their fishing gears and participated very actively in the election”.*

The motivation of fishing community in joining a co-management arrangement is expected to be demonstrated through full participation and support in BMUs activities which already identified as a problem by BMUs committees: and is shown in table 2 of strength and weakness of the Organization.



Figure 12. People lined up during the election of committee leaders in one of the beach  
(Source LVFO 2007)

At Kayenze beach, one of the well developed beaches for Nile perch landing in Ilemela district, fishers claimed that there is no true representation of fishing community in their BMU because there was no election of committee leaders. All members at the beach were sensitized for co-management and registered as BMU members but information for assembly meeting in order to elect the committee was not given and instead the fisheries officer in collaboration with village leaders came and announced the new BMU committee just by making some adjustments from the former BMU committee. One of the respondents said:

*“I think there is no representation of fishers in the current BMU since there was no election as a result the current BMU committee is just fully occupied with those who are running hotels at the beach.”*

Under the national BMUs guidelines all BMUs committees are supposed to be formed by 9- 15 members and out of these, fishers both boat owners and their boat crews constitutes 60 % by each group contributing 30%. These two groups are key players for the sustainability and functional working of co-management arrangements and any attempt of poverty reduction efforts in the fishing community. Fishers are expected to participate and allow their boats to be used in patrols and support the surveillance group in identifying those involved with illegal fishing. It is believed that some of the illegal fishers belong in the same fishing community where these BMUs are formed. Also fishers are important stakeholders that can assist fisheries professionals in providing vital information on the status and trends of the resource, based on their fishing experience. The other groups which are supposed to form part of the committee are the fish processors, boat builders and net repairers also constitute 30 %; in this group their livelihoods is much dependent on fish and fisheries related activities. Traders of fish constitute 10 % and the group is mostly dominated by fish agents and fish mongers, although it has been found that most of the fish agents are BMU members but are not in the BMU committees (Luomba 2007).

In some beaches there were no even sensitization or election campaigns. Those people who were interested to be BMUs leaders were asked to fill forms and being elected on assembly meetings, like in Kabangaja beach which is one of the field sites that I visited.

As I mentioned in the previous chapter on theories, one of the reasons of the reformation of BMUs was to solve some of the problems identified in evaluations undertaken in the former BMUs system. The issue of stakeholder conflicts, especially in BMU committees with village leaders and misunderstood of the whole idea of co-management were obvious reported in some evaluations undertaken before the reformation of the BMUs (Onyango and Mahatane 2003; Medard et al 2004). The problem seems to persist as has been reported in the post training evaluation report on BMUs’ orientation conducted in

May 2007. The problem could be mostly associated with poor sensitization and unadherence of procedures of BMUs national guidelines on the whole idea of co-management and reformation of BMUs to local governments and fishing communities as happened in some beaches like Kabangaja and Kayenze as stated above.

The organization structure of the BMUs is encompassed with a BMU assembly and a committee of 9-15 members who are democratically elected from the BMU assembly. The committee consists of the Chairperson, Secretary, Treasurer, Storekeeper and any other post agreed by the BMU's assembly, and sub-committees may be formed as need arises. It is also insisted that at least three women should be included in the committee. Women and boat crews are groups that previously were considered to be marginalized in decision- making in the Lake Victoria fishery.

Currently most BMUs have security and defence sub-committee, beach sanitation, hygiene and fish quality control sub-committee, finance, economic and planning sub-committees and few BMUs also have sub-committees responsible for taking catch data. It is only a few BMUs currently involved with taking catch data because as stated in chapter two most fishers have only primary education and therefore such responsibility need capacity building and only few BMUs already got such training.

## **5.2 The overall objectives of the BMU organization**

The primary objective for the establishment of BMUs was to have an arrangement in which the fishing communities, government and other stakeholders can share the responsibility and authority for the management of the fishery. The idea seems to be understood by most fishing communities in Lake Victoria. Table 1 are some definitions which were given by respondents during the fieldwork. Resource management and environmental protection of the Lake; are primary roles which were mentioned by respondents although it is still unclear for them whether the BMUs are groups, committees or organization. It was also realized that from fishers' point of view, the BMU organizations have other primary objectives than resource management. As it has been stated by Hara and Nielsen (2003); most people in fishing communities focus on

economic objectives. Therefore struggling for better prices for their fish, and credits to BMU members were among the most important expectations stated by most fishers during fieldwork.

*“BMU brought by government and all fishers were required to register and sensitized that the organization will bring benefits to us, offer credits and have better price for our fish”<sup>11</sup>.*

In BMUs’ national guidelines it is stated that to improve the welfare and livelihoods of people in fisheries dependent communities through improved planning and management, good governance, democratic participation and self-reliance is among the defined objectives for the formation of BMUs. Currently much effort and resources are directed to the community’s ability to participate in the management of the resource.

As emphasized by SLA through its working principles; management efforts should be emphasized more in understanding people than just their fishing efforts. The effects of poverty and lack of alternative economic opportunities in most fishing communities drive up their preference for consumption today instead of the longer term perspective of sustainable fishing. Therefore management efforts should be integrated with livelihood strategies without delay and before the implementation of co-management approach started. It has also been highlighted that achieving sustainable exploitation of the fisheries in most water bodies is likely to be dependant on the broadening of economic opportunities and the general economic development in concerned rural communities (ibid).

Table 3: BMU definitions given by respondents (Source: Focus group discussion)

S/NO	Definitions
I	BMU is the organization/ committee formed for management of fisheries resource in order to have sustainable resource.
II	BMU is the union of village members for resource protection.
III	BMU is a group which will bring benefit to community by

<sup>11</sup> That was repeated statement by many fishers in the beaches visited during the data collection.

	preventing illegal fishing and increase fish production.
IV	BMU is a group formed under government structure to control all activities in fishing community; aims to fight illegal fishing by community members themselves control each other.
V	BMU is a group for environmental protection and work in collaboration with fisheries officers to fight illegal fishing, it is considered as special committee under village government structure.

### 5.3 BMUs current performance

Currently, there is on-going capacity building activities for the newly reformed BMUs and mostly it is training of BMUs committee members. It was realized by all three partner states that most BMUs committee members have an inadequate understanding of their roles and responsibilities in their BMUs operations.

This has also been raised by the fishing communities as shown in strength and weakness of the organization. The already conducted training brought together both BMUs committee members and village leaders, and nine key areas which were emphasized include civic education, fisheries management, co-management, the BMU institution and its relationship to co-management, leadership and governance, conflict management, planning and reporting system (Coordinating Office 2007).

The majority of fishing communities and the fisheries authority believe that the BMU-system will contribute towards sustainable fisheries, and one of the successful achievements so far is stopping the illegal fishing by poison like in Misonge beach in Misungwi district. This was also emphasized by Mwanza regional fisheries manager as follows:

*“BMUs will contribute towards sustainable fisheries because each BMU have at least 10 committee members which makes about more than 4,000 people while number of fisheries staff is less than that, but full cooperation and capacity building to BMUs is highly needed”*

In all beaches visited during the fieldwork, the following activities are reported to be undertaken by BMUs:

1. Fight illegal fishing
2. Environmental protection and beach sanitation
3. Handling of fish quality and hygiene
4. Recording catch data at the landing site
5. Conflicts resolution at the beaches
6. Community's sensitization on acceptable fishing methods and practices
7. Protect fish breeding areas
8. Some participate in the registration of fishers and their fishing crafts
9. Issue introduction letter to fishers who want to transfer to another beach
10. Gather information from migrant fishers at the beach about the number and, type of their fishing gears, and number of crews they come with

Despite the positive belief in the BMU-system; some fishers still have some doubts if BMU will contribute towards sustainable fisheries due to the existence of other kinds of illegal fishing like the use of undersized mesh gillnets and beach seines which seem to increase according to the frame surveys undertaken. It is believed that through community participation resource users will be in a better position to understand the vital issues regarding their fishery, such as the state of the resources, their roles as stakeholders and why certain laws and regulations are imposed. All these are mostly achieved through sensitization programmes. It is also crucial to take into consideration when these communities are ready to be entrusted such responsibilities regarding resource management. Some respondents, especially BMU committee members, felt that there was little time allocated for community sensitization. As a result there is less support or involvement of the fishing communities in the BMU activities. The community perceived their main responsibility was to elect the committee members and that these committee members had a role in resource management. This was evident during the fieldwork when I asked who the BMU members were; most respondents mentioned the committee members without including themselves.

It is expected that both committee members and the fishing community will participate in resource management through a proper work plan, allowing their fishing boats and engines to be used on patrols since most BMUs lack equipment for conducting patrols. Also it is considered that *sensitization* was not enough, because some fishers still do not believe that illegal fishing methods and practices contribute to a decrease of the fish supply. According to their understanding, the reduction in catches is due to seasonal variations.

Technically this means there was no enough time allocated for the government to explain why they want collaboration with the fishing communities in resource management instead of the traditional top-down management. Table 2 below shows some summarized strength and weakness of the BMU system as perceived by respondents during the fieldwork.

Table 4: BMU's strength and weakness

<i>Strength</i>	<i>Weakness</i>
BMU formed by all stakeholders at the beach	Lack of cooperation between BMUs and some village governments
Continue support and collaboration from district fisheries office	Some elected BMUs committee members have no fishing activities which make them easy to be bribed.
On- going capacity building like training offered to committee members	Little support of fishers community in BMUs activities
Legal backing.	Weak building foundation of the whole idea of BMUs and the governing laws for its establishment
Political will from the majority of some government officials	Most BMUs lack long-term sources of funds
BMUs trusted and entrusted in the management of the fisheries resource	Lack of BMU network or links
Some BMUs have long-term source of finance by being tendered by government	Majority of BMUs committee members does not know their roles and



to be tax collectors	responsibilities
	Lack of incentives to BMUs committee members

The institution framework that links BMU with government from central to local authority also is a bit challenging. There is consensus that BMUs are special committees for fisheries resource management in the village governments. Such BMUs existence requires the village governments' initiatives in demanding the presences of such committees under the law of local government which is governing the establishment of villages and this has not yet been done by most village governments. Some fisheries managers are arguing that if the village governments will not fulfil their role of demanding the presence of BMUs committees in their village governments; this might cause some legal problems in the future.

