ANALYSIS OF THE IMPLEMENTATION AND ENFORCEMENT OF THE FISH ACT, CAP. 197 (2000) ON LAKE VICTORIA IN UGANDA

NADIOPE ERIC
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A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A DEGREE OF MASTER OF SCIENCE (ENVIRONMENT AND NATURAL RESOURCES MANAGEMENT) OF MAKERERE UNIVERSITY

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DECLARATION

I, Nadiope Eric hereby declare that the work presented in this report is original and has never been submitted in this or any other university or institution of higher learning unless otherwise stated.

Signed: ..…….…….

NADIOPE ERIC – CANDIDATE

Date: ……

This thesis has been submitted to Makerere University with my approval as a University supervisor.

DR. WILSON WAISWA MWANJA

Signed: ……..……

Date: ……..

DEDICATION

To God the almighty who has brought me this far. Secondly to members of my family: Mummy Bwanga Bweguyibwa Margaret, Wife Loyce, Sons: Aaron, Emmanuel, and Ephraim.

ACKNOWLEDGEMENT

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Dear parents, wife and relatives who have tolerated the inconveniences I have caused in one way or another contributed enormously to my academic success. Finally, I thank the lord God almighty the giver of all good things for bringing me this far. All praise and glory go to Him.

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LIST OF ACRONYMS

BMUs	Beach Management Units
FAO	Food and Agriculture Organization
LC	Local Council
LVFO	Lake Victoria Fishing Organization
MCS	Monitoring, Control and Surveillance
NaFIRRI	National Fisheries Resources Research Institute
SPSS	Statistical Package for Social Scientists
UNESCO	United Nations Educational, Scientific and Cultural Organization
UBOS	Uganda Bureau of Statistics
MCS	Monitoring, Control and Surveillance for fisheries
IFMP–LVFO	Implementation of a Fisheries Management Plan for Lake Victoria Fisheries Organization.

ABSTRACT

The study conducted from 1964 to 2008 examined the adequacy of the implementation and enforcement of Uganda's Fish Act, Cap. 197 of 2000 in controlling the exploitation and conservation of fisheries resources of Lake Victoria (Uganda). The study examined the impact of the implementation of the Fish Act and/the inadequacy of the Fish Act in conservation and ensuring effective exploitation of fisheries resources in Lake Victoria; the factors affecting implementation and enforcement of the Fish Act; the relationship between implementation and enforcement of the Fish Act; and the relationship between the implementation of the Fish Act and level of malpractices and resource destruction in Lake Victoria (Uganda). The primary data were collected using interview schedules, questionnaires and observation checklist while secondary data were obtained from relevant reports including frame surveys and reports from implementing agencies to assess the implementation and enforcement of the Fish Act. A cross-sectional survey design was conducted and a sample of 163 respondents were interviewed including the fisher folk, fisheries law enforcement personnel, fish processors and exporters, members of Beach Management Units (BMUs), LVFO officials and Commissioner for Fisheries. The secondary data was used in assessing the impact of enforcement regime on fisheries conservation and effective exploitation.

Results indicated that fisher folk and fisheries managers knew about the existence of the Fish Act (Cap.197 of 2000). Despite this, several practices that breached the Fish Act continued on Lake Victoria implying that implementation and enforcement of the Fish Act on Lake Victoria was inadequate to ensure sustainable exploitation and conservation of fisheries resources. The study showed high incidence of fishing illegalities on Lake Victoria which was probably due to both gaps in the Fish Act as well as failure to implement and enforce provisions of the Fish Act. There was a significant negative relationship between implementation and enforcement of the Fish Act ($r = 0.152$; $p < 0.05$). Implementation of the Fish Act was shown to have had a negative effect on exploitation and conservation of fisheries resources on Lake Victoria as fishers exploited the loopholes/gaps in the Fish Act. The study also found that a number of subsidiary legislations are not provided for in the existing principal Fisheries Act, and presented legal challenges at implementation.

In order to improve the effectiveness of implementation and enforcement of the Fish Act to control the exploitation and conservation of fisheries resources on Lake Victoria (Uganda), it's recommended that a review of the existing Fish Act be undertaken to plug the gaps exploited by unscrupulous fishermen and illicit traders. It is also recommended that legal provisions be made in the principle Act for key subsidiary legislations that are not catered for in the current Fish Act including the community involvement in enforcement provided in the BMU Instrument; instrument on prohibited fishing gears; closed fishing area rules instrument; and the instrument concerning protected fisheries areas. The revision of the existing Fish Act must provide for increase in the capacity of the Department of Fisheries Resources to enforce fisheries regulations, sensitizing of the fisher folk and utilizing BMUs in enforcement of the Fish Act.

CHAPTER ONE

INTRODUCTION

The global rise in demand for more food has led to a sharp increase in the exploitation of several biological resources threatening their continued existence raising increased global concern for protection of the containing ecosystems leading to concerted international efforts to manage such threats to global biodiversity through one of the most important international agreements, the Convention on Biological Diversity (CBD), prepared in Rio de Janeiro in 1992 (Ogutu – Ohwayo, 2003). In ratifying the CBD, Governments agreed to take actions to: conserve biological diversity; ensure sustainable use of its components; and ensure fair and equitable sharing of benefits from genetic resources. In this regard FAO (1995) has recognized the vulnerability of aquatic ecosystems and associated biological, and noted that the myth that fisheries were an unlimited gift of nature was fast fading with increased exploitation pressure to meet the explosion in demand for aquatic ecosystem products and increasing to meet the nutritional, economic and social wellbeing of the growing world's human population.

Efforts to manage, conserve, and enhance ecosystem productivity and production when at same time addressing the needs spelt out above naturally involves challenges of law enforcement (Kar et al., 2004). For fisheries these challenges include need for more revenue through taxation vis-a-vis management of fishing capacity; determination of license fees; imposition of rules regarding lease of property rights and use of seasonal harvesting among others (EAC, 2004) which make implementation of existing legislations ineffective particularly when coupled with gaps in the existing legislations.

1.1 Background to the study

Implementation of Uganda's Fish Act refers means extent to which fisher folk will follow the set of Rules contained in the Fish Act during fishing and in carrying out other fishing related activities covered under the Fish Act; whereas enforcement of the Fish Act for purposes of this study refers to the practice of compelling observance of the regulations embodied in the existing Fish Act. Implementation and enforcement of the Fish Act in Uganda are normally through controlling access (LVFO, 2005). Access to fisheries in Uganda has for a long time been controlled through licensing (Ministry of Natural Resources, 1995; Department of Fisheries Resources (DFR), 2008). However stocks of important commercial fish species are reported to have declined arising from uncontrolled access and the increased human population that exerted tremendous pressure on the resource (MAAIF, 2003). Other measures to regulate fishing activities include control of the type and mesh size of fishing gear used, control of the size of fish harvested and through closed seasons and fishing grounds and through limiting the type and size of fishing crafts.

In addition to these control measures, operations by DFR law enforcement personnel to confiscate illegal gears have been conducted on all Ugandan water bodies particularly Lake Victoria. For example, in the period between June 2004 to July 2008, LVFO regional MCS data revealed that 2915 days of patrol were conducted on Lake Victoria by DFR Law enforcement personnel, police and informers. During this period, 4565 beach seines, 5863 monofilament nets and 50,599 undersized gill nets were confiscated (DFR Reports, 2009). Other efforts towards compliance with the Fish Act include border operations to intercept containers of illegal gears, operations in fish markets and impromptu road blocks targeting dealers in undersized fish, and

intelligence based land and water operations targeting hot spots for the capture and processing of undersized fish. Despite these efforts, however, many of Uganda's fisheries were reported to be in a poor condition related to overexploitation and environmental degradation (MAAIF National Report of the Frame Survey, 2006).

Under objectives of the Constitution of the Republic of Uganda, the state is obliged to protect important natural resources including water, wetlands, fauna and flora on behalf of the people (Constitution of the Republic of Uganda, 1995). The Fish Act, Chapter 197 (2000) is the legal instrument that gives effect to enforcement of the Fisheries Law in Uganda. Prior to independence, this Law was introduced as an ordinance by the colonial Government in 1958 (LVFO, 1999). After independence this ordinance and other Statutory Instruments related to it were ratified and became an Act of Parliament, the Fish Act (1964) (Order in Council, 1962).

The objective of the Fish Act is sustainable exploitation and conservation of fisheries resources through provision of sustainable management strategies, utilization and development of the fisheries production potential; to provide for the conservation, capture, processing and marketing of fish, the licensing and registration of fishing vessels and fishers; to provide for aquaculture; the methods of fishing and fishing gear; and establishment of administrative structures for fisheries management including management for fish quality, processing, trade and marketing (Fish Act, Cap. 197 2000). The Fish Act was reviewed in 1967 when the constitution was changed, and in 2000 when all Acts of parliament were revised to bring them in line with the new Constitutions of 1967 and of 2000. However, some sections in the Fish Act especially those relating to penalties like section 33 (the general penalty) and section 34 (reward to informers) have not been changed since 1964. Over the years, Statutory Instruments have been enacted to

strengthen the Act but a number of these instruments were not done within the existing provisions of the Act (LVFO, 2007).

Among other challenges that DFR management has been grappling with is the explosion of the Nile Perch in 1980s following its introduction decades earlier. This explosion led to a boom in Nile perch export market, leading to an influx of people who were not traditionally fishermen to cash in on the "lucrative" industry (Othina, 1999). The resulting competition pushed fishermen to resort to the use of destructive fishing methods to sustain their levels of livelihood and food requirements. The use of poison, which led to a ban on fishing and the export of fish in March 1999 (Ntiba *et al*, 2001), was probably largely due to these rent – seekers.

Another challenge in fisheries management cited is the remoteness of some of the landing sites and the inadequate transportation infrastructure that were found to impose severe constraints on the implementation and enforcement of the fishing legislation on Lake Victoria (Bwathondi *et al*., 2001). In addition, handling facilities, ice plants, storage facilities, sanitary conditions (including boats with containers) were found to be either lacking or inadequate at landing sites, contributing to poor fish quality while also making it impossible for fisheries managers to enforce the provisions of the Fish Act and related subsidiary statutory instruments that were premised on availability of such infrastructure.

It was also found that as traditional fishing methods landed increasingly less catch, fishermen increasingly resorted to deploying illegal fishing gear such as cast nets, and use of poison to improve their catches (Ntiba et al., 2001). A study that interviewed 1066 fishers in all three Countries of Lake Victoria, found that 33% of respondents linked declines in the stock to the contravention of fishing regulations, 32% felt this was due to excessive fishing effort and 11% to

pollution or the presence of water hyacinth (SEDAWOG, 2000). In most cases, these reasons used to explain catch declines indicate a widespread acknowledgement amongst the Lake's fishing communities that effort levels were excessive, that damaging fishing techniques were in use and that regulations especially the Fish Act were generally ignored (SEDAWOG, 2000).

In addition to issues fishing related challenges the Lake Victoria region has been negatively affected by destructive environmental factors including deforestation, poor land use, unplanned settlements, urban sewage and fishing village sanitation, ineffective regulation of basin industries leading to localized eutrophication, algae blooms, and water hyacinth infestation as a result of nutrient loading (Nyeko *et al.,* 2005) that are not covered by fisheries legislations. These environmental stressors work to the detriment of ecosystem functions that support fisheries production. Consequently, management of the fisheries resource of Lake Victoria has posed a challenge mainly because management of the fisheries is by national Governments under separate national jurisdiction (Ogutu – Ohwayo & Kirema – Mukasa, 2006). Against this background, this study attempted to examine whether the Fish Act Cap. 197 (2000) provides for effective regulation and enforcement in the Ugandan part of Lake Victoria and whether its implementation has been impeded by other factors.

1.2 Statement of the Problem

There is a sharp decline in fish stocks and catch per unit effort in the Uganda's part of Lake Victoria fishery like with other fisheries in the country. As a result, fishermen have resorted to use of illegal fishing gears and methods such as beach seines, cast nets, fish poison and weirs to improve their catches. This among stakeholders is thought to be coupled with failure to

implement the Fish Act and the inadequacy of the Law in itself allowing for fishermen to take on destructive illegal gears in their quest to maximize the returns from fishing. This has put at risk the fisheries industry and livelihoods over three million of people dependant on it.

1.3 Objectives of the Study

1.3.1 Main Objective

The study assessed the adequacy of implementation and enforcement of the Fish Act, Cap.197 (2000) in controlling the exploitation and conservation of fisheries resources on Lake Victoria, (Uganda).

1.3.2 Specific objectives

1. To examine the failure to implement the Fish Act and the inadequacy of the Fish Act on Lake Victoria fisheries resources.
2. To examine the factors affecting implementation and enforcement of the Fish Act on Lake Victoria (Uganda).
3. To establish the relationship between implementation and enforcement of the Fish Act.
4. To investigate the relationship between the implementation of the Fish Act and level of malpractices and resource destruction in Lake Victoria (Uganda).

1.4 Research questions

The central research question of the study was “Is the failure to implement or gaps in the Law responsible for the destruction of the fisheries resources. This question is expanded and leads to the following key questions:

1. What are the factors affecting implementation and enforcement of the Fish Act in Uganda?

2. What are the causes for increased illegal fishing on Lake Victoria in Uganda?
3. Is the increase in illegal fishing due to gaps and missing provisions in the Fish Act or failure to implement provisions of the Fish Act?
4. Is the increase in fishing effort and destruction of critical fish habitats/areas such as the breeding and nursery grounds due to lack of appropriate provisions in the Fish Act?

1.5 Scope

The study was carried out on Ugandan part of Lake Victoria in the Districts of Mukono, Wakiso, Kampala and Jinja. It examined the impact of the failure to implement the Fish Act and/or inadequacy of the Fish Act on Lake Victoria fisheries resources; the factors affecting implementation and enforcement of the Fish Act; the relationship between implementation and enforcement of the Fish Act and the relationship between the implementation of the Fish Act and level of malpractices and resource destruction in Lake Victoria (Uganda).

This study covered the period since 1964 to 2008 with emphasis on the recent events in fisheries management including those of 2004 when the current Fisheries policy was formulated and promulgated. The study focused on the views of the current resource users and managers; and the secondary data on the status of the fisheries resource and fishing activity on Ugandan part of Lake Victoria.

1.6 Significance of the study

The Fish Act Cap. 197 (2000) has overtime become inadequate to ensure effective fisheries management resulting in increased fishing malpractices. This inadequacy threatens the fisheries industry and livelihoods of millions of people dependant on it. Consequently, this study has highlighted the challenges faced in implementation and enforcement of the Fish Act as well as

the effect of the Fish Act on exploitation and conservation of fisheries resources on Lake Victoria. The results of the study are expected to fill an information gap currently existing on factors affecting implementation and enforcement of the Fish Act on Lake Victoria, and could be of use to NGOs involved in conservation of fisheries resources in Uganda.

The results of this study will be useful to the Ministry of Agriculture, Animal Industry and Fisheries in formulating strategies for improving the Law and its implementation.

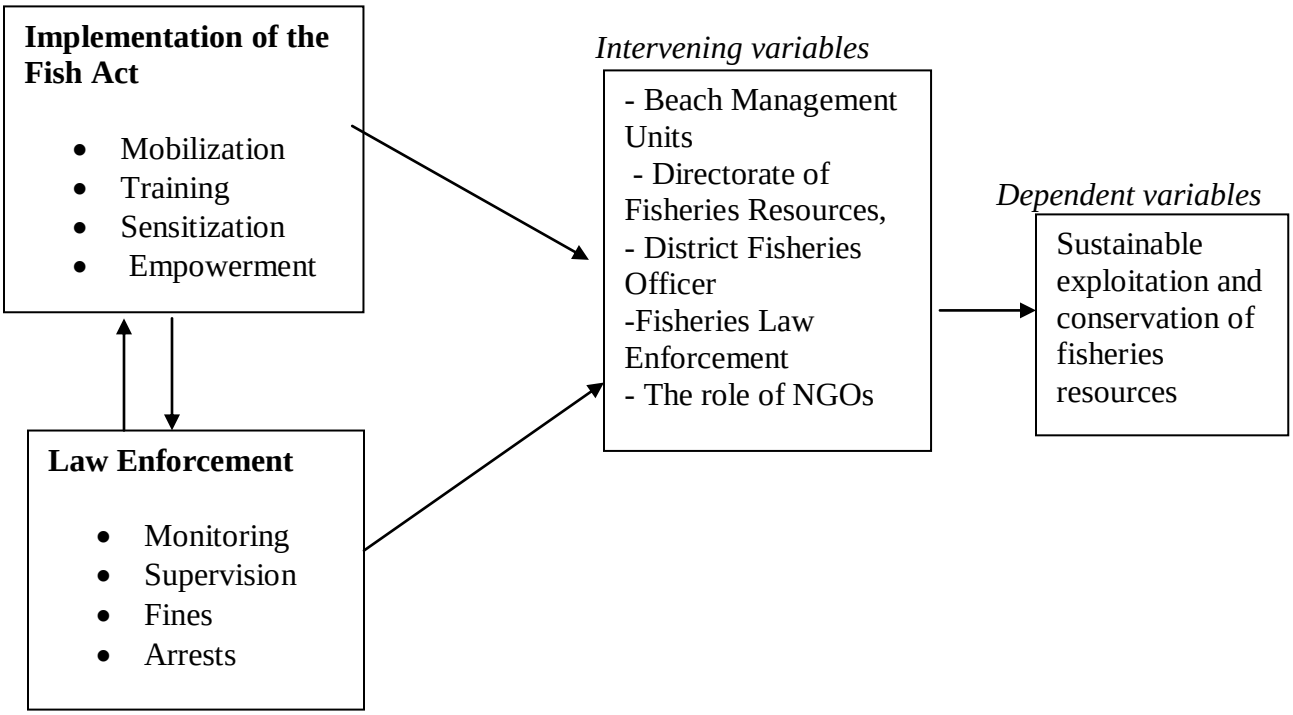
The outcome of this study will further guide on the needed actions in controlling illegal fishing including providing suggestions in improving the relationship between implementation and enforcement of the Fisheries law.

