RESEARCH REPORT 9

Governance of Africa's Resources Programme

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'Troubled Waters' Sustaining Uganda's Lake Victoria Nile Perch Fishery

Alex Benkenstein

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ABBREVIATIONS AND ACRONYMS

AFALU	Association of Fishers and Lake Users (of Uganda)
BMU	Beach Management Unit
CPUE	catch per unit effort
DFO	District Fisheries Officer
DFR	Directorate of Fisheries Resources
DRC	Democratic Republic of Congo
EAIFFPA	East Africa Industrial Fishing and Fish Processors Association
FMP	Fishery Management Plan
FMP1	Fisheries Management Plan for Lake Victoria (2001)
FMP2	Fisheries Management Plan for Lake Victoria, 2009–2014
IFMP	Implementation of a Fisheries Management Plan Project
LVFO	Lake Victoria Fisheries Organization
LVFRP	Lake Victoria Fisheries Research Project
MCS	monitoring, control and surveillance
MSY	maximum sustainable yield
mt	metric tonne
NaFIRRI	National Fisheries Resources Research Institute
UFA	Uganda Fisheries Authority
UFPEA	Uganda Fish Processors and Exporters Association

EXECUTIVE SUMMARY

Lake Victoria supports one of the largest freshwater fisheries in the world. It is a critical source of food and income for the countries bordering the lake: Uganda, Kenya and Tanzania. However, like so many fisheries, the sustainability of this resource is threatened by poor governance, a rapid increase in fishing pressure and widespread illegal practices. This study focuses on Uganda's Lake Victoria Nile perch fishery. Nile perch is a high-value species that dominates Uganda's fish exports, which are the country's second largest foreign-exchange earner after coffee.

There have been some significant achievements in moving towards an effective governance system for Lake Victoria's fisheries. On the regional level, the three states sharing the lake's resources have formed the Lake Victoria Fisheries Organization (LVFO), an important platform for co-operation, which has contributed to harmonising policies and standardising stock assessment methods. The past decade has also seen the implementation of a co-management system through a network of more than a thousand community-level Beach Management Units (BMUs). However, despite these achievements, Lake Victoria's fisheries continue to face serious challenges. The profits of the Nile perch export trade have lured growing numbers of fishers, boat owners and traders into the sector. As overfishing dramatically reduces the number of adult Nile perch, fishermen increasingly resort to using illegal fishing gears and capturing immature fish in order to maintain catches. When, in an effort to preserve stocks, the factories processing fish for export stopped accepting immature Nile perch, fishers and traders simply diverted the illegal catches to local and regional markets, particularly the Democratic Republic of Congo (DRC). This regional trade in immature Nile perch, linked with the proliferation of illegal fishing gears, has now become the primary threat to the continuing sustainability of Uganda's Nile perch fishery.

A significant gap exists between the policies and strategies outlined in LVFO documents and the reality on the ground within the partner states responsible for implementing these policies. In Uganda, key legislation aimed at addressing some of the governance challenges of fisheries has been stalled for over half a decade. Communication and co-operation are weak among the Directorate of Fisheries Resources (DFR), local government fisheries officers and the BMUs. Although funding is a major constraint at national, district and community levels, Uganda has not followed Tanzania's example of charging a levy on Nile perch exports. The licensing system for fishers and boats, which was an important source of income in the past, is currently in disarray. The DFR argues that it does not receive sufficient funds from central government budget allocations. However, the institution's economic troubles are clearly in part self-afflicted, to the extent that foreign donors, which have played a central role in supporting fisheries governance in Uganda, are becoming increasingly sceptical of the Directorate's effectiveness. The Minister of State for Fisheries, Ruth Nankabirwa, has claimed that Uganda loses $250 million through illegal fishing and $70 million in fisheries tax evasion every year.[1]

Fisheries governance challenges must also be seen within the context of broader ecosystem and societal trends. Eutrophication and pollution in Lake Victoria are becoming increasingly urgent problems, caused in part by poor waste management practices and

run-off from fertilised agricultural land. Furthermore, Uganda has one of the highest rates of population growth in the world, which increases pressure on available resources, drives food price inflation and may threaten food security, particularly in marginalised communities.