Figure 13 below shows the proposed setup for the implementation of co-management in Tanzania. Under such decentralized system, the district fisheries managers who always act as returning officers in co-management issues are under the two ministries but employed by the local council as technical expert of the fisheries matters in the districts reporting to the District Commissioners (DC's) and District Executive Directors (DED's). The district fisheries officers are also responsible on day to day activities of resource management as identified by the fisheries division under the ministry of livestock and fisheries. The framework has been complained by most fisheries managers because sometimes contradict with the objective of the fisheries division of achieving sustainable fisheries. For example as district fisheries managers are required to maximize the revenue collection through licensing of fishers and their fishing gears under local government authority while are supposed to discourage the overexploitation of fishery resource as among of the fisheries division objectives. Such institution framework is the same as to village authorities and the BMUs in implementing the resource management where they can receive directives either from district council or fisheries division via the on district fisheries managers.

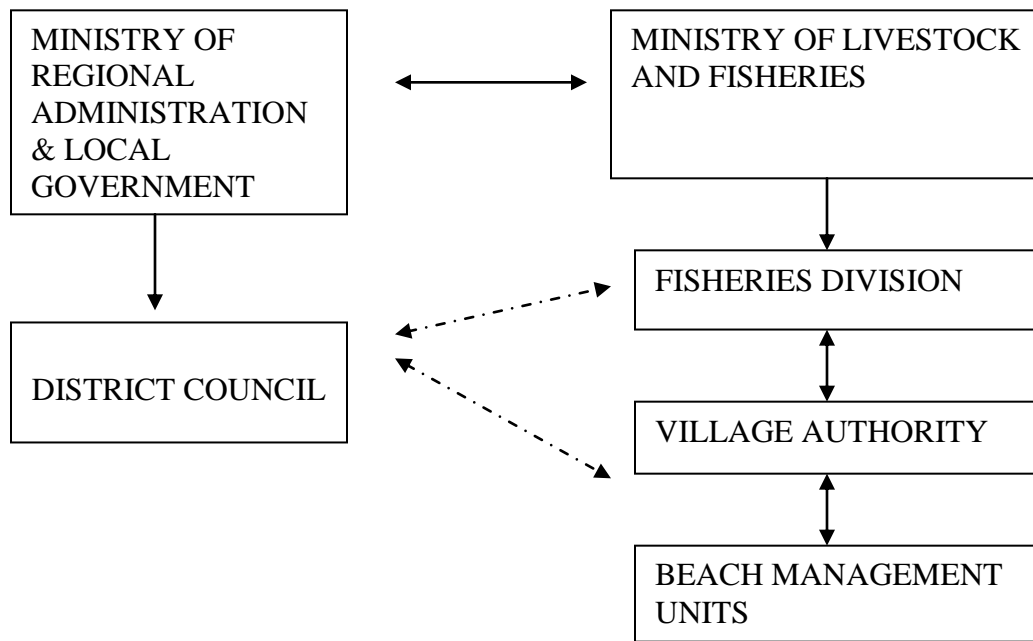


Figure 13: Proposed setup of fisheries co-management in Tanzania.

(The broken arrows indicate administrative support services, while solid arrows indicate a two way fisheries management communication (adopted from Bulayi 2001).

In promoting the adoption of co-management, it is believed that fishing communities will mobilize their assets (material and financial) for self-finance as the development partners are short-term supporters. Lack of funding is among the identified weaknesses of many BMUs except for a few BMUs that succeeded to be tax collectors on behalf of government, a practice which is strongly opposed by many fishers.

*“BMU committee should not be allowed to collect taxes because now even small fish are accepted by them just because they want to meet the amount they bid to the district government as tax collection”*( fishers at Kayenze beach).

Some fisheries managers feel that the issue of self-finance in the Lake Victoria fisheries management is very difficult because some beaches where the BMUs formed have very low income inflows and the communities are reluctant to contribute financially to BMU activities. As pointed out by Ostrom (1994), financial dependency is the one of the threats to long-term sustainability of co-management because it weakens the capability of the local institutions to sustain themselves over time. Government and the BMU

communities should demonstrate their long-term commitment by starting to make financial contributions to the programme before the external support is phased out.

#### **5.4 Suggested ways to improve the BMUs' performance**

Fisheries management requires a wide range of expertise, experience and skills. It is through *empowerment*; fishing people becomes possible for them to sustainably manage their fishery. Empowerment is a process through which people become strong enough to participate within, share in the control of and influence, events and institutions affecting their lives (Torre 1986).

It is also perceived as an enabling process through which individuals and communities can take responsibility and act effectively to safeguard or change their environment (Jentoft 2005: 2). In Lake Victoria, capacity building for both communities as BMU members and the BMUs' committee members is an essential component of empowerment that is highly needed.

Training and awareness raising programmes on fisheries management issues, roles and responsibilities of each member in the organization and on how to make BMU by-laws are essentially required. Illegal fishing is a major problem that hinders the sustainable utilization of the fishery resources in Lake Victoria. Capacity building on modern and improved boats and engines for patrol is also needed, as it has been stated by respondents that most illegal fishers have better engines and boats.

Another way that can improve the BMUs' performance is through *integrating fisheries co-management with broader development objectives*. Although it has been highlighted in policy, fisheries legislation and the BMUs' national guidelines; capacity building should be done for BMUs and their members on how they can explore opportunities available for poverty reduction in the country, like soft loans that are offered by government for poverty reduction initiatives.

Financing of fishing activities is an already known barrier for the development of fisheries and rural development in general. Fishing communities through their BMU organization should be encouraged and mobilized to initiate savings and credit schemes where such arrangements can be used as sources of sustainable funding for both fishers and BMUs to run their operational costs. Through accrued interests generated from credits offered to its BMUs members and other fees that will be charged for services offered, these monies can be used as a source of income to the BMU organization.

Another way of improving the community-based organization is through establishing a *networking structure*. As emphasized by Nunan (2006) bringing local-level organizations together is critical for effective natural resource management and in order to build the voice of the BMU members to influence lake-wide decisions, local government plans and activities, and national government policy, legislation and programs. The BMUs links or network is highly needed in Lake Victoria Tanzania as will be discussed in the next chapter on how BMUs can help to implement the role of first-hand sales management.

The idea of forming BMUs associations is highly accepted lake-wide in the country (Coordinating Office 2007). Currently the efforts already started, where Misungwi, Geita and Ukerewe districts have already formed their associations (ibid).

## Chapter Six

### THE FIRST-HAND SALES SYSTEM IN THE NILE-PERCH FISHERY

#### 6.1 The distribution channels of Nile perch

In Lake Victoria, the fish production is mainly dominated by artisanal fishers and the fish trade is usually undertaken at landing sites which are big enough to accommodate many boats, fishers and traders. There are about 575 landing sites according to the 2004 frame survey in the Tanzanian part of Lake Victoria which are spread over 1,150 km of coastline. Out of these 575 landing sites, 53 beaches were identified for gazetting and improvements of infrastructure like a floating barge, clean water, containers for holding ice and office for site management (Lukanga and Mgaya 2005).

Currently both the fish production and the marketing in most beaches operate in an environment of lacking necessary infrastructure like cold storage facilities and services to support the smooth running of the fish business. Since fish is a perishable product, this forces all fishers to depend on the processing plants and their agents since they are the main buyers of their fish and at the same time suppliers of facilities like ice and containers for fish storage.

Luomba (2007) reported that on average fish agents can make up to four trips per month delivering fish to the processing plants. Agents with trucks use up to five days for fish collection and purchase while for agents with boats it takes six days in order for them to have a large enough quantity for delivery to the processing plants. The report also indicated that both agents and fishers depend on getting ice from the processing plants; most agents get the ice for free while there are few agents who buy ice for 0.2 US\$ per kilogram from the processing plants.

Thorpe and Bennett (2004) defined the fish supply chain as a set of interdependent agents (fishers, processors and distributors) that work together, consciously, or unconsciously, to convey a fish derived product to the eventual consumer.

In Lake Victoria Tanzania; the fish supply chain of first-hand sales of Nile perch fish constituted by fishers, fish agents, fish mongers, bicycle traders, fish processing plants, local processor and local final consumers.

Around the Lake Victoria there are very few fishers who directly can supply their fish to the processing plants. According to the regional fisheries officer, the large fishers are less than 50 in total number and they are also capable of buying fish from other small-scale fishers in order to supplement their catches before delivering to the processing plants. As stated in the theory chapter, fish mongers who supplied fishing gears to fishers also have a guarantee of fish supply from the fishers and these fish mongers sell to the fish agents. We also find a number of small fish mongers with no guarantee of fish supply.

Small fish mongers always sell their fish to bicycle traders and local processors and mainly depend on fish taken by crews for personal consumption, fish rejects and undersized fish from well established fish mongers. Wilson et al. (1999) also noted that when plant agents are present, they take all the decent-sized perch and make local processors, usually women and bicycle traders, rely on fingerlings. This can be seen as a side effect of the globalization of the Nile perch fishery.