From the theoretical angle, the study will serve researchers as a basis for further studies in fisheries Law enforcement.

1.7 Conceptual framework

The relationship between the two input components of the Fish Act (implementation and enforcement) and the output (sustainable exploitation and conservation of fisheries resources is illustrated in Figure 1.1.

Independent variables



Source: Generated by the Researcher

Figure 1.1. Conceptual framework for implementation and enforcement of the Fish Act

The conceptual framework (Figure 1) considers implementation and enforcement of the Fish Act as independent variables while sustainable exploitation and conservation of fisheries resources was the dependent variables in the study. Implementation of the Fish Act includes and depends on mobilization, training, sensitization and empowerment of the fisheries managers and fisher folk communities so as to follow or obey the provisions of the Fish Act. In addition,

implementation of the Fish Act depends on and includes setting up of the fisheries management system like the Department of Fisheries Resources, Local Government/Regional Services centre and co-management structure which brings the fisher folk directly in management of the fisheries resource. It also incorporates training systems and institutions; issuing and gazetting of regulations and enforcement measures. Consequently, these regulations are enforced using the established structures. Law enforcement involves arresting, prosecuting, searching, seizure as well as monitoring levels of compliance (Okwach et al, 2005). The operation is finalized by seizure and destruction of illegal gears/items, undersize fish, among others. However, for implementation and enforcement of the Fish Act to lead to sustainable exploitation and conservation of fisheries resources, intervening factors like existing co-management structures (Beach Management Unit Committees in case of Uganda), fisheries Law enforcement personnel, Department of Fisheries Resources and NGOs play a big role. The combined interaction of all these factors is expected to lead to sustainable exploitation and conservation of fisheries resources.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Uganda's total surface area of 241,038 km^2 includes 42,383Km^2 (18%) of water surface in the form of Lakes and rivers, dams and swamps (Hecky & Bugenyi, 1992). The main fisheries include those of Lakes Victoria, Albert, Kyoga, Edward, and George, and the relatively smaller but significant socioeconomically include fisheries of the Kazinga Channel. Victoria Nile, Albert Nile, Lake Wamala, Nabugabo complex, Kooki lakes complex, and those of Kyoga satellite lakes complex; Uganda also has close to over 165 minor Lakes found majorly in western Uganda but not productive in fisheries (Mwanja *et al.*, 2003). Other water systems that play or have the potential to contribute to fisheries production include numerous river systems, communal or public water reservoirs, and swamps. Other sources of fisheries include floodplains rising out of seasonal and permanent wetlands (Ministry of Natural Resources, 1995). Lake Victoria is the second biggest Lake in the World with a surface area of 69,000 km^2. The Lake is shared between three countries, Tanzania constituting 49% of the area of the Lake, Uganda 45% and Kenya 6% (Crispin & Ikiara, 2000). The commercialization of Lake Victoria fishery has been increasing since late 1970,s and this has had increasingly significant contribution to the economies of the 3 East African Community countries that share Lakes Victoria including increase foreign exchange earnings, income earnings to the owners of fish processing and animal feeds manufacturing factories, tax income to the government, fisher incomes, and creation of employment opportunities.

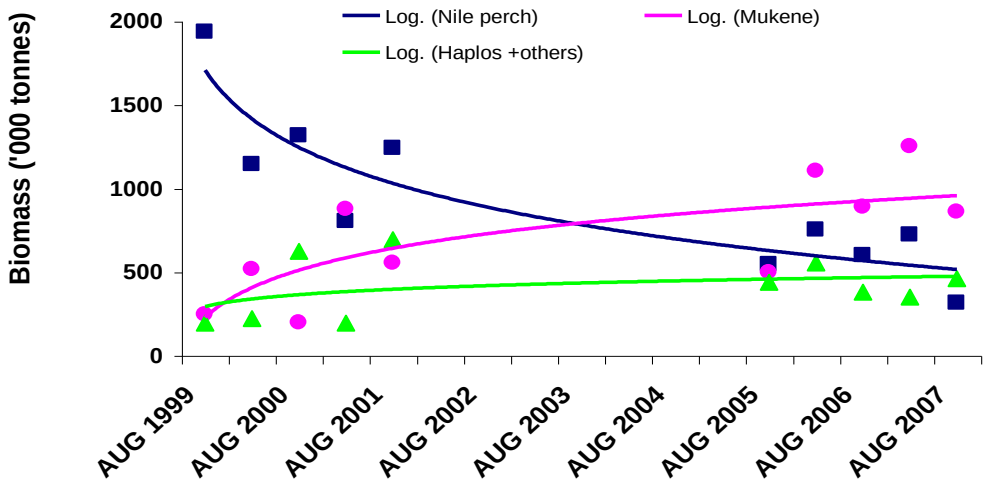
According to statistical abstract (2009) and NEMA (2006), fisheries resources contribute about 2.2% of Uganda's GDP; and over 12% of the agricultural GDP (UBOS 2009). Ugandans are estimated to harvest about 430,000 tons of fish each year (DFR, 2004). The largest component of the catch being of Nile perch and Nile tilapia which come from Lakes Victoria and Kyoga. . In a bid to manage the Lake Victoria fisheries sustainably the countries that share the Lake joined with the international community in efforts to manage and preserve its water resources, fisheries, and environment under Lake Victoria Fisheries Organization (LVFO, 1994).

In here review is made about the implementation and enforcement of the Fish Act (1964) Cap.197 (2000) and its contribution to exploitation and conservation of fisheries resources in Uganda since 1964 when it was adopted into an Act of Parliament by an order in council that created, for the first time, the Department of Fisheries. The review is presented according to the themes of the study; fish production, fishing malpractices, the international instruments used on fisheries resource, domestic legislation, management approaches, fisheries Law enforcement and, challenges of implementing the Fish Act to Conserve Fisheries Resources on Lake Victoria. The chapter concludes with identification of research gaps filled by the study.

2.2 Fish Production

A report by LVFO (2007) estimated the total biomass of fish from Lake Victoria was two million tons in 2005 and has remained about that level since the 1999 when it was first estimated to be 2.2 million tons (LVFO, 2005). However, the relative species' contribution to the fishery changed substantially, with Nile perch decreasing from 59% in 1999/2001 to 37% in 2005/06, *Rastrineobola argentea* (Dagaa) increasing from 22% to 38%, while other species rose from 15% to 24% (LVFO, 2007). A notable feature was the continuing increase in haplochromine

numbers considering that this group of fishes was thought to have been nearly exterminated by Nile perch (Abila, 2002). Individual fish biomass trends on Lake Victoria from Hydro-acoustic survey data from August 1999 to August 2007 by NaFIRRI are shown in Figure 2.1.



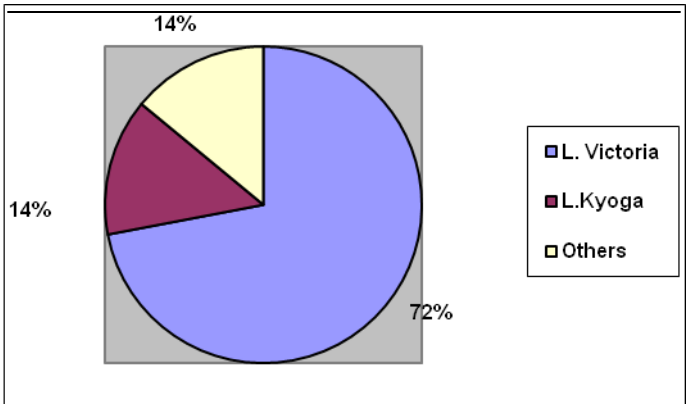
Source: NaFIRRI (2007)

Figure 2.1 Fish biomass trends on Lake Victoria

The surveys show that Nile perch had the highest fish biomass in Lake Victoria in the years 1999 to 2003 although it was on a declining trend (Figure 2.1). The decline in Nile perch biomass continued through 2004 to 2007 when it was estimated at 500,000 tones. The same data shows that haplochromine biomass estimated at 300,000 tons in 1999 steadily increased to approximately 850,000 tons in August 2007.

Majority of the fish catch was from Lake Victoria and Lake Kyoga (UBOS, 2004). By far, the most important water body in the country is Lake Victoria whose share of total catch was 61.3% in 2002 and 72.4% in 2003 compared to 42% in 1961 and 49% in 1992 (MAAIF, 2006). Lake Kyoga followed with a share of 25% and 13.6% in 2002 and 2003, respectively (MAAIF, 2006). Fish harvests from the other Lakes and the River Nile (at 14%) are indicated in *Figure* 2.2

(UBOS, 2001) and Table 2. 1 (MAAIF, 2003). Comparing it to 1961 when Lake Victoria and Lake Kyoga contributed about 53%, the fish catch has increased to over 87% of the national catch, presumably due to increased availability of Nile Perch (MAAIF, 2006).



Source: UBOS, 2004

Figure 2.2 Proportion of fish catch by water body, 2003

Comparing the above information with trend data provided by MAAF (2003) in Table 2.1, Lake Victoria had the highest tonnage of fish catch from 1999 to 2003. Like UBOS (2004), Lake Kyoga provided the second highest tonnage of fish catch over the same period making Lakes Kyoga and Victoria the biggest contributors to fish production in Uganda.

Table 2.1: Fish catch by water body (thousand tones), 1999-2003

Lakes	**1999**	**2000**	**2001**	**2002**	**2003**
Lake Victoria	104.2	133.4	131.8	136.1	175.3
Lake Albert	29.1	19.4	19.6	19.4	19.5
Albert Nile	3.7	n.a	n.a	n.a	n.a
Lake Kyoga	81.1	55.9	58.4	55.6	32.9
Lake Edward	7.4	5.2	6.4	5.2	5.9
Lakes Edward, Kyoga and Kazinga Channel	4.3	5.6	4.5	5.6	8.3
Total	**230**	**220**	**221**	**222**	**242**

Source: MAAIF (2003)

According to NaFIRRI (2006), there are several fish harvesting methods (Table 2.2). Some methods depending on specifications are recommended while others are prohibited and therefore illegal. Gill-nets and boat seines are the common fishing gears used on the Lakes (LVFO, 2005), however, they are improperly used as active gears drugged through breeding grounds while taking along all fish from the breeders to the juveniles (Abila 2002). Coupled with this, fishermen hit the water using a club locally called "tycoon" to drive the fish into these nets (Nabongo, 2007). Among key impacts of seining is that tilapia species that are mouth-brooders hold their fertilized eggs and keep their young ones in the mouth to protect them from predators, but are forced to spit them prematurely thereby disrupting the brooding process and detrimentally affecting the recruitment of tilapia fishes.

Table 2.2: Lake-wide summary of fishing capacity/effort 2000 – 2006

Variable	**2000**	**2006**	**%Change**
No. Landing Sites	1, 492	1,431	-4
No. Fishers	129,305	196,426	52
No. Fishing crafts	42,493	69,160	63
Boats using Outboard motors	4,108	12,765	211
Boats Sails	6,3043	10,310	64
Boats Paddles	2,032	45,753	43
Gillnets <5 inch (ILLEGAL)	113,177	215,049	90
Gillnets >5 inch	537,475	1007,258	87
Hand line hooks	53,205	71,636	35
Long line hooks	3,496,247	9,044,550	159
Dagaa small seines	n.d.	9,631	24
Beach seines (ILLEGAL)	7,613	3,653	52
Cast nets (ILLEGAL)	5,887	775	66
Monofilament nets (ILLEGAL)	0	2,293	100

Source: NaFIRRI (2006)

In Table 2.2, NaFIRRI (2006) provides a summary of fishing capacity/effort in Uganda Lakes in the years 2000 to 2006. The number of landing sites reduced from 1,492 to 1,431 while the number of fishermen increased by 52%. A frame survey by MAAIF (2006) also indicated that the landing sites on Lake Victoria (Uganda) decreased from 597 in 2000 to under 550 between 2002 and 2004 and to 481 in 2006 while the number of fishing crafts increased by 69,160 (63%) and monofilament nets increased by 2,293 (100%).

2.2.1 Illegal fishing Practices

Table 2.3: Amount and trend of illegal gears in Lake Victoria

	2000	2002	2004	2006
Gillnets less than 5" mesh size	113,177	178,205	142,618	215,049
Beach/boat seines	7,613	3,491	3,355	3,653
Cast nets	5,887	1,095	803	775
Monofilament gillnets	-	-	5,944	2,293

Source: DFR Frame survey, August 2006

Table 2.3 indicates that the number of gillnets less than 5" mesh size has continued to increase from 113,177 in 2000 to 215, 049 (48%) in the 2006. Likewise, the survey noted a growing use of monofilament nets and beach seines on Lake Victoria, with a slight decrease in cast nets. Okwach *et al* (2005) points out that undersized gill-nets and boat seines are also on the increase and are considered as illegal and destructive methods; that instead of the 5-inch gill net that is recommended to catch Nile perch in Lake Victoria, the fishermen use 3.5-inch or 2.5-inch mesh nets. Boat seining was reported to be in wide used on Lakes Victoria and Kyoga (MAAIF, 2003).

The number of fishing boats on Lake Victoria (Uganda) was found to have increased by 63%; while the number of fishermen increased by 52%; and the total number of gillnets by 88% with a 90% increase in gillnets with mesh sizes below the legal limit over the period 2000 to 2006 (LVFO, 2007). The number of long line hooks increased by 159% raising concern because this gear targets large Nile perch.

Basket fishing is another illegal method (MAAIF, 2004). Basket fishing involves the use of larger wicker baskets, which are placed in suitable locations especially along rivers. This method is harmful because it targets the fish moving upstream to breed. On the other hand, isolated cases of the use of poisons in fishing had been reported in Lake Victoria parts of Jinja, Mukono and Nakasongola Districts. Poisons are illegal and their use is not only detrimental to fish but to humans as well as other marine creatures (MAAIF, 2006).

In a study about implications of fishing gears and methods to the fisheries resource, Nabongo (2007) found that various fishing methods impact negatively on the fishery and the environment at large. These include use of poison and explosives, barriers, pots and baskets, spears, dredges, traps, lampara nets, scoop nets, seine nets, trawl nets, trammel nets/ tangle net system, drifting or set gillnets of more than 30 inches, cast net and monofilament nets among others. In the same study, it was revealed that the impact of bad fishing methods on the fishery includes:

a) Low degree of size selectivity,
b) Seine nets in particular indiscriminately capture fish of all sizes and age groups e.g. juvenile Nile perch – a target fish species or Tilapia species- by catch, which result into massive over fishing of the fish stocks.
c) The dragging of trawl nets on the lake bottom especially near the lake margins where most fish breed, disrupts courtship on breeding grounds of fish,

d) Trammel nets also catch smaller fish than would normally be retained due to blockage of the meshes by larger fishes,

e) The dragging of trawl seine and cast nets destroys benthos organism, habitats which ultimately affect important food for fishes,

f) Cast netting inshore destroys fresh water communities benthos organisms and breeding, spawning and nursery grounds of fish; disturbs ecosystem thus occasionally causing mouth breeders to spit the brood,

g) Monofilament nets result into "ghost fishing"[1] in the fishery.