Despite this somewhat bleak picture, Uganda's fisheries, and its Lake Victoria Nile perch fishery in particular, are not in a hopeless position. Nile perch are a resilient and fecund species, which can respond well to improved governance. A relatively complex, multi-level institutional structure is in place to govern fisheries in Uganda, and the system of BMUs plays a critical role in enabling fishers and other members of the sector to contribute to fisheries governance. However, this institutional structure is not currently functioning effectively, nor have systems been put in place to ensure sustainable financing.

It is essential that the Fisheries Bill, which has existed in draft format since at least 2005, be passed into law. The Minister of State for Fisheries, senior DFR officials and parliament need to identify and address the reasons for the delay in passing this important legislation. Although a critical step in improving fisheries governance in Uganda, the passing of the Fisheries Bill will only lay the foundation for addressing many of the problems outlined in this report, including poor co-operation and communication, corruption, inefficiency and capacity constraints. BMUs also confront problems of corruption, poor financing and weak capacity, but national and local government fisheries officers will never have the capacity or resources to replace this extensive, community-based system. It is therefore essential that national and local government fisheries officers act to strengthen BMUs rather than to circumvent them, as appears to be the current tendency. At the same time, the trade in immature Nile perch needs to be dealt with urgently, both at the capture phase and at markets and transport routes, such as those leading from Lake Victoria to the DRC.

The concluding chapter makes seven recommendations aimed at key actors in the fisheries sector. Many of these recommendations require co-operation between agencies, for example the Minister of State for Fisheries, senior DFR officials and parliament should initiate a dialogue in order to conclude and enact the draft Fisheries Bill and debate the establishment of the National Fisheries Authority. Similarly, co-operation is required between the National Fisheries Resources Research Institute, DFR and the LVFO in developing a national *State of Our Fisheries* report, aimed at bringing together key data, targets and strategies in a single document. Currently much of this information is distributed across a number of reports, and in many cases relate to Lake Victoria as a whole rather than providing country-specific information. The recommendations also address issues such as parliamentary oversight of fisheries governance, co-operation with law enforcement and judicial agencies to improve prosecution procedures, and the need to develop sustainable financing models at national and local levels of fisheries governance.

CHAPTER 1

INTRODUCTION

On the shore of Lake Victoria, just a short drive from Uganda's capital Kampala, wooden fishing boats are offloading their catch, some of which is immediately fried in the adjoining market amid displays of cassava, plantain and other local staples. Most of the fish are tilapia and Nile perch, but catfish and eerie lungfish are also available. Traders vie loudly for the day's catch, waving fistfuls of cash at the auctioneers. It is a reassuringly timeless scene, save for some obvious modern details such as outboard motors on some of the boats.

But things are not as they appear. The Nile perch being carried from the boats are not part of a timeless fishing tradition in Uganda – the species was introduced into Lake Victoria in the 1950s, and significant catches were only recorded in the 1980s. Nor is the Nile perch for local or regional consumption. Instead the fish will be loaded onto cold-storage trucks and transported to nearby fish-processing factories. From there the processed fish will be flown to global markets, mostly in Europe, which consumes about 80% of Uganda's Nile perch catch. The final consumers of the Nile perch carried from the fishing boats are more likely to be patrons of a French restaurant or a Spanish supermarket than a local Ugandan family. The revenues generated by these exports support the livelihoods of fishers, factory workers and many other actors along the value chain, but overfishing and poor governance are threatening this important resource. In recent years, Nile perch exports have declined significantly, as fishing pressure and the use of illegal fishing gears have increased, while large numbers of immature Nile perch are traded locally or exported to regional markets.

Lake Victoria is the world's second largest freshwater body by surface area. The lake supports fishing activity of great social and economic significance to the three countries that share the lake, namely Uganda (controlling 43% of the lake by area), Tanzania (51%) and Kenya (6%). These countries have formed the LVFO in order to co-ordinate policies, standardise data-gathering processes and share information related to the lake's fisheries. Although the LVFO represents an important platform for co-operation among the partner states, the responsibility for the management of the fisheries remains with the relevant national authorities of each state. Indeed, it is at the national, local government and community levels that fisheries governance continues to face significant challenges.