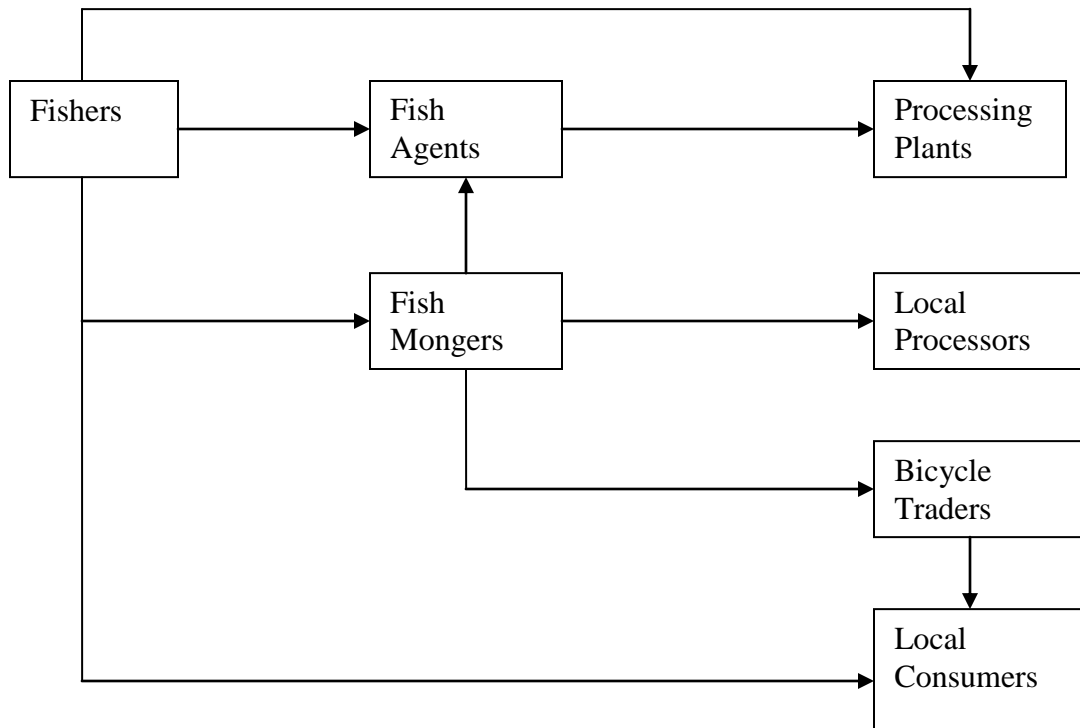


Figure14. The distribution channel for first-hand sales of Nile perch fish in Lake Victoria, Tanzania. (Source: FGD 2007).

Few fishers sometime sells their fish to local consumers although these are not preferred by many fishermen since local consumers always are unable to buy fish at higher price compared to the middlemen. During the fieldwork these were among of the complaints raised by the village chairman of Igalagala beach, one of the sites visited:

*“Fishers only value to sell their Nile perch fish to the processing plants; sometime they even refuse to sell mboga<sup>12</sup> to people in the village even if someone is willing to pay the same price that is offered by the middlemen”.*

## 6.2 Problems associated with the current first-hand sales system

In Lake Victoria the processing plants are the *single players that determine the fish prices* for all chain members, and fishers are the most disadvantaged group because the fish prices tends to go down as the number of intermediaries increase. The issue of fish prices affects both fishing boat owners and their crews. In Lake Victoria the common methods

<sup>12</sup> Mboga: Swahili word which implies any kind of sauce including fish for family use.

of paying crews are through sharing the income generated from fisheries or a share of the catch (Onyango et al. 2006; Wilson et al. 1999).

Crews constitute the majority of fishers and many of them have started fishing as an activity of last resort, that is, when they do not find any other employment alternative. In the baseline survey which was undertaken in 2006, it was found that on average crews get an income of Tshs 172.95 (approximately to 0.1485 USD) per week, which is an extremely low income. The fish which is usually taken by crews for personal consumption is used to supplement their daily income because in the end they always sell it.

The competition for fish supplies among the processing plants is intense, but lack of organization among fishermen and other players has made them unable to command the price setting for their scarce resource. Interview with the regional fisheries officer confirmed that all the processing plants at Lake Victoria Tanzania are operating below the processing capacity, due to low fish supply. Onyango (2004) reported that the ten processing plants operating in Lake Victoria Tanzania had capacity of 960 metric tones per day, but they were operating on a capacity of 435 metric tones (equivalent to 45%) per day. The table 5 below shows the analysis of the operating capacity of ten fish processing plants in Lake Victoria Tanzania:

Table 5: Operating capacity of ten fish processing plants in Lake Victoria Tanzania:

<b>Plant</b>	<b>Installed capacity</b>	<b>Operating capacity</b>	<b>% Operating capacity</b>
1	70	35	50
2	75	20	27
3	150	40	27
4	150	100	67
5	140	60	43
6	100	65	65
7	120	30	25
8	70	40	57



9	15	5	33
10	70	40	57
<b>Total</b>	<b>960</b>	<b>435</b>	<b>45</b>

Source: Onyango (2004).

The processing plants, agents, and fish mongers used to offer credit to fishers in return for regular fish supplies, and this capital dependence among fishers has made them unable to influence the fish prices. During the FGD fishers at Mihama beach said that:

*“Without the help of the government, it is difficult to influence the price change because the majority of us we are owned by these agents and the processing plants”.*

On face-to-face interview with representatives of the three fish processing plants; both argued that they set the fish price according to the *law of demand and supply* which implies that they offer higher price when there is low fish supplies and vice versa.

It has also been found that usually there is no formal agreement on credit received by these fishers. The majority of fishers just supply fish, usually at lower price compared to the prevailing price, without knowing for how long they will be keep servicing the loans.

During the fieldwork the price range was between to Tsh 1,400 to Tsh 1700 per kilogram of fish (Nile perch). Fishers were complaining that the *price is very low* compared to the daily fishing operating costs.

Agents and fish mongers also have been blamed for using *faulty weighing scales* in measuring fish during the purchase of fish (Onyango et al. 2003; Yongo et al. 2005). Some officials and owners of the processing plants believed that the use of faulty weighing scales has been exacerbated by agents who need quick wealth accumulation while they have been in business within a short period of time.

During the fieldwork both fishers and middlemen (agents and fish mongers) reported that the problem of using faulty weighing scales starts from the processing plants, an allegation that was strongly opposed by representatives of the processing plants.

Agents confirmed that it is true that they are using faulty weighing scales and the reasons for that were stated as to compensate for the loss they incurred from the processing plants because of their use of faulty weighing scales too, and fish rejects. One of the respondents (agent) at Mihama beach said that:

*“Agents are like processing plants slaves; even if we will take a live fish to the processing plants, rejects will never miss. All the processing plants are using faulty weighing scales and it is like are tempered by one professional person”.*

It was further reported that for the fish purchased by agents on a price range stated above in the beaches the processing plants will later buy the same fish for the price of 250 to 400 Tshs per kilogram as *rejected fish* (FGD 2007).

Fishers and agents both believed that this is the technique used by the foreign investors to exploit them. Agents explained that they usually not participate fully in the whole processes of weighing of their fish at the factory and therefore can not identify the amount of fish rejected from their own consignment but they received papers to sign to rectify that the whole processing of weighing and sorting reject fish was mutually done and fair for both parties.

It was also found that the *richest agents monopolize the fish trade at beach level*; they are the ones who set the fish prices on behalf of all other small agents and fish mongers, and decide on which weighing scales can be used to weigh fish on the beaches. The problem was serious at Kayenze beach, where only one weighing scale of the richest agent was being used, and the fishers were complaining that the weighing scale was very old and it is even very difficulty to read the weights and therefore agents just estimate the weight of the fish and fishers felts that they loose money due to incorrect weighing.

*High price fluctuations* were among the problems stated by respondents in association of the current sales system. Despite the complaints from fishers on low fish prices, during the high fish supply the price tends to go down with high degree of fluctuations. Lack of formal agreements between the processing plants and some agents has been stated as factor that contributed to this problem. Some agents were complaining that sometimes the processing plants can ask agents to bring fish at a certain high price but on delivery the plants refuse to pay on such agreed price and instead buy fish at a reduced price. As a result when agents went back to the beaches they will make sure that they drop the price to fishers in order to compensate the previous loss incurred to the processing plants.

Lack of fisher organizations and a board to govern the fish trade were stated by the fishers as the major causes of the above problems associated with the current fish sales system. A board with the responsibility of governing the fish trade at both national and international markets to oversee the economic conditions and development of the whole fisheries industry was highly recommended by fishing communities during the fieldwork. Since the Nile perch has developed into an international commodity, this implies that fishers and processors are now competing for market shares within a *global* market. Fishers feel that the board will help in coordination of the fish trade and promote the information accessibility to all players in the fishing industry. Currently the fishers get information about the world market from agents and the processing plants, although such information is not used as a basis for price setting.

For both members of the fish chain to gain the competitive advantage of the global market, access and use of market information is essentially required. Both fishers and processors need information about the consumers' behaviour in a specific market segment in order to serve that segment with the right quality and quantity of fish products at the right time.

In the world economy consumers' behaviour patterns have become a centre of competitiveness and they exert a strong influence over the chain structure and operation of the fish industry and therefore both producers (fishermen) and processors will need to cooperate in order to serve the market efficiently and effectively.