Most fishermen are aware of the dangers of using destructive fishing gears and methods (LVFO, 2000). However, there are fishermen who are still stuck to the use of illegal methods (MAAIF, 2006). This study sought to investigate the persistence of these illegal practices when implementation and enforcement of the Fish Act are effectively done. The study also considered if involving the fisher folk in fisheries management was a positive undertaking.

2.3 The International Instruments for Fisheries Resource Management

According to MAAF (2004), Uganda has a number of obligations under International Law that are relevant to the fisheries sector and its ultimate development. Some of these have been ratified by Uganda and/or Uganda is a signatory (DFR, 2004). These include:

2.3.1 The Convention on Biological Diversity (CBD)

As a party to the Convention on Biological Diversity, Uganda is required to develop national strategies, plans or programs for the conservation and the sustainable use of biological diversity including fisheries resources. In response to this obligation, Uganda has the Fish Act, National

[1] Ghost fishing is the indiscriminate catching of fish by gill nets that got lost from the fisher and has been moved by strong winds from its location without anybody to remove the catch. It contributes to reduction in fish stocks.

Fisheries Policy and other programs aimed at the conservation of the aquatic resources. The current policy on fisheries was adapted in 2004 (MAAIF, 2004).

2.3.2 The Treaty for the Establishment of the East African Community

This treaty was signed on November 30th 1999 by the Heads of state of the participating governments (EAC Instrument 1999). The community brings together the partner states of Kenya, Uganda and Tanzania and was opened to Rwanda and Burundi in 2007 (EAC Instrument 2007). Uganda and other state parties to this community agreed to take concerted measures to foster co-operation in the joint and efficient management and the sustainable utilization of natural resources within the community for mutual benefit of the partner states (EAC, 2000 & 2008). The partner states agreed to adopt common regulations for the protection of shared aquatic and terrestrial resources by adopting common policies and regulations for the conservation, management and development of fisheries resources inter alia (EAC, 2004 & 2008).

2.3.3 The Ramseur Convention (1971)

The Convention on wetlands, signed in Ramseur, Iran in 1971 is an intergovernmental treaty providing framework for the national action and international co- operation for the conservation and wise utilization of wetlands and their resources. Uganda is a signatory to this convention and the conservation on wetlands with its habitat is necessary for the fisheries sector. The Convention is in line with the Fish Act (1964, 2000) as well as the National Fisheries Policy of Uganda (DFR, 2004).

2.3.4 The Convention on International Trade in Endangered Species (CITES)

The Convention on international trade in endangered species of wild fauna and flora was entered into by states to regulate the international wildlife trade in endangered species that had caused massive declines in the numbers of many species and degraded the ecological biodiversity. It came into force on 1st July 1975 with the current membership of 146 countries. Uganda ratified it on the 18th July 1991 and it came into force on the 16th October 1991. The treaty gives support to the Fish Act (1964, 2000) as it contains a number of clauses relevant to conservation and trade in endangered fishes.

2.3.5 Technical Co-operation for the Promotion of the Development and Environmental Protection of the Nile Basin (TECCONILE) 1992

TECCONILE was established by the Countries in the Nile basin (TECCONILE, 1992). It represents ten countries namely; Burundi, Egypt, Ethiopia, Eritrea, Kenya, Rwanda, Sudan, Tanzania, Uganda and Zaire. The purpose of the agreement is to provide for co-operation by the signatory countries on integrated and sustainable development, conservation and in joint use of region's water resources. Uganda uses and relies on Lakes Victoria, Kyoga and Albert which are all part of the Nile for the fishing industry.

2.3.6 Convention for the establishment of the Lake Victoria Fisheries Organization (1994)

In 1994 a Convention for the establishment of the Lake Victoria Fisheries Organization (LVFO) was signed by the three countries (LVFO, 1994). LVFO is an institution of the EAC that is specifically responsible for promoting proper management and optimum utilization of the fishery resources of Lake Victoria.

The main objectives of LVFO are to:

1. Foster co-operation amongst the contracting parties in matters regarding Lake Victoria.
2. Harmonize national measures for the sustainable utilization of the living resources of the Lake.
3. Develop and adopt conservation and management measures to assure the health of the Lake's ecosystem.

2.4 Domestic Legislation

A number of legislations have been enacted by the Parliament of Uganda in regard to management of natural resources. These include the Supreme Law (1995 Constitution), Principle Law (Acts) and subsidiary legislations. These put emphasis on the conservation, protection and preservation of natural resources (LVFO, 2005).

2.4.1 The 1995 Constitution of the Republic of Uganda

The national objectives and directive principles of state policy includes protection of the environment. "The state shall promote sustainable development and public awareness of the need to manage land, air and water resources in a balanced and sustainable manner for the present and future generations". Therefore there is need for the utilization of the natural resources of Uganda in such away as to meet the development and environmental needs of present and future generations of Ugandans. In particular, the state shall take all possible measures to prevent or minimize damage and destruction to land, air and water resources resulting from pollution or other causes. This implies that the Constitution of Uganda supports the Fish Act that seeks to boost fish production. The protection and preservation of the environment from abuse, pollution and degradation and to manage the environment for sustainable development and environmental awareness is provided. All Laws, Acts and decisions must not violate it (The Republic of Uganda Constitution, 1995).

2.4.2 The National Environmental Act, Cap. 153

The National Environment Act provides for sustainable management of the environment, establishment of an authority for coordinating, monitoring and supervising environmental matters (National Environmental Statute, 1995). The Act particularly lays down principles of environment management and above all the use and conservation of environment and natural resources of Uganda equitably and for the benefit of both present and future generations.

The Act further provides for limits on the use of lakes and rivers and the management of river banks and Lake Shores. The National Environment Act therefore complements the Fish Act in regulating water resource utilization including fishing. Prohibited are to drain any Lake or river or block any river from its normal course, deposit any substance in Lake or river or on or under its bed, excavate, drill tunnel or disturb the bed otherwise and the protection of the banks of rivers and shores of Lakes in Uganda from human activities that will adversely affect the rivers and the Lakes.

2.4.3 The Fish Act, Cap. 197 (2000)

The Fish Act makes legal provision for the control of fishing, the conservation of fish, the purchase, sale, marketing and processing of fish and any other matters connected therewith.

The Fish Act further provides that any person who uses any vessel in any waters of Uganda unless with valid fishing license to fish either with long lines or with nets or any other methods or fishes from any such licensed vessel but using any unauthorized method declared so by the Chief Fisheries Officer commits an offence. Therefore, if a vessel is licensed, the owner shall before using it or causing it to be used to fish, cause the registration letters and serial numbers assigned to him or her to be painted on the vessel in the prescribed manner (Fishing rules

Statutory Instrument 197-1 of the Fish Act).

The Fish Act clearly regulates the capture of immature fish in any waters in Uganda. If any person in any waters of Uganda captures, kills or injures any fish which is immature or buys, sells, exposes for sale or is in possession of any fish or part of a fish, which is immature and such immature fish was taken from any waters in Uganda except if it happens accidentally; commits an offence. There are some prohibited nets or methods of fishing. Therefore, if such an offence is committed or any other offence provided under the Act is committed, the fisheries officer has powers of a public prosecutor subject to the express provisions of the Director of public prosecutions.

Under the Fish Act, there are authorized officers who have the powers to weigh, measure and check any captured fish or any dried fish product, seize and destroy any vessel, the interior overall length is no greater than twenty eight feet, net, long line, basket, trap or appliance found on the shore beside or in the water in contravention of the Act. Any method whether beach seine or not are controlled by the authorized officers in respect of above.

2.5 Management approaches

Management approaches are systems that facilitate fisheries planning and organization for sustainable exploitation and conservation of fisheries resources. Co-management is one of the management approaches adopted by DFR to ensure sustainable exploitation and conservation of fisheries resources (The Fish (Beach Management Unit) Rules 2003, No 35). Co-management is defined as a partnership arrangement in which Government, the community exploiting the fisheries resource directly, resource stakeholders and external change agents (CSls) share the

responsibility/ authority for management of the fisheries resources. (Oguttu, Orwa and Albert, 2005). Co–management covers various partnerships and degrees of power sharing and integration of local and centralized government management systems (MAAIF, 2006). Through the decentralization policy, Government transferred fisheries extension and service delivery to Local Governments. Government has also, in its bid to share power with local authorities together with the communities, formulated and passed the law; The Fish Beach Management Rules 2003 under Statutory Instruments 2003 No. 35). However, regulation and enforcement of natural resource conservation remains a central government function.

To improve, the management of Lake Fisheries further, some Districts have finalized the formation of Beach Management Units (BMUs) at various landing sites (DFR, 2006). These BMUs are made up of members from the community sharing responsibilities with government fisheries institutions to improve management and regulation of fishing activities on landing sites.

According to the new BMU Uganda Statutory Instrument, a Beach Management Unit is an organization of fishers (boat crew or fishing laborers), Boat /Gear owners, Managers, caterers, Artisanal fish processors, fish mongers, boat builders, local gear makers, or repairers and fishing equipment sellers. BMUs too are CBOs (Community Based Organizations). Before the introduction of the Beach Management Units (BMU), the fishing communities were mainly organized informally under a head fisherman known as `Gabunga', chosen by general consensus of the community, through a vote or by virtue of being a landowner or long stay in the area. As time passed, another development was introduced in which the fishermen had Landing site Management Committees. These were formal administrations initiated by the Uganda Fisheries and Fish Conservation Association (UFFCA). The Fish Beach Management Rules 2003 have enabled the

formation of Beach management Units (BMUs). BMUs are a group of stakeholders whose livelihood is dependant directly or indirectly on the fishery resources and whose main function is management, conservation and protection of fish in their locality in collaboration with the government (Imende, Hoza and Bakunda, 2005). In Uganda, BMUs are also regarded as farmer groups through which new Government implemented programs and the National Agricultural Advisory Services (NAADS) addressing capture fisheries management issues can be extended. BMUs help to enforce the Fish Act regulations by their ability to set management rules locally and at lake wide level through by-laws and ordinances.

2.6 Implementation of the Fish Act

As part of the efforts to implement the Fish Act, the Department of Fisheries Resources adopted a number of measures for management of the fisheries resources of Lake Victoria including: licensing; limiting the size of fish (Nile perch and Nile tilapia) harvested; limiting the minimum mesh size of gill net to be used on the lake; prohibiting a number of fishing gears and methods and touched in fishing power especially in relation to cross-border fishing and fish trade, closed seasons and closed area restrictions. These are briefly reviewed in the following sections:

2.6.1 Licensing

Licensing is the main tool for control of access to the fisheries of Lake Victoria (MAAIF, 2004). The East African Community States agreed that nationals from neighboring states would be allowed to fish in the waters of another country as long as they comply with applicable laws and regulations of the country (LVFO, 2000). Fishers from other East African States are however treated as foreigners and the conditions for licensing foreigners are very prohibitive (Heck *et al,* 2004).

The 2001 Fishing (Amendment) Rules, No. 73 caused a problem of over licensing and too many boats and fishers were licensed by Local governments because there was no regard to provisions that prohibit licensing of the under sized boats (less than 28 feet) and licensing of excessive fishing effort without regard to the available fisheries resources when licensing was delegated to local authorities. Most local authorities used the licensing for revenue tendering out the licensing exercise while others passed on the exercise to other agencies because it was too costly and the Department of Fisheries Resources had not given corresponding funds and guidelines for the delegated function. In 2008, however, licensing of fishermen was recalled to the responsible government department due to failure of Local Governments to manage the fishing capacity/effort brought about by over licensing (DFR, 2008).

2.6.2 Limiting the size of fish harvested.

The size of Nile perch to be harvested has been set within a slot size of 50 cm to 85 cm and the minimum size of Nile tilapia to be harvested as been set at 25 cm (LVFO, 2005). The Fish (Immature Fish) Instrument, 2002 No. 73 was formulated by the Chief Fisheries Officer for this effect. This statutory instrument is though questionable because there is no provision for the Chief Fisheries Officer in the Fish Act to make Statutory Instruments and Rules. This cause's enforcement complication as the instrument cannot be enforced in the Courts of Law

2.6.3 Limiting the minimum mesh size of gillnet.

Gillnets and hooks are selective and catch only certain sizes ranges of fish. The limitation on the number of nets per vessel amended in 2002 is the appropriate instrument to this effect. The minimum mesh size of gill nets of 127 mm (5 inches) was intended to avoid catching immature

Nile perch and Nile Tilapia. According to the National Report of the Frame Survey (2006) on Lake Victoria, there were 91,740 gillnets of less than 5 inches in 2006 while there were 54,454 gillnets of the same size in the year 2000. This 59% increase in the number of gillnets on the Ugandan part of Lake Victoria contributed to increased fishing pressure on the available fisheries resources.

2.6.4 Prohibition of certain fishing gears and methods

Mono-filament gillnets are banned because they highly non selective and as such catch a lot more fish compared to ordinary nets (NaFIRRI, 2006). In addition, they do not decay and continue to fish for a long time when lost (ghost fishers). Beach seines have been banned because most are not selective and are used on beaches in shallow inshore often breeding areas where they may destroy tilapia nests and nursery grounds for all other species (DFR, 2007). An increase in beach seines from 811 in the year 2000 to 1,425 in 2006 has been reported by the National Report of the Frame Survey (2006). This shows that more effort by the DFR is needed to destroy and stop use of these beach seines. Trawl nets have been banned because they are not selective and also sweep and destroy gear of small scale fishers. Cast-nets are prohibited because they used in breeding areas of tilapia (MAAIF, 2004). According to the National Report of the Frame Survey (2006) for Lake Victoria, there were 811 cast nets in the year 2000. Dynamites and Poison are all highly unselective and use of poison kills other organisms and makes the fish unsuitable for human consumption.

2.6.5 Restricting fishing during certain times and seasons

Closed seasons are intended to stop fishing during critical time in the fishery such as the breeding season. Closed seasons have not been applied on Lake Victoria. However, it aimed at protecting juvenile of the larger species during the breeding season but has not been implemented by DFR since the colonial time. However, Section 9 of the Fish Act Cap. 197, of 2000 provides for closed seasons and states that the Minister may declare that during such a period as may be specified in the order, it shall be an offence to fish for any fish of any species specified in the order.

2.6.6 Limiting fishing in certain areas

Closed fishing areas are aimed at protecting certain species, biodiversity hot spots and development stages of particular species. Closed areas have also not been applied widely on Lake Victoria but there are some areas of the Lake with marine protected areas. Efforts are also being made to protect refugia of endangered species such as rocky outcrops, marginal areas, and satellite Lakes to protect endangered species. However, a closed area rule statutory instrument is being developed by DFR.

2.6.7 Limiting fishing power – vessel size and propulsion power

The size and propulsion power of the vessel determines how far the vessel can go and hence the available allowable fishing ground. On Lake Victoria, vessels less than 5m *(BawoTatu)* are prohibited because they fish mainly on the shorelines which are the breeding grounds of Tilapias and nursery areas for most fish species.

2.7 Fisheries Law enforcement

In Uganda, the Department of Fisheries Resources (DFR) of the Ministry of Agriculture, Animal Industry and Fisheries has overall control of all Monitoring, Control and Surveillance (MCS) patrols related to fisheries on lakes. Surveillance activities are generally undertaken in close collaboration, and resource sharing, with other stakeholders such as Marine Police, Local Government fisheries staff and BMUs where appropriate (LVFO, 2005). The Regulation Unit coordinates patrols to ensure that there is harmony and linkages between all agencies involved (MAAIF, 2006). However, this is not a legal provision but a working relationship between DFR and other stakeholders. For other agencies, there is lack of legal provisions for effective collaboration against abuse of the resource.

Recent national MCS operations in fisheries include the *"Save Samaki"* and" *Operation Clean"* initiatives involving collaboration between national agencies, including the security forces which had an emphasis on reducing illegal gears and smuggling across borders (LVFO, 2007). The Marine Police have conducted independent patrols to protect national waters and have the authority under the Fish Act to implement and enforce fisheries regulations (LVFO, 2005). Some of the districts undertake their own patrols either individually or collectively in collaboration with other local partners including BMUs.

Table 2.4: Illegal gear confiscations and 2008 Frame survey counts on Lake Victoria (Uganda)

Illegal gears	No. of confiscated gears (2004 - 08	Frame survey (Prov. 2008)
Beach seines	2,522	1,960
Monofilament nets	5,863	11,196
Undersized gillnets	16,867	67,836

Source: Okware, P. (2008). Compliance to fisheries regulations and use of indigenous knowledge in fisheries management.