As a poor but growing economy, Uganda relies on its water resources and fertile soil to support economic growth – over 95% of Uganda's exports are primary agricultural commodities such as coffee, fish, cotton and tea, and about 75% of Uganda's working population is employed in the agricultural sector. Fish products are Uganda's second most important export after coffee, and play a critical role in providing employment, generating export revenues and supporting food security in the region. Lake Victoria accounts for about half of Uganda's annual fish catch and is the primary source of Nile perch exports.[2]

The aim of this study is to investigate factors that are contributing to the decline of the fishery and identify ways to improve the governance of this resource in Lake Victoria. The findings of the report are based on field research conducted in Jinja and Kampala in

November 2010 and March/April 2011, as well as a review of relevant policies, legislation and published literature. Semi-structured interviews were conducted with various stakeholders, including officials at the LVFO and the DFR, researchers at the National Fisheries Resources Research Institute (NaFIRRI), fish factory owners, members of civil society and representatives of BMUs.

Although a great deal of research has been published on Lake Victoria's Nile perch fishery, relatively few research projects focus on multi-level governance issues in relation to a specific national context. This report highlights the discrepancies between the regional governance discourse and the complex national environment where regional policies, if they are to achieve tangible results, must be implemented. These discrepancies are echoed in the relationship between the national fisheries authority and local-level actors such as BMUs and local government fisheries officers. In the course of fieldwork conducted for this report an interviewee observed that 'behind the official fabric of policies and such, there is a very different reality on the ground'. It is this gap between policy and implementation that obscures the pragmatic actions required to manage the Nile perch fishery.

Over the past decade a co-management system has been put in place, fish processing factories have instituted self-policing, and a number of management plans and strategies, including a regional 'Operation Save Nile Perch', have been declared. Yet Nile perch catches, and particularly catch per unit effort (CPUE), have continued to decline. This report suggests that governance efforts have struggled because of an inability to develop pragmatic solutions to a few key challenges, including sustainable financing systems for fisheries governance, the failure to address the regional trade in immature Nile perch, corruption at various levels, stalled fisheries legislation, and poor co-operation between national and local actors in addressing the use of illegal fishing gears. These observations do not suggest that existing systems, such as BMUs, should be discarded; indeed, efforts should be made to strengthen these systems to ensure that they play their intended role in contributing to a sustainable Nile perch fishery. In recent years there has been much speculation about the positive role that Uganda's oil reserves can play in the economic development of the country, yet fisheries will remain a critical sector in terms of providing employment and supporting livelihoods across a broad sector of the Ugandan economy.

This study recognises the impact of broader socio-economic and environmental factors in the management of the fishery. For example, the enforcement of fishing regulations is constrained by a lack of financial resources as well as the size of the surveillance area. Moreover, management efforts aimed at encouraging employment and increased exports must consider food-security issues as well as the biological constraints of the fishery itself.

Uganda's Nile perch fishery involves a number of actors, national legislation and regional policies. A case-study approach assists in understanding how these forces play out in the day-to-day practices of Uganda's fishing community. For this reason, the second part of this report focuses on fisheries practices observed in the town of Jinja and selected BMUs in the area. Jinja is a suitable case-study area for several reasons, including the fact that it is the historical centre of Uganda's fisheries industry where the fish-processing facilities that prepare Nile perch products for export to international markets are concentrated. Furthermore, both the LVFO and NaFIRRI are headquartered in Jinja.

The concluding chapter presents a number of recommendations aimed at improving the governance of Uganda's fisheries, and its Lake Victoria Nile perch fishery in particular.