Fishers also stated that lack of commitment of some government officials responsible for fish quality and those responsible for checking the weighing scales also contributes to the problems of fish rejects and use of faulty weighing scales; the complaints which have been defined by most fishers as corruption during the fieldwork

Agents said that most of fish that were identified as rejects by the processing plants usually are then frozen and sold within the country, especially in Dar es Salaam, instead of being returned to the agents who delivered such fish. Respondents at Mihama and Kayenze beaches said that:

*“Its not possible for us to ask for our fish rejects since even the truck we are using to deliver the fish belongs to the processing plants and therefore they will not allow their truck’s to take such rejected fish and sell to other local market. Instead they buy for the price of 250 Tsh per kilogram and freeze and sell for 4,000 Tsh per kilogram at Mwanza airport market to passengers going Dar es Salam”.*

This was also confirmed by the processing plants, stating that usually there are ready markets for fish rejects, and the processing plants always help the agents to sell such rejects on these markets.

The survey of fish agents which was undertaken on November 2007 reported that on average each agent get 300 kg of fish rejects per trip, and out 61 agents interviewed 79 % stated their rejected fish to be taken by the processing plants at the price range of 0.2 – 0.3\$ per kilogram.

It is a responsibility of the fisheries division to handle the issue of fish rejects in order to meet the fish quality specification of the international market. That is why both agents and fishers feel that the government officials receive bribes and leaves the processing plants to do whatever they want in order to maximize their benefits and make the fishery activities unprofitable to other members in the fish chain.

In Tanzania the role of authentication and control of the weighing scales used in measuring different products is handled by the Weights and Measures Agency under the ministry of industries and trade. Fishers felt that the staffs of that agency are the most corrupt officials, not being responsible for handling the problem of faulty scales both at the beach and at the industrial level.

In order to solve the problem, it is proposed that all BMUs should own the accepted weighing scales and a law that will restrict all fishers and agents to use only these scales should be established by the local authorities. This was among the recommendation that were given by both fisheries managers and the fishers community too.

Under the decentralized system, each district in Tanzania is responsible for collecting different taxes and fees as sources of income in order to supplement their budgets. Use of faulty weighing scales has been identified as a major problem that causes the government to loose a lot of income from the landed fish in Lake Victoria. Currently the government is charging 7-8 Tsh per kilogram of fish landed which is taken by the local councils, and there are also others fees charged to fish traders by the revenue authority that are taken to the central government. It was estimated that the local government's revenue collection is around Tshs 656,300,000 per year which can be increased to Tshs 1,603,500,000 with an improved revenue collection system (Hoza and Mgaya 2005).

### **6.3 The capability and aspiration of BMUs to improve the first-hand sales system**

The dilemma of market disempowerment is now a global problem in most countries that are implementing various forms of fisheries co-management (Jacinto 2004; Nielsen and Vedsmann 1997). While the problem in most countries are embedded with the phenomenon of rapid global economic integration, in Tanzania is much associated with lack of representative fishers' organization in marketing issues. As one way to solve the problem government officials, fishing communities and the processing plants have shown the strong desire of BMUs to undertake marketing activities in order to improve the market performance of the fishing communities and the fishers' income in general. Most

processing plants usually offer loans to fishers, but the processing plants sees dealing with BMUs instead of individual fishers will reduce the risky of their monies given as loan to disappear since some fishers run away. The manager of a Nile perch processing plant stated that:

*“Most of our fish we get directly from the fishermen and we had given them loan in form of the fishing gears, It will be good arrangement to deal with BMUs because even if fishers have our loan sometime they decide to sell fish to other processing plants or run away”.*

The current first-hand sales system has shown to be a major contributory factor of low income to fishers and therefore the following is a list of activities which were proposed by respondents to be undertaken by BMUs as a strategy to improve the fishers’ market performance and their income in general:

1. Deliver market information to fishers and break the gap between fishers and factories.
2. Establish by-laws in relation to fish sales.
3. Offer credit to fishers in order to avoid capital dependence to middlemen and processing plants.
4. Frequently conduct stakeholder meetings in order to discuss different issues related to fish markets and resource management.
5. Coordinate negotiations and any agreement in relation to fish prices and loans undertaken between fishers, middlemen and the processing plants.

As has been stated by Nielsen (1996) co-management arrangements can be perceived in relation to market activities, whereby relations between fishermen and buyers come into focus. Community based organizations like BMUs will need the capacities in financial resources, structures and professionalizing in policy and marketing level as current and future requirements in order to be able to perform their roles and responsibilities in both resource management and marketing of their fish and fish products.

During the fieldwork it was found that currently the BMUs' capability in coordination, advocacy and networking for the benefit of its members is enhanced through attending different meetings and seminars, establish cooperation with some NGOs, exchange visits between BMUs, organize joint patrols and community sensitization activities between BMUs. Therefore frequent forum meetings for the BMUs to discuss issues in the fisheries sector and management issues will also help them.

### **6.3.1 Current requirements for BMUs' capabilities to improve the first-hand sales system**

Financial resources, enabling BMU structures and legal backing are requirements that are immediately needed in order for the BMUs to undertake the additional responsibility of fish marketing.

As indicated in the previous chapter most BMUs are lacking the *financial capabilities* in order to cover their administrative costs and undertake most of their roles in resource management. In order to improve the market performance of fishers, the most demanding role which was stated by respondents was the ability of BMUs to issue credit to its members in order to reduce the problem of capital dependence to the middlemen and the processing plants. Such a role for the BMUs to be credit lenders will require a large amount of money as starting capital. During fieldwork respondents proposed that the local councils should be responsible to return part of the monies collected in fishing communities in form of fees and taxes in order to support the economic development of such communities; and that monies can be used as seed money for issuing credit to fishers by the BMUs.

Most of the financial institutions perceive the fisheries activity as risky business and they are therefore reluctant to give loans to the people involved in the fisheries business. The risks are associated with lack of safety at sea and short time-frame for wear and tear of most fishing gears which can be used as collateral security. Therefore the savings and credits schemes that are embedded with fishers' life style and nature of their fishing activities are highly recommended by respondents in order to be affordable and

convenient for the fishing communities. The BMU organizations can be a perfect organization to implement the microfinance activities as it is formed by the fishers themselves.

A levy on all first-hand sales of fish should be introduced in order to enable the BMUs to cover the administrative costs of both marketing and resource management activities. This is possible once the organization has managed to influence the fish price change since the fish prices remain as the single most important factor that has hindered the individual fisher's development due to its low level compared for example to the artisanal mining of gold and tanzanite (Onyango 2005).

Under the fisheries act No 22 of 2003 and the BMU's national guidelines; the beach level is the known area for jurisdiction for BMU's operations in fisheries management activities. An *enabling BMU structure* that will link all BMUs in the Lake Victoria zone was proposed by the respondents for effective and efficient implementation of a co-management approach in both resource management and marketing activities. Most of the Nile perch processing plants are located in the Mwanza region and therefore even though there are current efforts for the formation of BMU associations in each region, an umbrella BMU association with the overall mandate for price negotiations in order to ensure high and stable prices and reliable terms of payment for all fishers in lake zone will be required.

The experience of the Kenyan cooperatives' failure to support fishers in areas of fishing gears, pricing, control of the illegal fishing and the insecurity in the lake contributed much to its members (fishers) relying much on the fish agents and the processing plants (Mitullah working paper No. 87). The *legally protected* BMU association was therefore proposed by respondents for the newly formed umbrella BMUs association in order to undertake the marketing activities like price negotiation and as the only way that can truly empower fishers through improved market performance.



### **6.3.2 Future requirements for BMUs capabilities to improve the first-hand sales system**

Nilsen (1996) explained that an effective organization needs to have the capability of performing within a “negotiated economy”, and should be able to foresee legislation and regulations even before they have been initiated, in order to act in the interest of its members at both national and international levels. For BMUs to have such capability they will need to upgrade skills and qualifications by *professionalizing the organization at the policy level*. The organization will require highly-skilled staff with the capability to communicate in an international environment and an ability to translate knowledge in order to achieve the organization’s objectives.

It has been proposed that the fisher’s organization like BMUs can form links with decision-makers, institution and groups with specific knowledge and can draw on external expertise and information in order to position their organizations in a strong strategic position (Nilsen and Vedsmand (1997).

The strong influence of consumers in the global market needs fishers’ organization like the BMUs to *professionalize the marketing level*. Both organization staff and fishermen need to exchange information with processors and traders in order to meet the consumers’ demands with exact amounts and qualities at the right time. Therefore through their organization, fishermen will need to upgrade their knowledge base in order to achieve a maximum use of the available fish resources.

A professional BMU association can support and undertake external marketing and promotion activities based on well prepared concepts and marketing strategies. They can achieve this by establishing linkages with other organization and institutions and exchange market information. The organization can conduct internal campaigns, education and training programmes to enhance the members’ knowledge in order to meet current and new demands (Nilsen and Vedsmand 1997).

Currently, in order to meet the specification of the global market of Nile perch fishery Thorpe and Bennett (2004) reported that although fishermen are located at the base of the

fish chain, the design and management of the ensuing national chain strategy largely rests in the hands of industrial processing plants, especially in the meeting of specific international consumer preferences. Even under trade liberalization; government through its fisheries authorities and in collaboration with all members in the fish chain will need to participate actively for the assurance of a market share in the global and national markets.

## Chapter seven

### DISCUSSION

#### **7.1 The need of improving fisher's first-hand sales performance for poverty reduction**

The market disempowerment has proved to be a critical problem in most countries implementing various forms of co-management. As stated in the SLA framework; the livelihoods assets including the natural capital (fish stock) and activities associated with it can be hindered by policy, institutions (markets, organization and social relation); and its processes which includes decentralization, participation and market liberalization. In a country like the Philippines fishing communities responded positively on the co-management arrangements and now started to complain: *“the fish have come back but the buying price in the market has dropped so we're no better off than we were before”* (Jacinto 2004: 1).