Data presented in Table 2.4 indicates the number of illegal fishing gears confiscated by law enforcement personnel during MCS operations on Lake Victoria (Uganda). The data shows that undersized gillnets were the common illegal fishing gears on Lake Victoria (Uganda). Beach seines were the less confiscated gears. According to Okware (2008), the operations done towards compliance involved; border operations to intercept containers of illegal fishing gears imported into the country; intelligence based land and water operations targeting hot spots for the capture and processing of undersized fish; operations in fish markets and impromptu road blocks targeting dealers in undersized fish and; BMU patrolling their areas with security agencies.

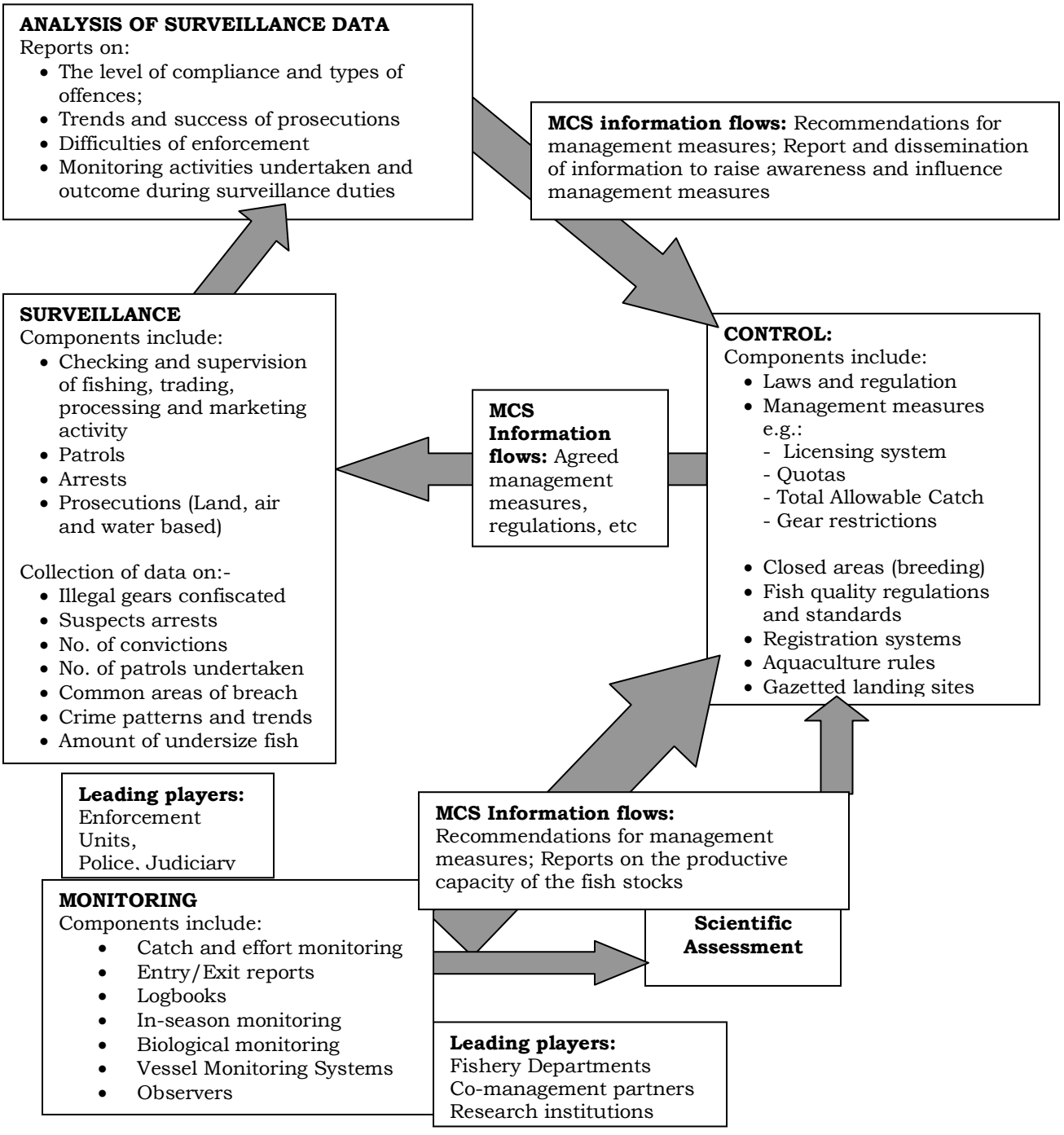
Table 2.5: Results of MCS operations on Lake Victoria (2003 – 2008)

Cases	Total for East Africa	Total for Uganda alone
No. of suspects apprehended	3,446	639 (19%)
Canoes impounded/destroyed	944	689 (73%)
Fish impounded (kgs) mixed tilapia, Nile perch and Dagaa	157,812 kgs	61,867 (39%)
Vehicles impounded	54	27 (50%)

Source: Okware, P (2008).

Table 2.5 indicates that Uganda constituted the biggest number 689(73%) of canoes impounded/destroyed for fishing illegalities in East Africa. However, few suspects in Uganda 639 (19%) were apprehended relative to other two partners states. The quantity of fish impounded in Uganda is also high in the region 61,867kgs (39%).

To achieve successful enforcement operation, it is important to first of all carry out a sensitization exercise (FAO, 2001). The exercise is normally done in form of community awareness programs, for instance stakeholders' workshops, fisher barazas, posters, brochures and radio programs are conducted. This is followed by operations on land and in water (fishing grounds, markets, gear dealers' premises, inspection at landing sites and transport vehicles, etc.). The officers carrying out the operations have powers vested in them as Authorized fisheries Law enforcement Officers in the Fish Act. These include: power to search, seize, arrest and prosecute offenders. The operation is finalized by seizure and destruction of illegal gears/items, undersize fish, arresting suspects and producing them to Police. MCS therefore is cyclic (Fig. 2.3).



Source: LVFO (2005: 48)

Figure 2.3: Linkages and information flows within the MCS process

Figure 2.3 indicates that to achieve successful enforcement operation, it is important to first of all carry out a sensitization exercise. The exercise is normally done in form of community

awareness programs, stakeholders' workshops, fisher barazas, posters and radio programs. This is followed by operations on land and in water (fishing grounds, markets, gear dealers' premises, inspection at landing sites and transport vehicles, etc.). The officers carrying out the operations have powers vested in them as Authorized Officers in the Fisheries Acts of the three states. These include: power to search seize, arrest and assist in prosecution of offenders. The operation is finalized by seizure and destruction of illegal gears/items, undersize fish, etc.

An example of results of an MCS operation is the quantity of items seized and culprits arrested. For instance, LVFO (2005) indicates that: in Uganda during June to July 2004 *'Operation Clean'* exercise, a total of 2600 beach seines, 84,165 undersize gill nets and 93,733 hooks were confiscated. In Kenya during the year 2004, a total of 221 beach seines, 2363 undersize gill nets and 306 hooks were confiscated while in the same period in Tanzania, 1078 beach seines, 6126 undersize gill nets, 581 mosquito seines and 253 monofilaments were confiscated".

The main challenge regarding the various options for controlling access and allocation is law enforcement (Okwach et al, 2005). On Lake Victoria, it was planned that involvement of BMUs in management of the fisheries will improve appreciation on the relevance of the measures and improve compliance (MAAIF, 2003). Some of the outstanding issues such as the mesh size for Dagaa and right size of hook are being dealt with by DFR.

2.8 Socio – economic status of the fishermen on Lake Victoria

Besides, the poor living conditions of almost all fishing communities in Uganda are extremely very poor (NEMA, 2002). In 1994, 65% of all the landing sites reported poor conditions. Due to poor sanitation, there is high likelihood of prevalence of a number of diseases such as malaria and other waterborne diseases including dysentery, bilharzias, diarrhea and sometimes cholera

and typhoid let alone HIV/AIDS. Just like their counterparts in some other parts of the world, the fishermen in Uganda are generally very poor people (Muhoozi, 2002). Although the fishermen are assured of a daily income, they still remain below the poverty line (Muhoozi, 2002). One of the methods such as smoking that they use to preserve the fish not only poses a health hazard but also, to some extent, is the major cause of localised deforestation for fuel wood used in fish smoking (NEMA, 2006).

A study by Omwega, Abila and Lwenya (2005) revealed that fishing is an important source of livelihood for many Kenyans for many years. It is also an important source of animal protein, especially for most people living around the lake. In theory fishers of Lake Victoria are regarded as the poorest group of people in all sectors of the economy. Looking at the way they live, the way they look, assets they own, saving habits and their family sizes one wonders (Omwega *et al.,* 2005). When one enters at the beach and look at the fishers, most of them look weak, poorly dressed, drunk and live in poor housing structures. They have many dependants, wives, orphans and widows to feed. Since fishing is an important source of livelihood for many people, the implementation and enforcement of the Fish Act needs to consider the socio-economic status of the fisher folk.

2.9 Challenges of Implementing the Fish Act to Conserve Fisheries Resources on Lake Victoria.

According to Odada *et al* (2004), over – exploitation of the fisheries resources has occurred in Lake Victoria. There has been an increase in total fishing effort, efficiency of fishing gear and extension of fishing grounds to maintain the yield, with a progressive decline in catch per unit

effort (CPUE) and mean size of fish caught (Mkumbo and Cowx, 1999). In all 3 countries, efforts in terms of boats and numbers of fishermen have more than doubled in the past 10 years (Namisi, 2000). The number of fishermen in Lake Victoria increased from about 84,000 in 1990/1991 to about 122,000 in 2000 (Asila, 2001). With increased fishing pressure, predation, and competition among species, the multi species fishery of Lake Victoria fishery has changed to only 3 species: Nile perch (*Lates niloticus*), the pelagic cyprinid like (*Rastrioneobola argentea* Pellegrin), and the introduced tilapiine (*Oreochromis niloticus*). By 1998, total Nile perch catches were half those at the beginning of the decade despite increased effort, and catches of *rastrineobola argentea* which also leveled off despite increased effort (Othina, 1999). Bwathondi, Ogutu-Ohwayo and Ogari (2001) argue that the unrestricted access status of the lake and lack of enforcement of existing legislation are linked to increasing and crippling fishing effort.

Overexploitation is also related to technological change. Changes in the efficiency of fishing gears, motorization of canoes and increase in total fishing effort to maintain production have contributed to the decline of the Nile perch since the mid-1990s (Bwathondi *et al.,* 2001). Most of the East African region's factories suffer from fish supply problems, attributed to low catches and competition with other fish factories (SEDAWOG, 1999) and in order to stay operational, they drive fishermen to catch more fish. Increased effort has been driven by a much greater demand for fish by recently established fish processing factories that have a large capacity for processed products (Abila, 2002). Nile perch fisheries opened up greater employment opportunities, attracting more fishers (Artisanal to large-scale), more fishing gear and vessels to access the resource, and the establishment of fish filleting factories (Bwathondi *et al,* 2001).

Dwindling fish stocks are necessitating increased effort in terms of implementation and enforcement of the law in order to maintain the same level of catch.

According to Odada *et al* (2004) there has been a reduction in mesh size of nets used, and an increased proportion of immature fish in the catches. Mesh sizes have progressively declined over the past 10 years or so with 24% of the nets in Uganda below the recommended mesh size of 5 inches, and more recent beach surveys (L. Muhoozi, cited in Bwathondi *et al*, 2001) suggest that this is as high as 50%. In Kenya and Tanzania, 3 and 18%, respectively, the gill nets are below the legal mesh size limits (ibid.). Trends (1987 – 1997) in percentage contribution by weight of the 4 major fishing gears to the Kenya Lake Victoria catches show that mosquito seine and beach seine landings have increased despite a ban on their use, while the gillnet and long-line contributions have declined (Othina, 1999). Rent-seeking behavior probably accounts for up to 20% of the contribution to destructive fishing practices. Beach seines and trawls (10 of which were operating in Kenyan waters until recently) are banned gears in the region (Bwathondi *et al*, 2001).

Odongkara and Okaronon (1999) noted that technological change has come about mainly due to demand for large volumes of high quality fish to supply the fish processing factories driven by the huge export market. A number of fish processing plants have been constructed along the shores of the lake, with 16 licensed to operate in the Uganda sector of the lake (DFR, 2008). The large number of processing factories in Uganda, whose capacity is about 180,000 tones (t) *versus* the total process – able fish landings for the Uganda part of Lake Victoria of 220, 800 tones, is an important driver of overexploitation of the fishery.

Bwathondi *et al,* (2001) found that excessive cropping in the establishment of the Dutch Government sponsored fish meal plant in Mwanza, Tanzania in the 1970s contributed substantially to the decline of the *haplochromines* in the lake. Of the factories currently operating in the region, the majority commenced operations after 1990, an indication of the region's relatively recent entry into the global fish market (SEDAWOG, 1999). Fifteen out of 25 factories surveyed in the region have been obliged to close down at least once between 1997 and 1998 to carry out modifications so as to comply with EU import regulations. Substantial value processed are small sized and immature driven by the demand from export markets, for small sized fillets, which are less fatty and provide portion-sized fillets (Muhoozi, 2002).

Abila (2002) indicates that the high demand for processed fish products is driven mainly by the large export market for Nile perch fillets that emerged in the early 1990s. The marketing of Lake Victoria's fish was localized within the riparian states during the pre-Nile perch era, but as most fish filleting factories were established in the 1990s, both the regional and international trade expanded. Increasing human populations within the lake basin, poor governance in the fishing industry, and the unrestricted access status of the lake are secondary drivers to high demand for export market.

With the reduction in catch per unit effort and landings per boat, the gap between the richest and poorest fishers on Lake Victoria has widened, and the gap between the benefits obtained from the fishery by vessel owners and employed fishermen has also widened (Othina, 1999). In addition, the scarcity of fish has led to increased fish prices at the landing sites (Bwathondi *et al,* 2001). Firms with more purchasing power have displaced processors who were unable to compete for the reduced landings. Some of these processors were as a result forced to close

down. This has led to negative impacts in the fisheries sector and has intensified existing conflicts between users (Yongo, 2000). Most of the region's factories suffer from fish supply problems, attributed to low catches and competition with other fish factories (SEDAWOG, 1999).

2.10 Environment threats to Lake Victoria Fishery

Odada et al (2004) noted that Lake Victoria is an international water body that offers the riparian communities a large number of extremely important environmental services. However, over the past three decades or so, the lake has come under increasing and considerable pressure from a variety of interlinked human activities such as over fishing, species introductions, industrial pollution, eutrophication, and sedimentation.

Likewise, Hecky and Bugenyi (1992) noted that over-fishing, siltation from the erosion of deforested watersheds, species introductions, industrial pollution, eutrophication, and climate change are all contributing to a host of rapidly evolving changes in the lake (and the other East African Lakes) that seriously threatens its ecosystem function and overall diversity. This implies that despite the existence of the Fish Act of Uganda, the problem of over-fishing has not been solved.

According to Hecky (1993), nearly half of the Lake Victoria floor experiences prolonged anoxia (lack of oxygen) spells for several months of the year compared to few decades ago when anoxia was sporadic and localized. Algal biomass concentration is almost 5 times greater in the surface waters than reported in the 1960s (Mugidde, 1993), which indicates higher rates of photosynthesis. Also, the transparency values have decreased to one third, and the silica concentration has gone down to one tenth of what they were about 40 years ago (Lehman, 1996).

These and other related environmental changes, arising out of natural or anthropogenic causes, have significantly impacted Lake Victoria's fish populations. For example, the extinction of several hundred species of haplochromine cichlid fish in Lake Victoria, primarily as a result of the introduction of the Nile perch, remains a single most dramatic event of vertebrate species extinction attributable to specific human activities (Johnson et al, 1996).

2.10 Gaps

No study has been conducted to analyse the implementation and enforcement of the Fish Act in Uganda especially on Lake Victoria. A major loophole in the implementation of the Fish Act is lack of implementation of closed seasons regulations, irregular enforcement operations, a weak link with the Local Government staff/communities and a limited coordination between other stakeholders. Most important, this review has established that the Fish Act is not only outdated but also hasn't been adequately implemented.

CHAPTER THREE

MATERIALS AND METHODS

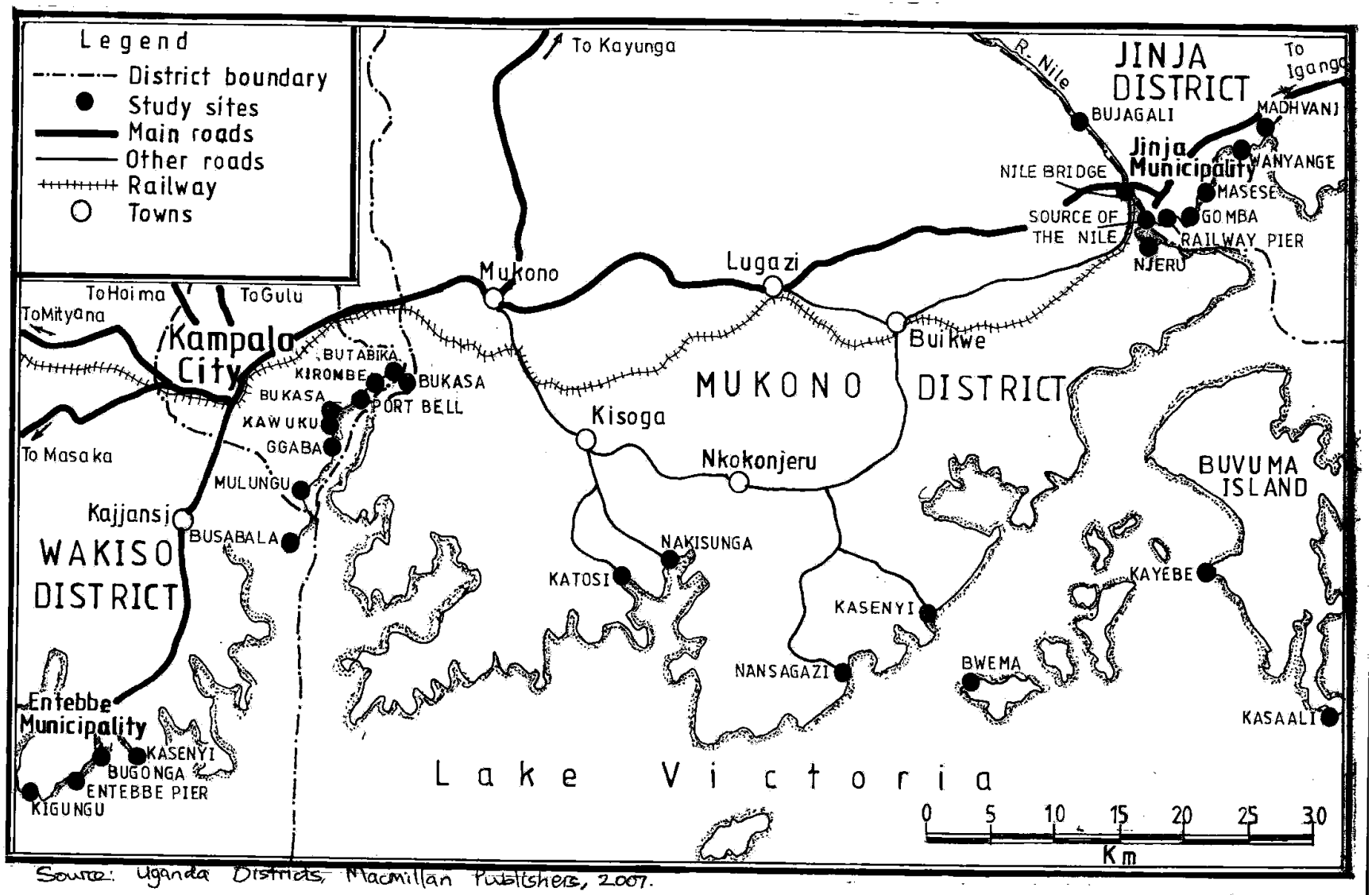
3.1 Research Design

A cross – sectional survey method as described by Creswell (2003) was used to gather different views about the implementation and enforcement of the Fish Act in Uganda and views on exploitation and conservation of fisheries resources on Lake Victoria. Both qualitative and quantitative data were collected. Data was collected using questionnaires, interview guides, direct observation and review of relevant literature about implementation and enforcement of the Fish Act, Cap.197 (2000). Primary data was sought from the fisher folk, Fisheries Law enforcement personnel, Commissioner for Fisheries, chairpersons of the BMUs, Local Council I (LC1) leaders, LVFO officials and fish processors and exporters around Lake Victoria.

3.2 Location of Study Sites

The study was carried out at 32 fish landing sites on Lake Victoria in the Districts of Wakiso, Kampala, Mukono and Jinja districts (Figure 3.1) selected because of the comparatively high level of fishing activity taking place in those Districts (DFR Export and production data, 2007). These areas also had high incidence of fishing malpractices and illegalities reported to the Central Fisheries Services (MAAIF, 2006).

Figure 3.1 Location of BMUs that participated in the study



3.3 Study Population

The study was conducted among the fisher folk in 32 landing sites (fishers included fishermen, coxswains, fish transporters, and fish traders), fisheries Law enforcement personnel, fish processors and exporters, members of Beach Management Units (BMUs), LVFO officials and Commissioner for Fisheries (Table 3.1).

Table 3.1: Categories of study participants

Category	**Position**	**Number**
Key Informants	Chairpersons of the BMUs	04
	Local council I leaders	04
	LVFO officials	02
	Fish processors and exporters	02
	Commissioner for Fisheries	01
Respondents for structured interviews	Fisher folks from fishing villages in the 4 districts	120
	Fisheries law enforcement personnel	30
Total		**163**

3.4 Sampling techniques

Due to the scattered nature of fish landing sites, the study involved purposive sampling (Amin, 2005). The sampling was based on Uganda part of Lake Victoria at fish landing sites in the districts of Wakiso, Kampala, Mukono and Jinja. The choice of the fish landing sites in these districts was based on the high level of fishing activities taking place and also the high incidence of illegal fishing practices (MAAIF, 2006). Using systematic random sampling, 8 BMU's were

selected from each district for study. By dividing the total number of BMU's in each district by 8, a sampling interval was obtained and used to select fishing sites studied (Table 3.2.)

Table 3.2: Name and location of BMUs that participated in the study

District	Name of BMUs that participated in the study
Wakiso District	Entebbe Pier, Kasenyi A, Bugonga, Bukasa, Busabala and Kigungu
Kampala District	Port bell, Kirombe, Bukasa (Butabika), Ggaba, Kawuku, Mulungu and Ngege
Mukono District	Kasenyi B, Nsazi, Katosi, Nakisunga, Njeru, Kayembe, Bweema and Kasaali
Jinja District	Masese, Bujagali, Railway pier, Wanyange, Madhvani, Source of the Nile, Gomba and Nile Bridge

Lists of names of the fisher folk in each of the above BMU's were obtained from the chairpersons of the BMUs and used for sampling. Using Krejcie and Morgan (1970) Table of Sample Size Determination, 120 fisher folk were selected by random sampling. Random sampling was also used to select fisheries Law enforcement personnel in all the four Districts.

Purposive sampling as described by Amin (2005) was used to select the Key Informants (KIs) who constituted the Commissioner for Fisheries, chairpersons of the BMUs, Local Council I leaders, LVFO officials and fish processors and exporters in the areas studied. The chairpersons of the BMUs, Local Council I leaders, LVFO officials were included in the study because they are partners with the government in enforcement of the Fish Act.

3.5 Sample size

163 respondents participated in the study including 120 fisher folk, 30 Fisheries Law enforcement personnel, the Commissioner for Fisheries, four chairpersons of the BMUs, four Local Council I leaders, two LVFO officials and two fish processors and exporters around the Uganda part of Lake Victoria.

3.6 Data Collection

The instruments for collection of qualitative data were interview schedules, guides, questionnaires and observation checklist. Document review was used to collect secondary data on results of implementation of the Fish Act. The instruments for collection of qualitative data are briefly described below:

3.6.1 Interview schedule

The interview schedule (Appendix 1) was designed and used to collect data from the fisher folk specifically for respondents that could not read and write. The Questions were administered in Luganda which was popularly spoken in studied fishing sites. This instrument provided qualitative data regarding factors affecting implementation and enforcement of the Fish Act on Lake Victoria. The respondents provided firsthand experience on enforcement of the Fish Act in their respective areas of operation.

3.6.2 Interview guide

An in-depth-interview guide (Appendix II) was formulated to aid discussion with the Commissioner for Fisheries, chairpersons of the BMUs, Local Council I leaders, LVFO officials

and fish processors and exporters in the areas studied using unstructured questions following Kilbir (1984). Information about evidence of arrests for fishing illegalities, prosecution of fishing criminals, and training in fishing management, meeting attendance, knowledge of legislation and management approaches was gathered using this instrument.

3.6.3 Questionnaire

The questionnaire (Appendix III) was administered to 30 fisheries law enforcement personnel from the landing sites studied. The questions were both closed and open ended to give more room for qualitative information needed from the respondents' experiences of implementation and enforcement of the Fish Act following the method described by Moser and Kalton (1983).

3.6.4 Observation checklist

An observation checklist (Appendix IV) was formulated and used to capture images regarding implementation and enforcement of the Fish Act on Lake Victoria that were not orally described. During the study, photographs of prohibited fishing gears, burning of prohibited fishing gear by the law enforcement personnel, sensitization of the fisher folk and images of immature fish loaded on trucks by fish sellers were captured. These observations were used to provide data on field enforcement and implementation of the Fish Act activities.

3.6.5 Document review

Documents review involving mainly annual DFR reports, MAAIF reports, technical papers, and statistical abstracts, was the main source of secondary data. During the study, information was sought from the Ministry of Agriculture, Animal Industry and Fisheries, LVFO records as well as Mukono, Wakiso, Kampala and Jinja district Local Government records. These were the main

sources of information about arrests, prosecutions, trainings, meeting attendance, knowledge of legislation and management approaches.

3.7 Reliability of Instruments

The interview schedules and questionnaire were pilot-tested in the study area in order to ensure reliability and consistency of the data to be collected as recommended by Amin (2005). Using SPSS software, Cronbach reliability coefficient for the interview schedule was computed as Alpha = 0.861 (Table 3.3) implying that the variables that were taken to measure implementation and enforcement of the Fish Act were highly correlated and therefore suitable for the purpose.

Table 3.3. Reliability Statistics

Cronbach's Alpha	No. of items
0.861	26

3.8 Data Processing and Analysis

Data was cleaned, coded and analyzed using Statistical Package for Social Scientists (SPSS) computer soft ware (Creswell (2003). Pearson Correlation was used to assess the relationship between implementation and enforcement of the Fish Act.

Qualitative data on the other hand were analyzed using content analysis in line with the research questions. Observed data including photographs of prohibited fishing gears and those taken while burning of prohibited fishing gear by the law enforcement personnel are presented. Qualitative data was analysed following Amin (2005) in line with different research questions.

CHAPTER FOUR

RESULTS

4.1 Background Characteristics of respondents

Both male and female respondents participated in the study as shown in Figure 4.1.

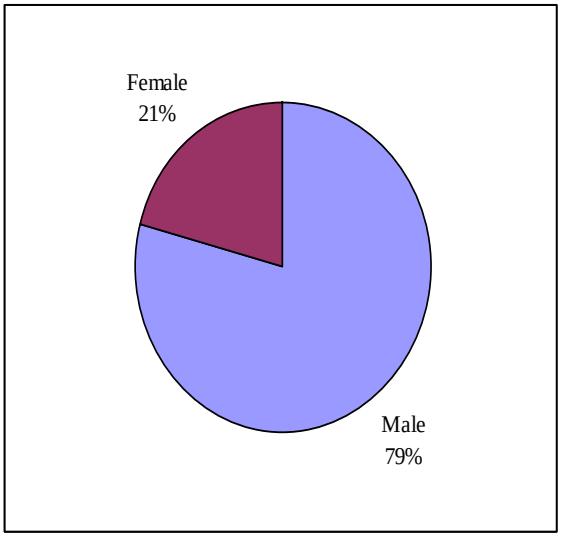


Figure 4.1: Sex of the respondents

79% of the respondents were male while 21% were females, suggesting that the majority of the people engaged in fishing activities were males (Figure 4.1).

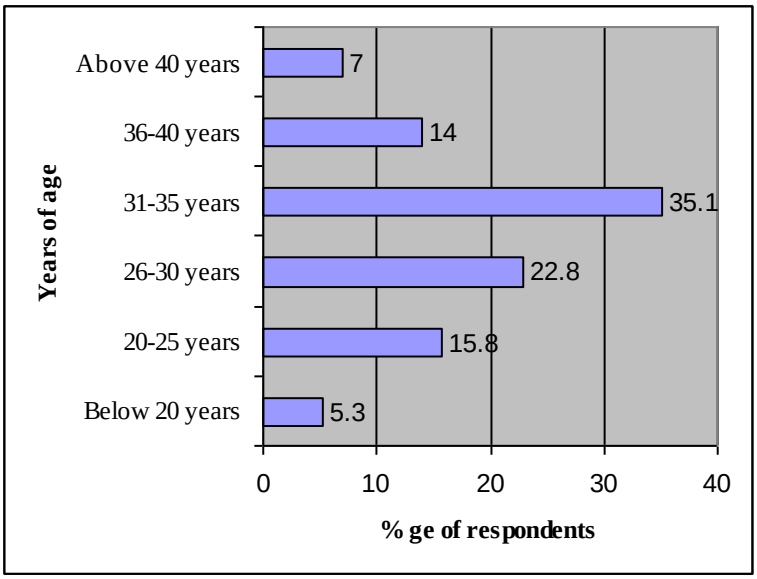


Figure 4.2: Age-group of respondents

35.1% were aged 31 to 35 years, 22.8% were 26 to 30 years of age while 15.8% of the respondents were 20 -25 years of age and 7% of the respondents were above 40 years of age (Figure 4.2).

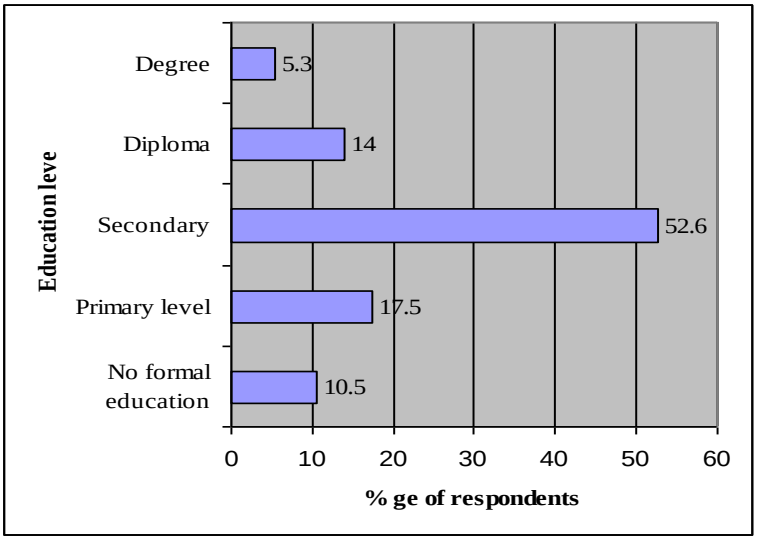


Figure 4.3: Education levels of respondents

The majority of the respondents (52.6) had secondary education while 17.5% had primary education and 10.5% no formal education (Figure 4.3).

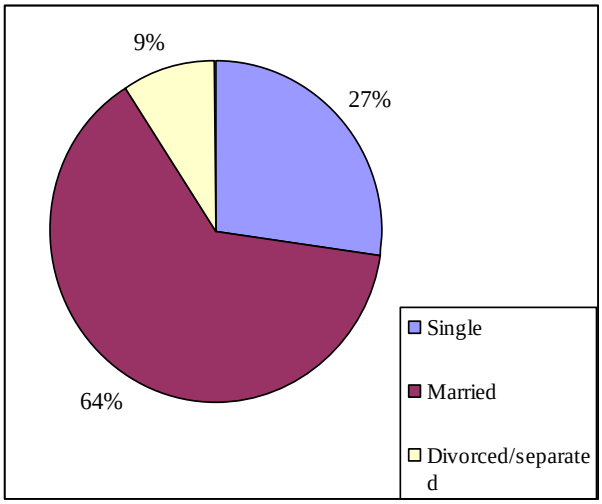


Figure 4.4: Marital status of respondents

The majority of the fisher folk (64%) were married while 27% of the respondents were single and 9% divorced/separated (Figure 4.4).