While in Lake Victoria fisheries, the fishing community response towards the resource management efforts is still in question. The poverty among the fishers makes them choose the short-term objective of getting a meal for today and forego the long-term objective of a sustainable fisheries resource. The fish prices and others problems that fishers encounter in selling of their fish, such as the use of faulty weighing scales and fish rejects; turn out to be not only the major contributing factor of poverty in the fishing communities around Lake Victoria but also a barrier for successful implementation of co-management.

Onyango (2004) explains that the persistence of poverty among the fishing communities around Lake Victoria; makes them adopt different strategies in resource utilization, including the use of illegal gears like beach seines in order to sustain their daily lives. In chapter six it is shown that the first-hand sales problems affect the income of both boat owners and their crews. Since the number of crew members is greater than boat owners, the problems of first-hand sales have greater implication in resource management and poverty reduction efforts in fishing communities. Illegal fishing will never stop unless better fish prices and fair distribution of benefits and rewards of fish resources are

achieved, co-management and other management tools like limiting the access will be difficult to implement in the small-scale fisheries around Lake Victoria.

The report of year 2005 for frame surveys (2000, 2002 and 2004) undertaken in all three countries sharing the Lake Victoria resource indicates that the illegal fishing of beach seines keep increasing in Tanzania and Uganda, and use of monofilaments nets which also is illegal for all three partner states also shows to increase despite the greater efforts that are undertaken by all three governments and development partners in order to achieve sustainable utilization of the lake's resource. The fishing pressure keeps increasing because of less income realized from the fishery compared to the high demand of fish in the processing plants.

The fact of less alternative economic opportunities in the fishing communities can not also be denied and therefore their life is highly dependent on the fishery resource. Poverty reduction efforts should be directed on empowering fishers to increase the benefits and rewards over the resource since it is the immediate means that they depend on. The experience shows that, through legally protected fishers' sales organizations it is possible to make the fishery activity profitable to all members in the fish chain. For example the Norwegian fishermen association has achieved to have an arrangement of minimum fish prices in first-hand sales through negotiations with the fish buyers' organizations for all kind of fish species and have reliable terms of payments to all fishers.

In developed countries co-management arrangement known to help fishers in getting their rights over resource utilization like on getting quotas and conflict resolution among the resource user-groups; while in developing countries like Tanzania the integration of co-management and poverty reduction measures is crucial. As emphasized by the SLA framework, any poverty reduction measures should be *built on strength* of that community. Fishing is considered to be a very important livelihood activity in these fishing communities, and therefore efforts to reduce poverty should be integrated with these fishing activities as a livelihood strategy in order to achieve sustainable benefits from the resource.

Improving the marketing performance and making the fishery profitable to communities where their livelihoods depend on this fishery resource can be formulated as livelihood strategy for poverty reduction in the small-scale fisheries. Proper utilization of income realized from fishery and other development plans in the fishing communities should also be emphasized as all these factors contribute to poverty in the fishing communities.

## **7.2 BMUs' activities and members**

Despite it has been stated in the Fisheries Act no. 22 of 2003 and the BMU's national guidelines about activities and key stakeholders that forming the membership of BMU organization; these two major issues need to be clearly revisited so that community expectations like getting better fish prices, and access to financial resources can be integrated with co-management arrangements and improvement in their participation in all activities relating to resource management.

The issue of *less community support to BMU activities* raised by some BMU committees should not be underestimated. Among the rationale for co-management is the increase of efficiency in terms of time and monetary costs by expecting that some management activities will be performed by the resource users themselves, and experience shows that these are highly influenced by the sense of ownership and the perceived benefits of the programme to the partners involved.

Statements like *"BMU brought by government and all fishers were required to register and sensitized that the organization will bring benefits to us, offer credit and have better price for our fish"* can be perceived that the institutionalization of the BMU organization ignored the explicit principles of democracy and justice for the formation of free and autonomous, legitimate community organization. Although it is known that co-management can evolve through both top-down and a bottom-up process; but in Lake Victoria fisheries the contribution of fisher's community on how the co-management can be implemented in their fishery is invisible.

During the planning of co-management arrangement in Lake Victoria; the identification of problems, needs and opportunities was not mutually done between fisheries authorities and fishers community. The two issues of better fish prices and credit which were like promises given to the community influenced the majority of fishers to join the organization as demonstrated in chapter five with little motivation in the participation of resource management activities.

Nevertheless, from definitions given by the communities during fieldwork indicate that the fishing communities understand the need of their participation in resource management for the sustainability of the fish resource. Therefore their participation in resource management through sensitization and awareness programmes on proper fishing methods and practice, conducting patrols and taking catch data should be encouraged. Although the organization lacks the capacity of conducting the patrols; this activity is very important for the fishing community since it serves two purposes; first to fight illegal fishing and second it assures the security of the fishing boats and gears during fishing. The number of fisheries staff is very low to handle the activities of conducting patrols and taking catch data all around the lake. The above mentioned activities need active participation of all members in the BMU organization. Conflict resolution and fish quality and hygiene are activities that should continue be managed by BMU committees at beach level. The ability of co-management institutions to solve conflicts that may occur among the resource user-groups and stakeholders is the one of the advantages of implementing a co-management approach (Jentoft in Hersoug et al. 2004).

The BMUs cannot handle everything on the beaches since it needs time and resource capacity. Also it should be born in mind that the committee members work on a voluntary basis and therefore they still need private time in order to continue with their fishing activities to sustain their lives. Activities like environmental protection and beach sanitation, registration of fishers and their fishing crafts can continue to be handled with other authorities. The BMUs can help to deliver information to fishers about the registration activities while the fisheries division undertakes the registration activities as they have usually done. The private organization that collects taxes and fees at the beach on behalf of the government should have the responsibility of environmental protection

and beaches sanitation as one way of returning part of the income collected at the beaches.

Before the BMU reformation which was undertaken in year 2006, all BMUs which had savings and credit schemes were active and functional. Therefore the activity of microfinance at beach level should be encouraged since it helps the fishing communities in financial difficulties regarding economic and social activities in the communities. Although the microfinance activity has no direct contribution on resource management, it has an effect on poverty reduction efforts and the issue of the accessibility of financial sources to fishers in order to be able to buy the legally accepted gears for the fishing activities. And also the activity will save as long –term source of fund for BMUs organizations as stated in other chapter instead of BMUs being involved with taxes collection tenders and contradict with fisheries regulations like slot size. Some BMUs are blamed in accepting the undersized fish just to meet their bids for taxes collection in the district's council.

The other activities of first-hand sales like price negotiations and fighting for better and reliable terms of payment could be handled by the Lake Zone BMUs' association as was proposed by the fishing communities during my fieldwork. Under the support of branches in each region of Mwanza, Mara and Kagera, activities like ensuring fair business practices between fishers and the processing plants, catch data collection in the processing plants and adherence to the slot size regulation can be undertaken by this BMU association i.e. by its branches.

Legally boat owners, crews, traders, processors, boat builders and repairers and net repairers are the primary stakeholders identified to form the BMU organizations in the beaches. Pomeroy and Guivera (2005) defined stakeholders in community-based co-management as individuals, groups or organizations of people who are interested, involved or affected (positively or negatively) by the use and management of fisheries resources. In fisheries there may be different stakeholders depending on their interests, their ways of perceiving problems and opportunities concerning the resources, and

different perceptions about the needs for management. In order for BMUs to undertake the first-hand sales activities; the issue of BMU membership will need to be revisited.

The middlemen (fish agents and fish mongers) are BMU members, but they are also accused of contributing to a lot of problems that currently are happening in the first-hand sales in the Lake Victoria fishery. Most middlemen own fishing gears in order to have a guarantee of fish supplies; therefore they should choose whether to benefit from the fish resource as truly fishers or participate in the fishery as middlemen commissioned by the processing plants. Theoretically middlemen are known to generate profit by buying and selling products at higher prices. But in Lake Victoria fishery it is opposite; middlemen have no influence on the fish prices instead they generate profit by reducing the fish prices offered by the processing plants as the major buyers of the Nile perch. Since such business practice show to have great impact on the fishers' income which in turn affect the utilization of fishery resource, their membership in the organization should be redefined in order to have an institutional set-up that will promote the fair redistribution of benefits of the fisheries resources while strengthening the community participation in the management of the resources.

### **7.3 BMU's capacity and capacity building**

In chapter five and six it is shown that the BMU organizations lack the capacity for both resource management and first-hand sales activities. The organization and its communities lack the financial resources, knowledge and skills required for active participation in fisheries resource management activities and the new role of improving the first-hand sales system.

Although there is on-going training of committee members in order to be able to master their roles and responsibilities regarding resource management, the activity need to be broadened and include an awareness and sensitization programme at community level on accepted fishing methods and practices, community roles and responsibilities as BMU members and other environmental education. Both BMU committees and community members need to be *empowered* in order to take their responsibilities seriously and in



order to act effectively to safeguard the fishery resource. The capacity-building process should enable both individuals, groups, organizations, and the whole fishing community to increase their abilities to: (1) perform core functions, solve problems, define and achieve desired objectives over time; and (2) understand and deal with their development needs in a broad context and in a sustainable manner (Pomeroy and Guivera 2005).

The capacity-building is an on-going activity and the fisheries authorities (research and management) will need to continue with capacity building activities especially in conducting training and awareness programmes to other government officials and staff that need to collaborate with the fishing communities, BMU committees and community members over fisheries related matters. Other issues related to first-hand sales can be done by other organizations that have sufficient resources and time to undertake such activities.