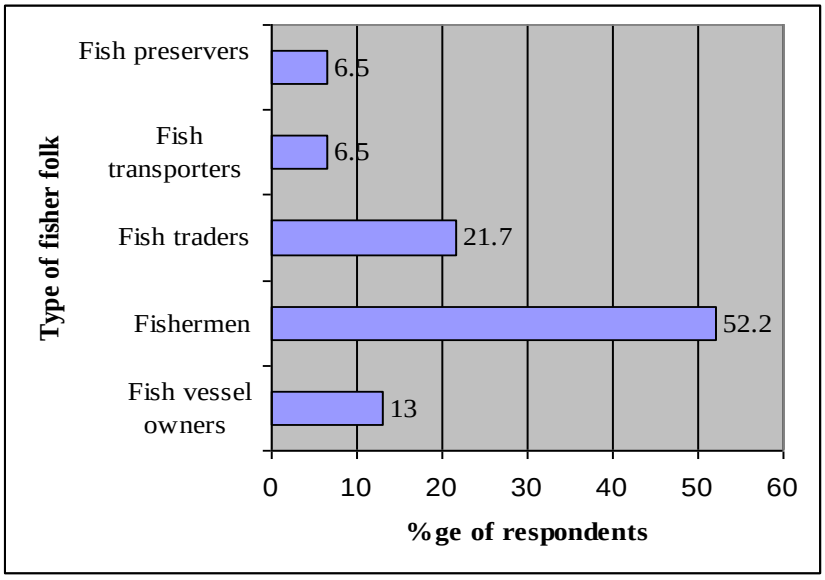


Figure 4.5: Category of the fisher folk who participated in the study

According to Figure 4.5, the majority of the fisher folk who participated in the study were fishermen (52.2%). A further 21.7% were fish traders while 13% were boat owners. Fish preservers and fish transporters constituted 6.5% each.

4.2 The Impact of the Failure to Implement the Fish Act and/or Inadequacy of the Fish Act on Lake Victoria Fisheries Resources

One of the objectives of the study was to "*highlight the impact of the failure to implement the Fish Act and/or inadequacy of the Fish Act on Lake Victoria fisheries resources"*. Several fishing illegal practices were observed at various study landing sites of Lake Victoria. This included use of undersize gill nets, fish poisoning, catching immature fish, fishing in breeding and nursery grounds, lack of fish movement permits and landing at non-designated landing sites among others. Field observations revealed use of undersize gill nets (Plate 4.1), fish poisoning (Plate 4.2), catching immature fish (Plate 4.3) and fishing in breeding grounds (Plate 4.4) were observed in several fishing sites on Lake Victoria.

Source: Field data (photograph taken in 2008)

Plate 4.1: Monofilament gill nets observed at Busabala fishing site in Wakiso district

Source: Field data (photograph taken in 2008)

Plate 4.2: Fishermen displaying fish caught by poison at Source of the Nile fishing site in Jinja district

Source: Field data (photograph taken in 2008)

Plate 4.3: Immature dry fish intercepted by Law enforcement personnel at Nakisunga Fishing site in Mukono district

Source: Field data (photograph taken in 2008)

Plate 4.4: Fishermen arrested while catching immature fish on Lake Victoria

The following statements were made by key informants to justify the occurrence of the observed vices on Lake Victoria.

> *"Although Section 35 of the Fish Act authorizes the review of the Fish Act to meet the changing circumstances, it has never been reviewed to provide for the number of licenses for fishermen on Lake Victoria, number of boats and nets per boat. Although the BMU Statutory Instrument 2003 No. 35 was enacted, it lacks backing of a Principle Law, because the Fish Act has no provision for community participation in fisheries management". It was wrongly drafted under section 43 which does not exist in the Fish Act, Cap. 197(2000). Similarly the Quality Assurance rules have the same scenario.*
> Respondent: Fisheries Inspector

> *"There is lack of adequate staff for implementation of the Fish Act. DFR has inadequate Fisheries Inspectors who are expected to enforce the Fish Act and other regulations in the whole Country. Although they are supposed to work in collaboration with Local Government staff, problems like poor communication, facilitation and limited authority over the Local Government staff provide a weak linkage and have hindered the efficient implementation of the Fish Act".*
> Respondent: Commissioner for Fisheries

Cast nets and undersize gillnets were the most cited fishing vices by the fisher folk (Table 4.1.

Table 4.1 Illegal Fishing practices reported by the fisher folk

Fishing malpractices	**Incidence of fishing vice**	**Percent**
Use of fish poison	07	5
Use of beach seines for fishing	17	12
Use of small seines for fishing	11	8
Use of undersize gillnets	34	23
Use of cast nets	46	30
Use of monofilament nets	23	15
Illegal boats	15	10
Total response	***153***	***128***
Valid response	**120**	**100.0**

Multiple responses

Use of cast nets was reported by 30% of the respondents while use of undersize gillnets was reported by 23% of the respondents. Other fishing vices included use of fish poison, monofilament nets, beach seines and undersized boats.

There were clear differences among different respondent categories regarding the adequacy of the Fish Act in ensuring sustainable exploitation and conservation of fisheries resources. The majority of the fisher folk (88.3%) agreed that implementation and enforcement of the Fish Act was adequate to ensure sustainable exploitation and conservation of fisheries resources. However, 66.7% of the law enforcement officers interviewed revealed that implementation and enforcement of the Fish Act were inadequate to ensure sustainable exploitation and conservation of fisheries resources. The difference in perception between these two categories of respondents

may have come as a result of differences in exposure to fisheries regulations and the extent of illegal practices on the Lake.

4.3 Factors affecting implementation and enforcement of the Fish Act on Lake Victoria

Regarding knowledge about the existence of the Fish Act, 91.7% of the fisher folk reported that they knew about the existence of the Fish Act (cap.197). In order to comply with the Fish Act, however, there was need for sensitization of the fisher folk about compliance as well as training of Law enforcement personnel on MCS. Both the fisher folk and Law enforcement personnel responses regarding sensitization and training about compliance with enforcement of the Fish Act are presented in Table 4.2

Table 4.2 Sensitization and training about compliance with the Fish Act

Response	**Category of respondents**	
	Fisher folk	*Law Enforcement Officers*
Yes	80 (66.7%)	28 (93.3%)
No	34 (28.3%)	2 (6.7%)
Non response	*6 (5.0%)*	*0*
Total	**120 (100.0)**	**30 (100.0)**

Table 4.2 indicates that the majority of the fisher folk (66.7%) were sensitized about compliance with the Fish Act compared to 28.3% who indicated that they had not been sensitized.

Source: Field data (photograph taken in 2008)

Plate 4.5: Sensitization of the fisher folk on fisheries Law at Katosi fishing site part of a wider sensitization program for Lake Victoria in Uganda.

Likewise, the majority of the Law enforcement officers (93.3%) indicated that they had been trained in enforcing the Fish Act. Indeed one BMU chairperson for Kasenyi landing site revealed that several sensitization meetings for the fisher folk had taken place in the area. According to him,

> *"Sensitization meetings for our fishing community addressed fisheries Law and regulations, licensing system, gear restrictions, gazetted landing sites, aquaculture rules, fish quality regulations and standards and closed breeding areas among others*."
> Respondent: BMU chairperson for Kasenyi landing site.

Despite of the sensitization meetings, however, illegal fishing activities continued to be reported and observed on various fish landing sites around Lake Victoria. Responses from the fisher folk revealed that several factors had affected efficient implementation and enforcement of the Fish Act in Uganda (Table 4.3.

Table 4.3 Factors that have hindered efficient implementation and enforcement of the Fish Act in Uganda.

Factors	**Frequency**	**Percent**
High cost of recommended fishing equipment	40	33.3
Shortage of law enforcement personnel	14	11.7
Limited awareness	12	10.0
Political interference	44	36.7
Corruption by some law enforcement personnel	39	32.5
Total response	*149*	*124.2*
Valid response	**120**	**100.0**

 # Multiple response

From the above fisher folk responses, it is clear that the causes for increased fishing illegalities were multi-dimensional. 36.7% of the fisher folk indicated that political interference was the major hindrance to efficient implementation and enforcement of the Fish Act in Uganda. A further 33.3% reported that the high cost of recommended fishing equipment was another factor leading to increased fishing illegalities on Lake Victoria. However, 32.5% indicated that fishing illegalities were due to corruption by some law enforcement personnel.

Table 4.4: Factors that were assessed to have contributed to increasing fishing Illegalities in Uganda

Factors	Number of citations by respondents	Percent
Shortage of equipment like patrol vehicles and communication gadgets	14	46.7
Shortage of personnel	8	26.7
Compromise by law enforcement personnel	17	56.7
Inadequate funds for implementation and enforcement activities	13	43.3
Limited awareness	4	13.3
Irregular fisheries enforcement activities	6	20.0
Limited support by stakeholders	2	6.7
Weak legislation	16	53.3
Poor coordination of implementation	5	16.7
Political interference	9	30.0
Government priorities are agro-based	7	23.3
Conflict of interest	4	13.3

 # Multiple response

A majority of the Law enforcement respondents (56.7%) attributed the increasing fishing illegalities to compromise by some Law enforcement personnel (Table 4.4). However, 53.3% of the Law enforcement personnel responses revealed weak legislation. Other causes of fishing illegalities were inadequate funds for implementation and enforcement activities (43.3%), political influence (30.0%), and shortage of personnel (26.7%), irregular fisheries enforcement activities (20.0%) and poor coordination and implementation of fisheries activities (13.3%).

4.4 The relationship between implementation and enforcement of the Fish Act

The fisher folk were asked to agree or disagree with several indicators of implementation and enforcement of the Fish Act as seen in Table 4.5 and 4.6.

Table 4.5: Implementation of the Fish Act in Uganda

Implementation of the Fish Act	Responses			N
	Agree	Undecided	Disagree	
1. I have been trained on how to comply with the Fish Act.	84 (76.4%)	4 (3.6%)	22 (20.0%)	110 (100.0%)
2. Directorate of Fisheries Resources has carried out sensitization meetings with the fisher folk on how to comply with fishing regulations	68 (68.0%)	2 (2.0%)	30 (30.0%)	100 (100.0%)
3. Our BMU has carried out sensitization meetings with the fisher folk on how to comply with fishing regulations	74 (66.1%)	0	38 (33.9%)	112 (100.0%)
4. Fishermen on this landing site use the recommended fishing gear.	104 (92.9%)	0	8 (7.1%)	112 (100.0%)
5. Demonstration of appropriate fish gears and fishing methods have been frequently done to fishermen on this landing site	94 (90.4%)	2 (1.9%)	8 (7.7%)	104 (100.0%)
6. Implementation of the Fish Act has been efficient at reducing fish malpractices	74 (92.5%)	0	6 (7.5%)	80 (100.0%)
7. The mass media is used to mobilize the fisher folk against fish malpractices.	16 (17.4%)	6 (6.5%)	70 (76.1%)	92 (100.0%)

Note: Variance in sample size (n) is due to no response

92.9% of the fisher folk agreed that fishermen on study landing sites used the recommended fishing gear (Table 4.5), 92.5% of the respondents agreed that implementation of the Fish Act had been efficient at reducing fish malpractices while 90.4% of the respondents agreed that demonstration of appropriate fish gears and fishing methods had been frequently done to fishermen on landing sites. 76.4% of the respondents were trained on how to comply with the Fish Act, 66.1% indicated that BMUs had carried out sensitization meetings with the fisher folk on how to comply with fishing regulations and that, the Department of Fisheries Resources had carried out sensitization meetings with the fisher folk on how to comply with fishing regulations

(68.0%). This information indicates that implementation activities for the Fish Act were carried out on various fishing sites. However, 76.1% of the respondents disagreed with the statement that the mass media was used to mobilize the fisher folk against fish malpractices. In regard to the role of the BMUs, the Commissioner for Fisheries added;

> *"Over the last five years, the Department of Fisheries resources established a co-management program on all landing sites. Consequently, BMUs have helped to supplement the few trained fisheries personnel to implement fisheries management measures like sensitization of the fisher folk. However, delegation of Fisheries Management especially in regulation and enforcement without adequate capacity building has created a problem."*
> Respondent: Commissioner for Fisheries.

This implies that although BMUs have been useful in implementation of the Fish Act, they haven't had enough capacity building to enforce the Law. Indeed, one LVFO official also reiterated the above observation that;

> *"The persons leading BMUs for most of the areas have been part of the fishing community and most times are complacent to mal-fishing practices. Others lack capacity and knowledge in managing fisheries"*
> Respondent: LVFO official

Despite the varied levels of skills and capacity of BMUs, information from Law enforcement personnel revealed that they carry out day-to-day surveillance of the fishery resources, are involved in conservation measures, improving the beach hygiene, participate in data collection, handle emergencies at the beach level and resolve conflicts.

There were two main areas of disagreement regarding enforcement of the Fish Act (Table 4.6). That mono-filament gillnets are no longer used for fishing on Lake Victoria as disagreed by 52.7% and that searches for immature fish, illegal nets/gears were common on landing sites as disagreed by 70.8% of the respondents.

Table 4.6: Enforcement of the Fish Act in Uganda

Enforcement of the Fish Act	Responses			n
	Agree	Undecided	Disagree	
1. Ensuring compliance to fisheries laws and regulations remains a challenge in this area	74 (69.8%)	4 (3.8%)	28 (26.4%)	106 (100.0%)
2. Several fishermen with illegal fishing gear have been arrested on this landing site	120 (100.0%)	0	0	120 (100.0%)
3. Fishermen who land undersize fish have been arrested on this landing site	78 (95.1%)	0	4 (4.9%)	82 (100.0%)
4. Mono-filament gillnets are no longer used for fishing on lake Victoria	52 (47.3%)	0	58 (52.7%)	110 (100.0%)
5. Fishermen on this landing site use the recommended fishing gear.	106 (93.0%)	2 (1.8%)	6 (5.2%)	114 (100.0%)
6. There are weak institutions and institutional processes for Monitoring Control and Surveillance on Lake Victoria	86 (82.7%)	4 (3.8%)	14 (13.5%)	104 (100.0%)
7. There has been destruction of illegal gears/items, undersize fish by law enforcement personnel on this landing site	110 (100.0%)	0	0	110 (100.0%)
8. Controlling the use of destructive and illegal fishing gears and methods have remained a challenge on L. Victoria	104 (92.9%)	0	8 (7.1%)	112 (100.0%)
9. Controlling capture and trade in immature fish is still a problem on L. Victoria	78 (86.7%)	0	12 (13.3%)	90 (100.0%)
10. Fishermen who use illegal fishing methods are prosecuted.	98 (89.1%)	2 (1.8%)	10 (9.1%)	110 (100.0%)
11. Searches for immature fish, illegal nets/gears are common on this landing site.	28 (29.2%)	0	68 (70.8%)	96 (100.0%)
12. There is an efficient water patrol system on the waters of Lake Victoria	70 (66.0%)	0	36 (34.0%)	106 (100.0%)
13. Illegal fishing equipment is usually seized on this landing site	94 (90.4%)	2 (1.9%)	8 (7.7%)	104 (100.0%)

Note: Variance in sample size (n) is due to no response

Respondents agreed with the following Fish Act enforcement measures (Table 4.6): that several fishermen with illegal fishing gear have been arrested on landing sites (agreed by all the fisher folk respondents), that there has been destruction of illegal fishing gears/items, undersize fish by Law enforcement personnel on landing sites (agreed by all the fisher folk respondents), fishermen who land undersize fish have been arrested on landing sites (supported by 95.1% of the respondents) and that fishermen on landing sites use the recommended fishing gear (93.0%).

In addition, 92.9% of the respondents agreed that controlling the use of destructive and illegal fishing gears and methods have remained a challenge on Lake Victoria, illegal fishing equipment is usually seized on this landing site (90.4%) and, that controlling capture and trade in immature fish is still a problem on Lake Victoria (86.7%) among others. However, 70.8% of the respondents disagreed with the statements that searches for immature fish, illegal nets/gears are common on landing sites and, that mono-filament gillnets are no longer used for fishing on Lake Victoria (disagreed by 52.7% of the respondents). However, during the study, enforcement of several provisions of the Fish Act were observed; namely; confiscating of under size gill nets and arresting of culprits by the police officers (see plate 4.6), destruction of immature fish confiscated from fishermen (see plate 4.7), destruction of scoop nets by BMU staff (see plate 4.8) and destruction of illegal under-sized boats (see plate 4.9).

Source: Field data (photograph taken in 2007)

Plate 4.6: Confiscating of under size gill nets, Beach seines and arresting of culprits by the Police officers at Old Port Bell Ngege fish landing site.

Source: Field data (photograph taken in 2007)

Plate 4.7: Destruction of immature fish confiscated from fishermen at Kasenyi fishing site

Source: Field data (photograph taken in 2008)

Plate 4.8: Destruction of seine nets by BMU staff at Masese fishing site in Jinja

Source: Field data (photograph taken in 2008)

Plate 4.9: Destruction of illegal under – sized boats at Ggaba fishing site. These are Outlawed because they are used to fish in breeding and nursery grounds hence being destructive.

The information above therefore, indicates that the DFR together with Local Governments and BMUs have put considerable effort to enforce the Fish Act regulations. The effort of DFR in fighting against fisheries malpractices on Lake Victoria is further evidenced in the role of MCS Patrol in apprehending the suspects; confiscating beach seines, undersize gillnets, cast nets, monofilament nets and boats; as well as impounding immature fish. The results of the MCS patrol activity for October 2006 to September 2007 are presented in Table 4.7.

Table 4.7: MCS Patrol results for the period October 2006 to September 2007 on Lake Victoria

Patrol activity	*No. of suspects apprehended*	*Beach seines*	*Undersize gillnets*	*Cast nets*	*Monofilament nets*	*Boats*	*Fish impounded/ destroyed (Kgs)*
1st patrol	4	74	300	-	478	-	20,970
2nd patrol	10	22	354	8	86	31	1920
3rd patrol	5	20	718	5	37	31	3350
4th patrol	8	15	441	4	24	30	6620
5th patrol	6	6	43	3	10	17	1200
6th patrol	23	10	315	8	5	6	2500
Total	**56**	**141**	**1813**	**25**	**626**	**102**	**35360**

Source: IFMP-MCS Progress Report

From the above table, it is indicated that during the period October 2006 to September 2007, the MCS national patrol team conducted 6 patrols on Lake Victoria. During these patrols, several illegal gears were confiscated, immature fish destroyed/impounded and suspects apprehended. Notable in the results are the 35,360kgs of immature fish impounded and 56 suspected offenders apprehended. Although, the Fish Act provides authority for prosecution of offenders, this study did not find any evidence of prosecution of offenders.

The study also examined the relationship between implementation and enforcement of the Fish Act of Lake Victoria (Uganda). Pearson product moment correlation was used to establish the relationship between the two variables (Table 4.8).

Table 4.8: Pearson correlation coefficient showing the relationship between Implementation and Enforcement of the Fish Act.

		Implementation of the Fish Act	Enforcement of the Fish Act
Implementation of the Fish Act	Pearson Correlation	1	-.152
	Sig. (2-tailed)		.015
	N	116	114
Enforcement of the Fish Act	Pearson Correlation	-.152	1
	Sig. (2-tailed)	.015	
	N	114	114

There was a negative relationship between implementation of the Fish Act and enforcement of the Fish Act ($r = 0.152$; $p < 0.05$) implying that better implementation of the Fish Act reduces enforcement activities for compliance with the Act. The insignificance of the results as well as the low Spearman correlation ($r = -0.152$) were probably due to the fact that the terms "implementation and enforcement" appeared similar and were likely to have been confused by respondents.

4.5 The relationship between the implementation of the Fish Act and level of malpractices and resource destruction in Lake Victoria (Uganda)

Respondents were asked if they considered that implementation of the Fish Act had a relationship with the level of fishing malpractices on Lake Victoria (Table 4.9).

Table 4.9: The relationship between implementation of the Fish Act and level of malpractices

Response	**Frequency**	**Percentage**
Yes	100	(83.3%)
No	14	(11.7%)
Non response	*6*	*(5.0%)*
Total	**120**	**(100.0)**

The majority of the fisher folk (83.3%) agreed that implementation of the Fish Act had a relationship with the level of fish malpractices on Lake Victoria. However, all the law enforcement personnel indicated that implementation of the Fish Act was inadequate to ensure conservation of fisheries resources. The level of fish malpractices and resource destruction had continued despite implementation of the Fish Act. This observation was supported by one fish processor and exporter that:

> *"These days, fisheries resources in Lake Victoria have reduced due to increased exploitation. With the scramble for the finite fisheries resources between factories, regional traders and domestic consumers; illicit trade of immature fish has increased."*
> Respondent: Fish processor and exporter

Competition for fisheries resources had accelerated mal-fishing practices and consequently, over-exploitation of the fisheries resources. One Law enforcement personnel said: "increased exploitation was due to weak laws, open policy of exploitation and increased registration of fishermen". Consistent with the findings, DFR Monitoring, Control and Surveillance report for 2008 revealed that sensitization for the fisher folk on Nsazi, Katosi and Bugonga landing sites were carried out in the month of August 2008, just one month after the sensitization (in September 2008), several fish illegal gears were confiscated on the same landing sites (Table 4.10).

Table 4.10: Occurrence of fishing vices and confiscation of illegal gears

Fish landing site	No. of illegal gears/fish confiscated in September '08	No. of illegal gears confiscated in October '08
Bugonga	18 beach seines	6 beach seines
Nsazi	300 undersized gill nets	80 undersized gill nets
Katosi	Over 400 beach seines and over 100bags of immature fish	Over 35 beach seines

Source: MCS report for September to October 2008

The information in Table 4.10 reveals that illegal fishing practices were ongoing in the area. The reasons advanced by the fisher folk to support the view that the Fish Act had reduced exploitation of fisheries resources were the increased denial of licenses and fishing permits by DFR, increased awareness about conserving fisheries resources and encouragement of fish farming. The difference in perception by the Law enforcement personnel and fisher folk is probably explained by the level of awareness by the two categories of people whereby the Law enforcement personnel are more informed due to their access to monitoring data than the fisher folk.

The statistical relationship between the implementation of the Fish Act and level of malpractices and resource destruction on Lake Victoria was established using Pearson product moment as presented in Table 4.11.

Table 4.11: The relationship between the implementation of the Fish Act, level of Malpractices and resource destruction on Lake Victoria.

		Implementation of the Fish Act	Fish malpractices	Resource destruction
Implementation of the Fish Act	Pearson Correlation	1	-.152	-.088
	Sig. (2-tailed)		.105	.358
	N	116	114	112
Fish malpractices	Pearson Correlation	-.152	1	.257**
	Sig. (2-tailed)	.105		.007
	N	114	114	110
Resource destruction	Pearson Correlation	-.088	.257**	1
	Sig. (2-tailed)	.358	.007	
	N	112	110	112

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.11 shows the relationship between implementation of the Fish Act, level of malpractices and resource destruction on Lake Victoria. The results indicated that there was an insignificant

negative relationship between implementation of the Fish Act and fish malpractices on Lake Victoria ($r=-0.152$; $p > 0.05$). This means that improvement in implementation of the Fish Act will have an impact of reducing fish malpractices on Lake Victoria.

Generally, a negative relationship between implementation of the Fish Act and resource destruction on Lake Victoria ($r=-0.088$; $p > 0.05$) was noted. This implies that improvement in implementation of the Fish Act will reduce resource destruction on Lake Victoria. The insignificance of the results as well as the low Spearman correlation were probably due to the fact that the terms "implementation of the Fish Act, level of malpractices and resource destruction" appeared similar and were likely to have been confused by respondents.

Finally, the study found a significant positive relationship between fish malpractices and resource destruction ($r = 0.257$; $p < 0.05$). This implies that increase in fish malpractices correspondingly increase the fisheries resource destruction and vice versa.

To summarize the findings for this objective, the study established that implementation of the Fish Act had an inverse relationship with fish malpractices and resource destruction on Lake Victoria. While the majority of the fisher folk indicated that the Fish Act had reduced exploitation of fisheries resources, the majority of the law enforcement personnel were of the view that the Fish Act had increased exploitation of fisheries resources.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

The results of the study revealed that 88.3% of the fisher folk respondents indicated that the current Fish Act has out lived its objectives. Considering the expressed requirements and expectations of the fisher folk, there is a likely need to revise the Fish Act. Section 35 authorizes the review of the Fish Act but this has to be done in light of the time to time changing circumstances. Even the Section has never been used to review or address a more pressing need of resource allocation by providing a formula or format for fisheries resource sharing between fishing communities, that is, the number of fishers, the number of licenses for fishers, number of boats and nets per boat permitted, and allowable fish catch limits on Lake Victoria.

Although the BMU Statutory Instrument of 2003 No. 35 was enacted, it lacks backing in the Fish Act as Fish Act does not specifically provide for community participation in fisheries management. Even the Fish (Fishing) Rules, of 2002 under section 35 of the Act are unclear because it talks of the Fish Act 1964 and yet the Laws were revised in the year 2000. In addition the Statutory Instrument No. 73 of 2001, The Fishing (Amendment) Rules, 2001 is also illegal because it is inconsistent with the Fish Act in regard to the length overall of boats to be licensed as it encourages licensing boats less than 28 feet. Also the Fish (Immature Fish) Instrument of 2002 No. 73 is inconsistent with the Fish Act as it was signed by the Commissioner for Fisheries and not the Minister responsible for fisheries. All the above somehow imply that there was failure to implement the Fish Act as well as inadequacy of the Fish Act in conservation of Lake Victoria fisheries resources.

Several fisheries illegalities were observed on various landing sites of Lake Victoria. For example, use of undersize gill nets, fish poisoning and catching immature fish were observed at Busabala and Ggaba fishing sites. The use of undersize gill nets was also highlighted by Okwach *et al* (2005) that many gill-nets and boat seines used by these fishermen were of illegal size. The fisher folk respondents went on to reveal that smaller mesh nets give fishermen bigger catch irrespective of the fish sizes. For example, instead of the 5-inch gill net that is recommended to catch Nile perch in Lake Victoria, the fishermen use 3.5-inch or 2.5-inch mesh nets. Although the Fish (Immature Fish) Instrument, 2002 No. 73 was formulated for this purpose, its is illegal in that it was signed by the Chief Fisheries Officer (Commissioner for Fisheries) who is not authorized to make legislation and its enforcement was also found lacking. Consequently, the fishing vices have resulted into over exploitation. This was highlighted by Odada *et al* (2004) that overexploitation of the fisheries resources has occurred in Lake Victoria. Mkumbo and Cowx (1999) further revealed that an increase in total fishing effort, efficiency of fishing gear and extension of fishing grounds to maintain the yield, with a progressive decline in catch per unit effort (CPUE) and mean size of fish caught.

Several factors attempt to explain the increase in fish illegalities on Lake Victoria. Bwathondi *et al*. (2001) argue that the unrestricted access status of the lake and lack of enforcement of existing legislation are linked to increasing and crippling fishing effort. This is another gap in the Fish Act that because there is no law to limit entry into fishing. Despite the gaps within the Law several attempts to stop fishing mal-practices were reported by Okware (2008, p14) that:

"…the operations done towards compliance involved; border operations to intercept containers of illegal gears imported; intelligence based land and water operations targeting hot spots for

the capture and processing of undersized fish; operations in fish markets and impromptu road blocks targeting dealers in undersized fish and; BMU patrolling their areas with security agencies".

The study revealed that the majority of the fisher folk (91.7%) knew about the existence of the Fish Act (cap.197). This t indicated that the majority of the respondents were informed of the existence of the fish law and were therefore, expected to comply with it. The effective management of natural resource requires engagement of the resource users and attendant communities through sensitization as a starting point to achieve successful enforcement operation (FAO, 2001),. Ntiba *et al*. *(*2001) points out that the people's lack of awareness and ignorance of their rights and obligations in bringing about a conducive environment for a sustainable fishery may also undermine their effective participation in the management of their natural resources and fisheries in particular. Therefore, empowering the communities through sensitization on the management measures and statutory obligations is the first step toward effective management and consequently sustainable utilization of fisheries resources.

However, despite fishers and fisheries managers being sensitized and trained to some level in application Fisheries Law, the study found that illegal fishing activities continued to be reported and observed in various fishing sites around Lake Victoria. A similar observation by Kabuye (2005) indicated that there is excessive fishing effort coupled with use of destructive fishing methods and illegal gears despite the knowledge of law against such activities. Kabuye (ibid) further observed that the fisheries of Lake Victoria were dwindling and were at the time exploited at unsustainable levels due to lack of effective implementation and enforcement of the Fish Act (Cap. 197). Over fishing and the use of damaging or illegal fishing gear is only in part a reflection of the failure of Fish Act implementation strategies on the Lake, and is symptomatic of

broader social, economic, and developmental dislocations such as poverty and lack of employment.

Study findings by Nabongo (2007) are also consistent with the results of this study that use of various fishing methods that impact the fisheries negatively including use of poison and explosives, barriers, pots and baskets, spears, dredges, traps, lampara, scoop nets, seine nets, trawl nets, trammel nets/ tangle net system, drifting or set gillnets of more than 30 MD, cast net and monofilament nets were on the rise and can be directly linked to inadequacies in the law and ineffective or lack of implementation of the very law.

Research findings revealed that several factors had hindered efficient implementation and enforcement of the Fish Act in Uganda. Political interference and high cost of recommended fishing equipment were the major hindrance to efficient implementation and enforcement of the Fish Act in Uganda. Poor and inconsistent surveillance was also cited, while failure in controlling this kind of fishing were cited as significant challenges in such vast and open waters fisheries of Lake Victoria. It can be also concluded that the causes for increased fishing illegalities are multi-dimensional, and that in additional to inadequacies of the regulatory nature and community complicity, physical and technological infrastructure limitations are also a major hindrance to sustainable utilization of the fisheries resources. This is in agreement with Bwathondi *et al* (2001) who cites the lack or inadequacy of handling facilities, ice plants, storage facilities, sanitary conditions (including boats with containers) at landing sites as contributing to poor fish quality and consequently making it impossible to fisheries managers and enforce the provisions of the Fish Act that are premised on availability of such infrastructure.

On the other hand, the study revealed that implementation of the Fish Act had registered various benefits. An example of results of the benefits was provided by LVFO (2005) that the quantity of items seized and culprits arrested indicate implementation efforts of the Fish Act. For instance, LVFO (2005) indicates that: "In Uganda during June to July 2004 *'Operation Clean'* exercise, a total of 2600 beach seines, 84,165 undersize gill nets and 93,733 hooks were confiscated". According to Okware (2008), these results were due to border operations to intercept containers of illegal gears imported; intelligence based land and water operations targeting hot spots for the capture and processing of undersized fish; operations in fish markets and impromptu road blocks targeting dealers in undersized fish and; BMU patrolling their areas with security agencies.

Among key actors cited as most important in implementation included the BMUs leaders and the Commissioner for Fisheries.. In regard to the role of the BMUs, the Commissioner for Fisheries added; "Over the last five years, the Department of Fisheries resources established a Co-management program on all landing sites. Consequently, BMUs have helped to supplement the few trained fisheries personnel to implement fisheries management measures like sensitization of the fisher folk. However, delegation of Fisheries Management especially in regulation and enforcement without adequate capacity building has created a problem". This implies that although BMUs have been useful in implementation of the Fish Act, they haven't had enough capacity building to handle fisheries issues effectively. In addition, the Fish Act, Cap.197 does not empower the Beach Management units to participate in licensing of fishing vessels though the BMU Rules enacted in 2003 clearly stipulate a number of functions for the BMU during licensing. Information from law enforcement personnel revealed that they carry out day-to-day surveillance of the fishery resources, are involved in conservation measures identification of breeding and nursery grounds and providing information of illegal fishers, improving the beach

hygiene, participate in data collection, handle emergencies at the beach level and resolve conflicts.

Regarding enforcement of the Fish Act, 100% of the respondents agreed that several fishermen with illegal fishing gear had been arrested on landing sites, that there has been destruction of illegal gears/items, undersize fish by Law enforcement personnel on landing sites, fishermen who land undersize fish have been arrested on landing sites, that fishermen on landing sites use the recommended fishing gear, controlling the use of destructive and illegal fishing gears and methods have remained a challenge on Lake Victoria, illegal fishing equipment is usually seized on this landing site and that controlling capture and trade in immature fish is still a problem on Lake Victoria among others. The reasons for prevalence of fish malpractices are partly provided by Othina (1999) that with the natural explosion of the Nile Perch and the boom in its export market, many more people who were never fishermen moved to cash in on the "lucrative" industry. The resulting competition may have pushed traditional fishermen to resort to the use of destructive fishing methods to sustain their level of livelihood and food requirements. A case in point is exemplified by the use of poison, which led to a ban on fishing and the export of fish in March 1999 (Ntiba *et al*, 2001), was probably largely due to rent-seekers.

The study results indicated that searches for immature fish, illegal nets/gears were not common on landing sites and, that mono-filament gillnets were widely used for fishing on Lake Victoria. However, during the study, enforcement of several provisions of the Fish Act were observed; namely; confiscating of under size gill nets and arresting of culprits by the police officers, destruction of immature fish confiscated from fishermen, destruction of scoop nets by DFR staff and destruction of illegal under-sized boats. The information above therefore, indicates that the

DFR together with local governments and BMUs have put considerable effort to enforce the Fish Act regulations.