In Tanzania there are a number of organizations that have experience in conducting training in marketing and micro-finance issues that can help the BMU organizations to acquire the knowledge and skills in order to take greater control over the marketing of the their fish and negotiate a fair agreements for the betterment of its members and the whole fishing community.

The fisheries authority will be required to supervise the activities undertaken by these organizations to ensure that the overall goal of achieving sustainable utilization of fishery resource is not jeopardized especially in the development of the training modules.

The capacity-building activities need large amount of financial resources, the support from government and development partners is highly needed. Currently the financial contribution of government to co-management issues is very minimal, but in order to have positive results of co-management the government commitment in financing the programme once the development partners have faced out their contributions is vital.

## Chapter 8

### CONCLUSION AND RECOMMENDATIONS

#### 8.1 Conclusion

The study was set out to examine the possibility of implementing the market-oriented fisheries co-management in Lake Victoria (Tanzanian side) for Nile perch fisheries. The community-based organization BMU was selected as fishers' representative organization in order to investigate how it is possible to improve the fishers' market performance and reduce poverty in the fishing community.

The poverty persistence among the fisheries community in small-scale fisheries is worldwide known, and the continuous increase of fishing pressure despite the reported overexploitation of the most world fisheries poses great challenges to the management of these resources. Co-management is the management approach that has received much attention in Lake Victoria fisheries, but the findings of the study have indicated that the market disempowerment of the fishers' community over their fish has contributed to their poverty situation and threatens the sustainability of the BMU organization. The BMUs are the organizations that bring together people involved in fisheries to work in collaboration with government and other stakeholders in managing the fisheries resources and improving the livelihoods of the fishing communities. Around the Lake Victoria (Tanzania) there are now 433 BMUs.

A number of the research questions were designed in order to meet the objectives of the study. They were all centred on the BMUs' current performance and the first-hand sales systems in ten field sites of the Mwanza region.

#### 8.1.2 BMUs' performance and capacities in resource management

The study found out that there are a number of activities in resource management that are currently undertaken by the BMUs. Most of these activities are undertaken by the BMUs' committee members with relatively little support from other members in the fishing community. The BMU organization lacks capacities in both knowledge and skills for

resource management, financial and material resources. And it was also found that the fishing communities have little knowledge about the nature and trends of the fish resource, and little motivation to participate in the BMUs' resource management activities, a fact that seems to be a major threat to co-management arrangements in the Lake Victoria fisheries.

### **8.1.3 The aspiration of the BMUs to improve the first-hand sales system**

Currently the BMUs are doing very little on the issue of first-hand sales, just the handling of fish quality and hygiene. Issuing of credit and fighting for better fish prices for its members were the most frequently proposed activities for the BMUs, mentioned by the fishers. The first-hand sales key players for Nile perch fishery were identified as the fishers themselves, the processing plants, the middlemen and the local consumers.

The study also found that, the use of faulty weighing scales, low fish prices which were also determined by a single player (the processing plants) and fish rejects are the major problems that the fishers are facing in relation to the current first-hand sales system. Lack of board to govern the fish trade and fisher's representation in major issues regarding the fish business was mentioned as the causes for the identified problems in relation to the first-hand sales system.

The fisheries managers, fishers and the managers of processing plants all support the idea of BMUs to be involved with the first-hand sales. But in order for the BMUs to improve the first-hand sales system; an umbrella BMU organization was proposed to be formed which will link all BMUs in Lake Victoria Tanzania. This organization will be in charge of the BMUs' marketing activities, especially in the coordination of the fish price negotiations and in promoting market information to all members in the fish chain.

From the lessons learnt from the Norwegian Fishermen's Association; the umbrella BMU sales organization will need to be legally protected, as the current business practice has implied that the majority of fishers lack freedom in business operations due to the capital dependency of the processing plants and the middlemen.

The above mentioned are short-term requirements, but in the future the BMUs' sales organization will need to professionalize itself in policy and at the marketing level. All the requirements need the financial capacity which is already stated that the BMU organization lacks such capacity.

#### **8.1.4. The lessons learned**

In both phases of co-management implementation in the Lake Victoria fishery on the Tanzanian side (first the establishment of BMUs and then its reformation); the issue of problems, needs and opportunities identification in the fishing communities was ignored. The deliberate decision of not taking into account the problems of the fishing communities in the co-management arrangements has made the fishers less motivated to participate in resource management activities.

Although it is legally stated that the BMU organizations can participate in economic development activities for the benefits of its members, currently much efforts is directed only on empowering the organizations to actively participate in resource management activities. The poverty situation in the fishing communities has led them to choose the short-term priority of getting daily income to sustain their lives from the resource rather than the long-term objective of sustainable fisheries, as desired by both government and development partners in the co-management approach.

Through integrated fisheries co-management; resource management and poverty reduction initiatives can help to motivate fishing communities to participate actively in co-management arrangements. And market empowerment can be among the most important livelihood strategies which can contribute to poverty reduction in the fishing communities and solution to long-term funding for community-based organizations like the BMUs, as was explained in chapter five and six.

I have also shown that the current Nile perch business practices have primarily benefited a few owners of the fish processing plants and middlemen while the majority of fishers

remain poor and they are operating indebted throughout their lives. There is little government attention on the fishery sector; and focus is only on the revenue (taxes) the government can get from the sector without thinking on how the institutional setup especially in the marketing system of the fish and fish products can be strengthened in order to improve the contribution of the sector to the overall national economy and the poverty reduction efforts. The first-hand sale is an area that has been completely forgotten, and the managers and owners of processing plants and the middlemen are the ones dominating the industry by making the most important decisions in the first-hand sales system, like setting the fish price.

## **8.2. Recommendations**

- (a) An intensive and continuous community awareness raising and sensitization on the nature and trends of the fisheries resource, and their roles and responsibility as BMU members in co-management arrangement is highly needed.
- (b) A study should be done to analyze the costs and benefits to all stakeholders involved in the first-hand sales of the Nile perch fisheries.
- (c) A study should be done to find out whether the market-oriented fisheries co-management can act as a livelihood strategy in small-scale fisheries, especially in developing countries.
- (d) An immediate government intervention and investigation is needed to find out what are the major causes for the problem of high degree of fish rejects in the processing plants. Although the problem is mostly perceived by the fishers and the middlemen as unfair business practices performed by the processing plants; the problem might also threaten the reputation of Nile perch products on local and international markets.
- (e) The establishment of the board of the fish trade and fishers' sales organization is vital in order to improve the contribution and performance of fisheries sector in the national economy and poverty reduction in the fishing communities.

(f) Apart from market empowerment of the fishing communities, other problems, needs and opportunities should be identified and consensus between the government, development partners and communities should be sought on which issues that can be incorporated in the current co-management arrangements and which can not be incorporated.

## REFERENCES

- Arunga, J. (1981). A case study of the Lake Victoria Nile perch *Lates niloticus* fishery. In proceedings of the Workshop of the Kenya Marine and Fishery Research Institute on aquatic resources of Kenya, 13-19 July 1981, Mombasa. Kenya National Academy for the Advancement of Arts and Science, pp. 165-183.
- Allison, E.H., and Ellis, F. (2001). The livelihoods approach and management of small-scale fisheries. *Marine policy* 25(2001), pp. 377-388.
- Allison, E.H., and Horemans, B. (2006). Putting the principles of the sustainable livelihoods approach into fisheries development policy and practice. *Marine policy* 30(2006), pp.757-766.
- Athaia – <http://athaia.org/tanzania-population.html>
- Biglaiser, G. (1993). Middlemen as expert. *The RAND journal of Economics*, Vol.24, No.2, pp. 212-223.
- Bwathondi, P.O.J., Kulekana, J.I. and Mwamsojo, G.U.1 (1991). Survey and monitoring of the fishery of Mindu Dam a man made Lake in Morogoro, Tanzania. Unpublished report.
- Bwathondi, P.O.J. (1991). The fisheries resources of Lake Victoria. Paper presented to the National Seminar on the Fisheries of Lake Victoria, October 1991. Mwanza.
- Biglaiser, G., and Friedman, J.W. (1994). Middlemen as guarantors of quality. *International journal of industrial organization* 12(1994), pp. 509-531.
- Bulayi, M. E. (2001). Community based co-operative fisheries management in Tanzania. Masters thesis submitted at Iceland University.
- Béné, C. (2003). When fishery rhymes with poverty: A first step beyond the old paradigm on poverty in small-scale fisheries. *World Development* Vol.31, No.6, pp 949-975.
- Bolton, P., and Dewatripont, M. (2005). *Contract theory* (ed). Cambridge, Mass.: MIT Press.
- Cadwalladr, D.A. (1965) Notes on the breeding biology and ecology of *Labeo victorinus* Boulenger (Pisces: Cyprinidae) of Lake Victoria. *Revue de Zoologie et Botanique Afrique* 72,109-134.

COLMR-

[http://www.colmr.research.va.gov/mgmt\\_research\\_in\\_va/methodology/qualitative\\_research.cfm#6](http://www.colmr.research.va.gov/mgmt_research_in_va/methodology/qualitative_research.cfm#6)

DFID (1999). Sustainable livelihoods guidance sheet.

Fryer, G. (1973). The Lake Victoria fisheries: Some facts and fallacies. *Biological Conservation* 5(4), 304-308.

FAO (2000). Poverty in coastal fishing communities. Advisory committee on fisheries research, third session, Rome Italy, 5-8 December 2000.

FAO (2002). The state of the world fisheries and aquaculture (SOFIA) 2002.

<http://www.fao.org/documents/>

Fisheries Division (2006). Lake Victoria fisheries frame survey report. Ministry of Natural Resources and Tourism, (Unpublished).

Fisheries Division- <http://www.fisheries.go.tz>

Graham, M. (1929). The Victoria Nyanza and its fisheries. A report on the fishing surveys of Lake Victoria (1927-28). Crown Agents Colonies, London.

Gordon, H. S. (1954). The economic theory of a common property resource: The Fishery. *Journal of Political Economy* Vol 62. No. 2, pp. 124-142.

Garrod, D.J. 1961. The history of the fishing industry of Lake Victoria. East Africa, in relation to the marketing facilities. *East African Agriculture and Forestry Journal*. 27: 95-99.

Greenwood, P.H. (1974). The cichlid fishes of Lake Victoria, East Africa: the biology and evolution of a species flock. *Bulletin of British Museum of Natural History (Zoology) Supplement* 6, 1-134.

Hardin, G. (1968). The tragedy of the commons. *Science* 162. 1243-1248.

Hollup, H. (2000). Structural and social cultural constraints for user group participation in fisheries Management in Mauritius. *Marine policy* Vol. 24, No. 5, pp. (2) 407-421.

Hara, M., and Nielsen, J. R. (2003). Experiences with fisheries co-management in Africa. In Wilson, D. C., Nielsen, J. R and Degnbol, P. (eds.) *The Fisheries co-management experience: Accomplishments, challenges and prospects*. Kluwer Academic Publishers.



- Hoza, R.B., Mgaya, Y.D., and Bwathondi, P.O.J. (2005). Historical trends in fisheries management. In Mgaya, Y.D.T: Synthesis report on fisheries research and management, Tanzania. LVEMP.
- Jentoft, S. (1989). Fisheries co-management: Delegating government responsibilities to fishermen's organization. *Marine policy* 13 (2), pp. 137-154
- Jansen, E. G. (1997). Rich fisheries- poor fisher folk. Some preliminary observations about the effects of trade and aid in the Lake Victoria fisheries. Socio-economics of the Lake Victoria Fisheries Report No. 1. IUCN East Africa Program 1997.
- Jentoft, S. (2004). Fisheries co-management as empowerment. *Marine policy* 29 (2005), pp. 1-7.
- Jentoft, S. (2004). The community in fisheries management: experiences, opportunity and risks. In Hersoug, B., Jentoft, S. and Degnbol, P. (ed) *Fisheries Development: The Institutional Challenge*. Eburon Publishers.
- Jacinto, Jr. E. R. (2004). A research framework on value chain analysis in small scale fisheries.
- Katon, B., Pomeroy, R., Salamanca, A. (1997). The marine conservation project for San Salvador: a case study of fisheries co management research project Working paper no.23 Manila. ICLARM, 1997, pp.1-95.
- Kotler, P., and Keller, K.L. (2006). *Marketing Management* (eds). Pearson Prentice Hall.
- Ligtvoet, W., and Mkumbo, O. (1990). Synopsis of ecological and fishery research on Nile perch (*Lates niloticus*) in Lake Victoria, conducted by HEST/TAFIRI. *FAO Fish. Rep.* 430: 35 – 74.
- Lukanga, S.A., and Mgaya, Y.D (2005). Fish quality assurance. In: Mgaya, Y.D. T: Synthesis report on fisheries research and management, Tanzania. LVEMP.
- Luomba, J. (2007). Report on fish agents' survey in Lake Victoria, Tanzania. Implementation of a Fisheries Management Plan (IFMP) project for Lake Victoria.
- LVFO – <http://www.lvfo.org>
- Medard, M., Salehe, M.A., Kilosa, E., Shango, D., Ngowi, E. and Sweke, P. (2004). Report on identifying, analysing, and establishing BMUs in Lake Victoria – Tanzania.

- Mgaya Y.D., (2005). LVEMP. Synthesis report on fisheries research and management of Lake Victoria, Tanzania.
- Mlaponi, E., Mkumbo, O.C., Budeba, Y. L., Salehe, M. A., Ezekiel, C. N., Waya, R., Musiba, M., and Mbonde, A. (2008). Composition, biomass distribution and population structure of the fish stocks in Lake Victoria – Tanzanian side. Paper presented at International symposium, GLOW V. Great Lakes of the World and Rift Valley Lakes: Sustainability, Integrity and Management. April 26-30, 2008, Addis Ababa, Ethiopia.
- Mitullah, W.V. Lake Victoria's Nile Perch fish cluster: institutions, politics and joint action, IDS Working Paper No.87.
- Nielsen, J. R. (1996). Fisheries Co-Management: Theoretical aspects, international experiences and future requirements .Presentation at the annual Finnish Fisheries Conference 28-29 November 1996, Turku, Finland.
- Nielsen, J. R., and Vedsmand, T. (1997). Fishermen's organizations in fisheries management: Perspectives for fisheries co-management based on Danish fisheries. *Marine policy*, Vol.21, No.2, pp.227-288.
- Nunan, F. (2006). Empowerment and institutions: Managing fisheries in Uganda. *World development* Vol.34, No.7, pp. 1316-1332.
- OECD (2001). The DAC Guidelines: Poverty reduction, International development.
- Onyango, P.O., Salehe, M. A. and. Haule, T. (2001). Potential strategies to address fisher's problems in Lake Victoria, Tanzania. LVEMP.
- Onyango, P.O., Mahatane A. and Medard M. (2003). Report on Making Beach Management Units more effective. LVEMP.
- Onyango, P.O. (2004). Reforming fisheries management: A case study of co-management in Lake Victoria Tanzania. M.Sc. Thesis, Norwegian College of Fisheries Science, University of Tromso, Norway.
- Onyango, P.O. (2005). Socio-economics of Lake Victoria fisheries. In: Mgaya, Y.D. T: Synthesis report on fisheries research and management, Tanzania. LVEMP.
- Onyango, P.O., Salehe, M.A., and Mrosso H.D.J. (2006). Assessment of the Regional fish marketing channel for major commercial fish species of Lake Victoria, Tanzania. IFMP.

- Onyango, P.O. (2007). Contribution of Lake Victoria fisheries to Tanzania's economic growth, poverty status and development. IFMP.
- Pomeroy, R.S. (1995). Community-based and co-management institutions for sustainable coastal fisheries management in Southeast Asia. *Ocean & Coastal Management*, Vol. 27, No. 3, pp. 143-162.
- Pomeroy, R.S., and Berkes, F. (1997). Two to Tango: The role of Government in fisheries co-management. *Marine Policy*, Vol. 21, No. 5, pp. 465- 480.
- Pomeroy, R.S., and Rivera- Guieb .R. (2005). *Fishery co-management: A practical handbook*.
- SNV (Tanzania) Portfolio Team Lake Zone (2006). Nile Perch sub-sector study in Lake Zone.
- Torre, D.A. (1986). *Empowerment: structured conceptualization and instrument development*. Ithaca: Cornell University Press.
- Thorpe, A., and Bennett, E (2004). Market-Driven international fish supply chains: The case of Nile Perch from Africa's Lake Victoria. *International Food and Agribusiness Management Review*, Vol.7, issue 4.
- The LVFO Regional working group on frame surveys (2005). *Characteristics of the Lake Victoria fishery based on frame surveys conducted in 2000, 2002 and 2004: With recommendations for development and management of the fishery: A status report on frame surveys 2000 to 2004*.
- Tanzania government website- <http://www.tanzania.go.tz>
- Tanzania online – <http://www.tanzaniaonline.com>
- The National Coordinating Office, Fisheries Management (2007). *Post training evaluation report on BMU orientation training*. IFMP.
- United Republic of Tanzania (URT) (1996). *The National Poverty Eradication Strategy*. Vice president Office. Government Printer pp 58.
- United Republic of Tanzania (URT) (1997). *National Fisheries Policy and Strategy Statement*. Government Printers pp 24.
- United Republic of Tanzania (URT) (2003). *The Fisheries Act NO.22*. Government Printer pp 42.
- Worthington, E.B., and Worthington, S. (1933). *The Inland Waters of Africa: The Result of Two Expeditions to the Great Lakes and Uganda with Accounts of their*

- Biology, *Native Tribes and Development*. MacMillan and Co. Ltd., London. pp 259.
- Welcomme, R.L. (1968). Observations on the biology of introduced species of tilapia in Lake Victoria. *Revue Zoologique Botanique, Africa* 76, 249-279.
- Welcomme, R.L. (1988). International introductions of inland aquatic species. FAO Fisheries Technical Paper 249. FAO, Rome.
- Witte, F., Goldschmidt, T., Goundswaard, P.C., Ligtvoet W., Oijen, M.J.P. van and Wanink, J.H. (1992). Species extinction and concomitant ecological changes in Lake Victoria. *Netherlands Journal of Zoology* 42, 214-232.
- Wilson, D.C., Medard, M., Harris, C.K., and Willey, D.S., (1999). The implications for participatory fisheries management of intensified commercialization on Lake Victoria; *Rural sociology*. College station: Vol.64, iss.4; pg 554.
- Wilson J.D.K. (2004). Fiscal Arrangements in Tanzania Fisheries Sector: FAO Fisheries Circular No. 1000.
- World Bank – <http://web.worldbank.org>
- Yongo, E., Keizire, B.B., and Mbilinyi, H.G. (2005). Socio-economic impacts of fish trade: The state of the fisheries resources of Lake Victoria and their management, proceedings of the Regional stakeholders' conference 24<sup>th</sup>-25<sup>th</sup> February 2005.