The study examined the relationship between implementation and enforcement of the Fish Act on Lake Victoria (Uganda). The study revealed that there was a significant negative relationship between implementation of the Fish Act and enforcement of the Fish Act. This suggests that effective implementation of the Fish Act reduces enforcement activities for compliance with the Fish Act. Besides, when the whole fishing community understands the Laws/regulations, compliance level is expected to go up.

The study also revealed that implementation of the Fish Act had a negative relationship with the level of fish malpractices on Lake Victoria ($r = 0.152$; $p < 0.05$). In other words, the level of fish malpractices and resource destruction had continued despite implementation of the Fish Act. This observation was supported by one fish processor[2] and exporter that: "*These days, fisheries resources in Lake Victoria have reduced due to increased exploitation. With the scramble for the finite fisheries resources between factories, regional traders and domestic consumers; illicit trade of immature fish has increased.*"

The increase in fishing malpractices was attributed to the increased competition for fisheries resources had accelerated mal-fishing practices and consequently, resource destruction. This is consistent with the National Report of the Fisheries Frame Survey (2006) that apparently illegal fishing and mal fishing practices on Ugandan Lakes especially Lake Victoria has increased. MAAIF (2003) pointed out that fish stocks of important commercial species had declined and that uncontrolled access and increased population exerted tremendous pressure on the resource in

[2] NGE-GE Limited Fish Processors and Exporters

the absence of effective Government oversight. Increased denial of licenses and fishing permits by DFR, increased awareness about conserving fisheries resources, and encouragement of fish farming were among the reasons advanced by the fisher folk to support the view that the Fish Act if revised and implemented effectively would ensure sustainable exploitation of fisheries resources.

5.2 Conclusions

1. Implementation and enforcement of the Fish Act on Lake Victoria is inadequate to ensure sustainable exploitation and conservation of fisheries resources.
2. There are several fishing practices that breach the Fish Act including use of undersize gill nets, fish poisoning, catching immature fish, fishing in breeding grounds, lack of fish movement permits and landing at non- designated landing sites among others were used on Lake Victoria.
3. Despite sensitization and training of the fisher folk and managers, illegal fishing practices are still observed on Lake Victoria There is an inverse relationship between implementation of the Fish Act with fish malpractices and resource destruction on Lake Victoria.

5.3 Recommendations

In order to improve implementation and enforcement of the Fish Act to enable it to effectively control the exploitation and conservation of fisheries resources on Lake Victoria (Uganda), the following measures are recommended:

1. All Laws including the Fish Act are dynamic depending on emerging issues. The Fish Act is outdated. As such, there is need to review the Law periodically to address the going concerns that emerge from time to time.

2. The fisheries Subsidiary Instruments that are inconsistent with the Fish Act like the Beach Management Unit Instrument (2003), The Fish (Immature Fish) Instrument No. 73 of 2002, the Statutory Instrument No. 73 of 2001, should be formalized to enable the effective enforcement and avoidance of legal proceedings against the Department of Fisheries Resources. This should be in addition to having change in fisheries enforcement approach.

3. There is urgent need for increased staff levels for implementation and enforcement of the fisheries law, and to develop human resources capacity in fisheries management, monitoring, controlling and surveillance, and that of other stakeholders to support government efforts. There is need to increase the capacity of the Department of Fisheries Resources in enforcement and prosecution of illegal, unregulated and unreported fishing and illicit trade in immature fish coupled with acquisition of equipment like patrol vehicles and communication gadgets needed for efficient enforcement of regulations in the Fish Act.

4. In order to reduce fishing pressure on Lake Victoria, there is need for getting fishermen out of the waters through a buyout system and there after sensitizing and retraining them to engage in downstream fishing activities such as processing and trading, and provision of supplies for fishing. In addition, the government should prioritize retraining of fishermen into alternative livelihoods such as fish farming, cage culture, boat making to enable them sustain their livelihoods.

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APPENDIX 1

INTERVIEW GUIDE FOR THE FISHERFOLK IN FISHING VILLAGES

TOPIC: Analysis of the Implementation and Enforcement of The Fish Act in Uganda

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SECTION A: BACKGROUND INFORMATION OF RESPONDENTS

(Tick the correct alternative or write your response in the space provided)

Number of respondent_____

A1. Name of respondent (Optional) _____

A2. District name_____

A3. BMU name _____

A4. Name of Fish Landing Site/Fishing Village where you operate from_____

A5. Sex of the respondent

1. Male ☐
2. Female ☐

A6. What is your age category? *(Please tick in the box below your answer)*

Below 20 years	20-25yrs	26-30yrs	31-35yrs	36-40yrs	Above 40yrs

A7. Highest education level attained *(Please tick under only one of them).*

No formal education	Primary Level	Secondary	Diploma	Degree	Post graduate

A8. What is your other occupation apart from fishing? *(Please tick in the box below your answer).*

Civil servant	Farmer	LC official	Trader	Student	Unemployed

A9. Marital status:

Single

Married ☐

Widow/widower ☐

Divorced/separated ☐

Others specify _____

SECTION B: FACTORS THAT AFFECT IMPLEMENTATION OF THE FISH ACT IN UGANDA

B1. Have you heard about the existence of the Fish Act (cap. 197)?

Yes ☐

No ☐

B2. Have you ever been sensitized about compliance with the Fish Act?

Yes ☐

No ☐

B3. Which of the following institutions/officials have you interacted with in relation to implementation of fishing regulations? *(you may tick more than one option)*

Directorate of Fisheries Resources ☐

District Fisheries Officer ☐

Members of the BMUs. ☐

Law enforcement officers ☐

B4. This section contains various statements about implementation of the Fish Act in Uganda. Kindly express your opinion by ticking one of the given responses (*Strongly Agree, Agree, Undecided, Disagree and strongly disagree)* in front of each statement.

Statements	**Responses**				
	Strongly agree	**Agree**	**Undecided**	**Disagree**	**Strongly disagree**
1. I have been trained on how to comply with the Fish Act.					
2. Directorate of Fisheries Resources has carried out sensitization meetings with the fisherfolk on how to comply with fishing regulations					

3. Our BMU has carried out sensitization meetings with the fisher folk on how to comply with fishing regulations					
4. Fishermen on this landing site use the recommended fishing gear.					
5. Demonstration of appropriate fish gears and fishing methods have been frequently done to fishermen on this landing site					
6. Implementation of the Fish Act has been efficient at reducing fish malpractices					
7. The mass media is used to mobilize the fisher folk against fish malpractices.					

B5. Do you think the Fish Act is adequate to ensure sustainable exploitation and conservation of fisheries resources in Uganda?

Yes ☐

No ☐

B6. Do you think implementation of the Fish Act by the government has been adequate to ensure sustainable exploitation and conservation of fisheries resources in Uganda?

Yes ☐

No ☐

B7. Which of the following factors have hindered efficient implementation of the Fish Act in Uganda? *(you may tick more than one factor)*

Inadequate funds ☐

Shortage of equipment, ☐

Shortage of personnel, ☐

Limited awareness, ☐

Limited support by stakeholders ☐

Any other_____

_____

_____

SECTION C: FACTORS THAT AFFECT ENFORCEMENT OF THE FISH ACT

C1. Do you think the Fish Act of Uganda is adequately enforced in this area?

Yes ☐

No ☐

C2. This section contains various statements about enforcement of the Fish Act in Uganda. Kindly express your opinion by ticking one of the given responses (*Strongly Agree, Agree, Undecided, Disagree and strongly disagree)* in front of each statement.

Statements	**Responses**				
	Strongly agree	**Agree**	**Undecided**	**Disagree**	**Strongly disagree**
1. Ensuring compliance to fisheries laws and regulations remains a challenge in this area					
2. Several fishermen with illegal fishing gear have been arrested on this landing site					
3. Fishermen who land undersize fish have been arrested on this landing site					
4. Mono-filament gillnets are no longer used for fishing on lake Victoria					
5. Fishermen on this landing site use the recommended fishing gear.					
6. There are weak institutions and institutional processes for Monitoring Control and Surveillance on Lake Victoria					
7. There has been destruction of illegal gears/items, undersize fish by law enforcement personnel on this landing site					
8. Controlling the use of destructive and illegal fishing gears and methods have remained a challenge on L. Victoria					
9. Controlling capture and trade in immature fish is still a problem on L. Victoria					
10. Fishermen who use illegal fishing methods are prosecuted.					
11. Searches for immature fish, illegal nets/gears are common on this landing site.					
12. There is an efficient water patrol system on the waters of Lake Victoria					
13. Illegal fishing equipment is usually seized on this landing site					

C3. Which of the following factors are challenges to Fish Act enforcement activities in Uganda? *(you may tick more than one factor)*

Inadequate funds ☐
Poor information exchange mechanisms, ☐
Shortage of personnel, ☐
Compromise by some law enforcers, ☐
Limited support by stakeholders ☐
Any other_____

_____

_____

SECTION D: **THE EFFECT OF THE FISH ACT ON EXPLOITATION AND CONSERVATION OF FISHERIES RESOURCES**

D1. Do you think the Fish Act has had an effect on exploitation of fisheries resources on L. Victoria?

Yes ☐
No ☐

D2. What has been the effect of the Fish Act on exploitation of fisheries resources?

Increased exploitation of fisheries resources ☐
Reduced exploitation of fisheries resources ☐
No effect ☐

D3. What are other effects of the Fish Act on exploitation of fisheries resources?

_____

_____

_____

D4. Do you think the Fish Act has had an effect on Conservation of fisheries resources on L. Victoria?

Yes ☐
No ☐

D5. What has been the effect of the Fish Act on Conservation of fisheries resources?

Increased conservation of fisheries resources ☐

Reduced conservation of fisheries resources

No effect ☐

D6. What are other effects of the Fish Act on conservation of fisheries resources?

_____

_____

_____

_____

D7. What strategies do you recommend for improvement in:

a) Implementation of the Fish Act

_____

_____

_____

b) Enforcement of the Fish Act

_____

_____

_____

c) Conservation of fisheries resources

_____

_____

_____

End

Thanks for your cooperation

APPENDIX II

INTERVIEW GUIDE FOR KEY INFORMANTS

Title of the Key informant _____

1. What preparations have been put in place by the government to ensure effective implementation of the Fish Act?
2. What preparations have been put in place by the BMUs to ensure effective implementation of the Fish Act?
3. What are the factors that affect implementation of the Fish Act on Lake Victoria?
4. What is the relationship between implementation and enforcement of the Fish Act?
5. Do you think the Fish Act is adequate to ensure sustainable exploitation and conservation of fisheries resources in Uganda?
6. How has the Fish Act affected exploitation of fisheries resources on Lake Victoria in Uganda?
7. How has the Fish Act affected conservation of fisheries resources on Lake Victoria in Uganda?
8. What strategies can be implemented to improve implementation of the Fish Act?
9. What strategies can be implemented to improve enforcement of the Fish Act?

APPENDIX III

QUESTIONNAIRE FOR LAW ENFORCEMENT OFFICERS

TOPIC: Analysis of the Implementation and Enforcement of The Fish Act in Uganda

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SECTION A: BACKGROUND INFORMATION OF RESPONDENTS

(Tick the correct alternative or write your response in the space provided)

Number of respondent_____

Name of respondent (Optional)_____

A1. Sex of the respondent

1. Male ☐
2. Female ☐

A2. What is your age category? *(Please tick in the box below your answer)*

Below 20 years	20-25yrs	26-30yrs	31-35yrs	36-40yrs	Above 40yrs

A4. Highest education level attained *(Please tick under only one of them).*

No formal education	Primary Level	Secondary	Diploma	Degree	Post graduate

A5. Marital status:

Single ☐

Married ☐

Widow/widower ☐

Divorced/separated ☐

Others specify _____

SECTION B: FACTORS THAT AFFECT IMPLEMENTATION OF THE FISH ACT IN UGANDA

B1. Have you ever been trained on how to enforce laws and regulations in the Fish Act?

Yes ☐

No ☐

B2. Which of the following institutions/officials have been useful in enforcement of the Fish Act? *(you may tick more than one option)*

Directorate of Fisheries Resources ☐

District Fisheries Officers ☐

BMUs. ☐

Police ☐

B3. Do you think the Fish Act has been adequate to ensure sustainable exploitation and conservation of fisheries resources in Uganda?

Yes ☐

No ☐

B4. Do you think implementation of the Fish Act by the government has been adequate to ensure sustainable exploitation and conservation of fisheries resources in Uganda?

Yes ☐

No ☐

B5. Which of the following factors have hindered efficient implementation of the Fish Act in Uganda? *(you may tick more than one factor)*

Inadequate funds ☐

Shortage of equipment, ☐

Shortage of personnel, ☐

Limited awareness, ☐

Limited support by stakeholders ☐

Any other_____

_____

_____

SECTION C: ENFORCEMENT OF THE FISH ACT

C1. Do you think the Fish Act of Uganda is adequately enforced?

Yes ☐

No ☐

C2. What are the common areas/activities breached by fishermen?

_____

_____

_____

C3. This section contains various statements about enforcement of the Fish Act in Uganda. Kindly express your opinion by ticking one of the given responses (*Strongly Agree, Agree, Undecided, Disagree and strongly disagree)* in front of each statement.

Statements	**Responses**				
	Strongly agree	**Agree**	**Undecided**	**Disagree**	**Strongly disagree**
1. Ensuring compliance to the Fish Act remains a challenge on lake Victoria					
2. Several fishermen with illegal fishing gear have been arrested on landing sites					
3. Fishermen who land undersize fish have been arrested on landing sites					
4. Mono-filament gillnets are no longer used for fishing on lake Victoria					
5. Fishermen on landing sites use the recommended fishing gear.					
6. There are weak institutions and institutional processes for Monitoring, Control and Surveillance on Lake Victoria					
7. There has been destruction of illegal gears/items, undersize fish by law enforcement personnel on landing sites					
8. Controlling the use of destructive and illegal fishing gears and methods have remained a challenge on L. Victoria					
9. Controlling capture and trade in immature fish is still a problem on L. Victoria					
10. Fishermen who use illegal fishing methods have been prosecuted.					
11. Law enforcement officers search for immature fish, illegal nets/gears on landing sites.					

12. There is an efficient water patrol system on the waters of Lake Victoria					
13. Illegal fishing equipment is usually seized on landing sites					

C4. Which of the following factors are challenges to the Fish Act enforcement activities in Uganda? *(You may tick more than one factor)*

Inadequate funds ☐
Poor information exchange mechanisms, ☐
Shortage of personnel, ☐
Compromise by some law enforcers, ☐
Limited support by stakeholders ☐
Any other_____

_____

_____

SECTION D: **THE EFFECT OF THE FISH ACT ON EXPLOITATION AND CONSERVATION OF FISHERIES RESOURCES**

D1. Do you think the Fish Act has had an effect on exploitation of fisheries resources on L. Victoria?

Yes ☐
No ☐

D2. What has been the effect of the Fish Act on exploitation of fisheries resources?

Increased exploitation of fisheries resources ☐
Reduced exploitation of fisheries resources ☐
No effect ☐

D3. What are other effects of the Fish Act on exploitation of fisheries resources?

_____

_____

_____

_____

D4. Do you think the Fish Act has had an effect on Conservation of fisheries resources on L. Victoria?

Yes ☐

No ☐

D5. What has been the effect of the Fish Act on Conservation of fisheries resources?

Increased conservation of fisheries resources ☐

Reduced conservation of fisheries resources ☐

No effect ☐

D6. What are other effects of the Fish Act on conservation of fisheries resources?

_____

_____

_____

_____

D7. What strategies do you recommend for improvement in:

d) Implementation of the Fish Act

_____

_____

_____

e) Enforcement of the Fish Act

_____

_____

_____

f) Conservation of fisheries resources

_____

_____

_____

End

Thanks for your cooperation

APPENDIX IV

OBSERVATION CHECKLIST OF IMPLEMENTATION, ENFORCEMENT AND COMPLIANCE ACTIVITIES OF THE FISH ACT ON L.VICTORIA FISHERY

TOPIC: Analysis of the Implementation and Enforcement of The Fish Act in Uganda

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Name of district_____

Name of the landing site/fishing village observed_____

Activity observed	Findings
1. Prohibited fishing gears	
2. Number of convictions	
3. Illegal gear confiscated	
4.Common areas of breach of the Fish Act	
5.Sensitization meeting/minutes of such meetings	
6.Immature fish captured by fishermen/law enforcement officers	
7.Destruction of prohibited fishing gear	
8. Law enforcement patrol activities	
9. Suspects arrested	