## APPENDICES

### APPENDIX 1. SUMMARIES OF THE YEAR 2000, 2002, 2004 AND 2006 FRAME SURVEYS FOR LAKE VICTORIA

ITEM	REGIONS			
	KAGERA, MARA, MWANZA			
	2000	2002	2004	2006
	Survey	Survey	Survey	Survey
Number of Landing sites	598	594	575	634
<b>Landing sites facilities</b>				
Bandas	30	28	31	49
Cold rooms (working)	2	6	5	0
Cold rooms (not working)	0	27	36	6
Pantoon/Jetty	32	31	25	26
Fish stores	14	24	16	19
Portable water		1	30	49
Toilet facilities		20	74	69
All weather roods	137	189	176	171
Boat repair facilities	224	323	235	249
Net repair facilities	248	332	218	218
Electricity supply	20	35	25	31
<b>Fisheries staff</b>				
Fisheries staff resident		54	49	68
<b>Fishers</b>				
Number of fishermen	55,985	80,053	77,997	98,015
Foot fishers				780
<b>BMU presence</b>				
Number of landing sites with BMU's			466	
<b>Fishing crafts</b>				
Number of fishing crafts	15,434	21660	22,653	29,732
<b>Mode of propulsion</b>				
No. crafts using outboard engines	1,451	2,611	5,576	6,416

No. crafts using inboard engines	75	0	0	0
No. crafts using paddles	11,623	14,638	14,339	19,954
No. crafts using sails	2,326	3,909	2,718	3,448
<b>Craft types</b>				
Catamarans				317
Dugout canoe	694	373	294	268
Parachute	69	292	294	126
Sesse flat at one end	2,068	3,856	14,793	6,251
Sesse pointed at both ends	12,659	16,552	5,777	18,658
Rafts			1,201	4,216
<b>Transport crafts</b>				
No. of transport crafts	639	1,082	181	1,320
<b>Derelict crafts</b>				
No. of derelict crafts	2,812	3,458	5,882	5,540
Gears by types				
<b>GN by sizes</b>				
Gill nets: <= 2.5''	7,095	14,563	10,693	11,926
Gill nets: = 2.5''	3,123	4,614	7,736	6,666
Gill nets: <= 3''	2,936	6,159	6,323	10,549
3 1/2''	2,300	11,305	5,290	8,497
4''	4,074	29,475	10,184	23,708
4 1/2''	5,651	30,716	17,150	31,087
<b>Total number of GN &lt; 5''</b>	<b>25,179</b>	<b>96,832</b>	<b>57,376</b>	<b>92,433</b>
5''	82,290	184,943	272,224	207,386
5 1/2''	27,089	71,347	169,139	64,672
6''	59,326	57,274	64,514	31,392
6 1/2''	8804	7834	8571	6,829
7''	15123	6343	9009	9,300
7 1/2''	0	530	358	832
8''	1,139	21	1,128	1,422
8 1/2''	0	0	0	0

9''	198	269	909	377
10''	477	198	429	529
> 10''	0	270	42	0
<b>Total number of GN &gt; 5''</b>	<b>194,446</b>	<b>329,029</b>	<b>526,323</b>	<b>322,739</b>
Total gill nets	<b>219,625</b>	<b>425,861</b>	<b>583,699</b>	<b>415,172</b>
<b>Dagaa fishing gears</b>				
Lift nets Lampara	315	130	307	370
Number of Small seines mesh size <= 5 mm	3,251	3,874	1,135	856
Number of Small seines mesh size 6 - 9 mm	0	0	3,118	3,630
Number of Small seines mesh size 10 mm	22	969	121	357
Total Number of Small sines	3,273	4,843	4,374	6,204
<b>Long line hooks</b>				
Number of Long Line hooks size <4				17,626
Number of Long Line hooks size 4 - 7				106,502
Number of Long Line hooks size 8 – 10				1,732,298
Number of Long Line hooks size > 10				2,278,962
Total Number of Long Lines hooks	2,201,901	4,608,998	3,081,885	4,135,388
Number of hand lines	14,307	39,404	19,186	35,479
<b>Other gears</b>				
Cast nets	63	135	66	31
Beach seines	999	1,454	1,532	1,675
Scoop nets	809	812	536	994
Monofilament	0	0	5,041	
Basket/Traps	1,030	1,030	598	92
Other gears (Unspecified)	0	46	70	38

**Source: Fisheries Division: Lake Victoria Frame Survey Report 2006 Tanzania**

**APPENDIX 2. PRODUCTION OF FISH IN METRIC TONS FOR THE PERIOD OF 1990-2003 IN TANZANIAN WATER**

<b>Year</b>	<b>Marine Water</b>	<b>Major Lakes</b>	<b>Other Source (Minor Water Bodies)</b>	<b>Total Production</b>
1990	54106	315249	44685	<b>414040</b>
1991	50876	235852	40025	<b>326753</b>
1992	52750	239500	39335	<b>331585</b>
1993	33483	250200	61317	<b>345000</b>
1994	37463	196297	54789	<b>288549</b>
1995	38561	266869	54570	<b>360000</b>
1996	43443	222297	91077	<b>356817</b>
1997	45530	259000	52680	<b>357210</b>
1998	47959	290100	11700	<b>349759</b>
1999	48910	259000	4010	<b>311920</b>
2000	50260	277000	2590	<b>329850</b>
2001	49800	277060	3940	<b>330800</b>
2002	49600	273000	2300	<b>324900</b>
2003	49100	301855	95	<b>351050</b>

**Source: FAO FISHSTAT & FISHERIES DIVISION**

**APPENDIX 3: GUIDING QUESTIONS FOR FIELDWORK**

**FGD BMUs committee**

1. What is the current structure of BMU and how was reformed?
2. Does the BMU a true representative of fisher's community? Why?
3. Is the BMUs legally registered? How?
4. What is the overall objective of BMUs?
5. How many sub committees do you have?
6. What are the responsibilities of each sub-committee?
7. What are the strengths and weakness in conducting your responsibilities?
8. What should be done to improve the BMUs performance?



9. What the current fish selling system at the landing site?
10. Does this system influence the price given to fishers? How? (Transportation, handling facilities, marketing availability)
11. What are the responsibilities of each player involved in the selling system?
12. Is there any activities done by BMUs in relation to sales of fish? How/Why? (if No)
13. Is there any sub-committee of BMUs involved in Fish sales?
14. Did they get any training on Sales and financial Management?
15. What are the problems of current selling system? And what should be done by BMUs to improve that system?
16. What kind of the resources/assistance is needed by BMUs in order to undertake the activities of fish sales?
17. What is the dominant price of fish? Why fishers are the price taker?
18. Is there anything can be done by BMUs in relation to price negotiations with major fish buyers? How?
19. How does BMUs, coordinate, interact and network with other stakeholders?
- 20.

### **Focus Group Discussions: Fishers**

1. What do you know about BMUs?
2. What is the overall objective of BMUs?
3. What is the current structure of BMU and how was reformed?
4. Does the BMU a true representation of fisher's community? How?
5. What were your expectations during its formation?
6. What are the strengths and weakness of BMUs performance?
7. What should be done to improve the BMUs performance?
8. What the current fish selling system at the landing sites?
9. Does this system influence the price given to fishers? How? (Transportation, handling facilities, marketing availability)
10. What are the responsibilities of each player involved in the selling system?

11. Is there any activities done by BMUs in relation to sales of fish? How/Why? (if No)
12. Is there any sub-committee of BMUs involved in Fish sales?
13. What are the problems of current selling system? And what should be done to improve that system?
14. What is your opinion incase BMUs is empowered to implement first hand sales regulations?
15. What resources/assistance is needed by BMUs in order to undertake fish sales activities?
16. What is the dominant price of fish? Why fishers are the price taker?
17. What are the problems of the current selling system?
18. What is the fish dominant price? Who set the price and why?
19. What could be done by BMUs to improve the current selling system? How?
20. Is there anything can be done by BMUs in relation to price negotiations with major fish buyers? How?
21. How does BMUs, coordinate, interact and network with other stakeholders?

### **Focus Group Discussions: Traders**

1. What do you know about BMUs?
2. What is the overall objective of BMUs?
3. What is the current structure of BMU and how was reformed?
4. Does the BMU a true representation of fisher's community? How?
5. What were your expectations during its formation?
6. What are the strengths and weakness of BMUs performance?
7. What should be done to improve the BMUs performance?
8. What the current fish selling system at the landing sites?
9. What are the problems associated with current selling system
10. What is the fish dominant price? Who set the price and why?
11. What could be done by BMUs to improve the current selling system? And how?
12. Apart from buying and selling fish what other assistance or service do you offer to fishers? How?

13. What is your opinion incase BMUs is empowered to implement first hand sales regulations?
14. What resources/assistance is needed by BMUs in order to undertake fish sales activities?

**Key Informants Interview Guide:**

*I would like to know what the Government and major fish buyer's opinion on first hand sales and the need of BMUs to implement such first hand sales regulation*

1. What do you understand by BMUs?
2. Do you think BMUs is a true representative of fisher's community? Why?
3. What were your expectations during its formation?
4. Do you think BMUs will contribute towards sustainable fisheries in Lake Victoria? How/Why?
5. What are the strengths and weakness of BMUs performance?
6. Did you involved in BMUs reformation? (YES; what was your role?)
7. What the current fish selling system at the landing sites?
8. What are the problems/ weakness of that selling system?
9. Are there any existing fish selling regulations/rules at the landing sites? (YES; Mention/NO; Why?)
10. (If YES) Do you think these regulations/ rules support fishers in selling their fish? (YES; How/ No Why?)
11. What is your opinion on establishing the first hand sales regulations which will favour fishers?
12. Do you think BMUs could be a legitimacy fisher's organization to implement such regulations once established (YES/NO; How/Why?)
13. Do you think BMUs will be capable to implement such first hand sales regulations? (YES/NO; Why?)
14. What kind of resources do you think will be needed by BMUs to implement such regulations?