Figure 1: Map of Uganda and neighbouring countries

Source: Adapted from the United Nations, Department of Public Information Cartographic Section, Map of Uganda, Map 3862, revision 4, May 2003

CHAPTER 2

OVERVIEW OF UGANDA'S NILE PERCH FISHERY

After being introduced into Lake Victoria in 1954, Nile perch took some time to become established, but by the 1980s their population levels had increased dramatically. Between 1975 and 1990, annual catches of Nile perch increased more than ten-fold, growing from 335 metric tonnes (mt) to over 380 000 mt. As with many species introductions around the world, the establishment of Nile perch in Lake Victoria was to have a devastating ecological impact on the lake's endemic species. Nile perch are large, aggressive predators, which have significantly reduced the previously dominant *Haplochromis*, an endemic species of small fish, and driven an estimated 200 endemic fish species to extinction.[3]

Other important ecological changes in the past decades include the proliferation of Nile tilapia, also an introduced fish species, which crowded out many of Lake Victoria's indigenous tilapia species. Tilapia catches from Lake Victoria rose from about 13 000 mt in 1975, to around 105 000 mt in 2000. The decimation of *Haplochromis* by Nile perch also led to a significant increase in the population of the endemic anchovy-like species, *Rastraineobola argentea* (known locally as dagaa or mokene), which competed with *Haplochromis* for food sources but was itself not a key prey species of Nile perch.

In effect, between 1970 and 2000, Lake Victoria's biomass drastically changed from indigenous, less economically important fish species to just three dominant species: Nile perch, Nile tilapia and dagaa.

VALUE CHAINS AND MARKETS

The capture phase

In Uganda, Nile perch and tilapia are captured using broadly similar fishing practices, but are processed and traded differently. Fishing is conducted by small wooden craft powered by paddle or an outboard motor, usually holding a crew of two individuals. A third party typically owns the boats and fishing gear and employs the fishers. These boat owners may own anything from two to over 40 boats. The distinction between boat owners and fishers is important in certain respects. For example, fishers detained with illegal nets may have their nets destroyed but are not usually prosecuted, as they do not own the nets. Furthermore, boat owners involved in illegal activities are rarely prosecuted, as the ownership of these fishing companies is often opaque and boat registration procedures have fallen into disuse.

The most common fishing gears for Nile perch are gill nets, which are required by law to have a mesh size no smaller than five inches and must be constructed from twine rather than monofilament. The use of monofilament and small-mesh gill nets are the most

common form of illegal fishing activity, as these nets are cheaper, less visible to fish and able to target the more abundant immature fish. In order to prevent the capture of Nile perch before they reach breeding age, the capture or trade of Nile perch less than 50 cm in length has been prohibited. A further illegal practice related to gill nets, which is becoming increasingly common as Nile perch numbers decline, is the practice of combining two or three gill nets vertically, allowing the fishers to target a greater share of the water column.

Hand-line and long-line fishers also target Nile perch. In this case, the size of the hook is regulated to prevent small perch from being caught. Although legal for fishing Nile perch, these methods have been questioned because they allow fishers to catch very large Nile perch, which are an important part of the breeding population. Other forms of fishing gear used on the lake are monofilament cast nets and beach seines. These gears are illegal but are frequently used.

Fishers releasing a long line from a typical paddle canoe

A monofilament cast net, illegal yet commonly used

Fishers gathering in a gill net; this boat is powered by an outboard engine

Processing and trade

Much of Lake Victoria's Nile perch is caught on the lake's islands and other geographically dispersed locations. Rather than travel the significant distances to the nearest fish-processing facility, fishers sell their catch to fish traders in larger vessels that are able to transport up to five tonnes of fish in their holds. These fish traders transport the catch to landing sites on the mainland, where it is sold to factory agents or other fish traders.[4]

Nile perch produces high-value, white fish fillets, which have a ready market in the EU, Middle East, Australia and the US. As Nile perch populations rapidly increased in the lake, industrial fish processors were established on the lake shore to take advantage of the demand for quality white fish in global markets. A study conducted in 2008 identified 10 fish-processing factories in Uganda, six in Kenya and nine in Tanzania.[5] The most valuable products are fresh and frozen fish fillets, for which Europe is the primary market. Various other products of lesser value are produced to derive maximum value from the fish: fish bladders are exported to Asia; fish skins are used as fertiliser or in some cases converted to leather; and fish frames (heads and bones) are exported or sold for local consumption.

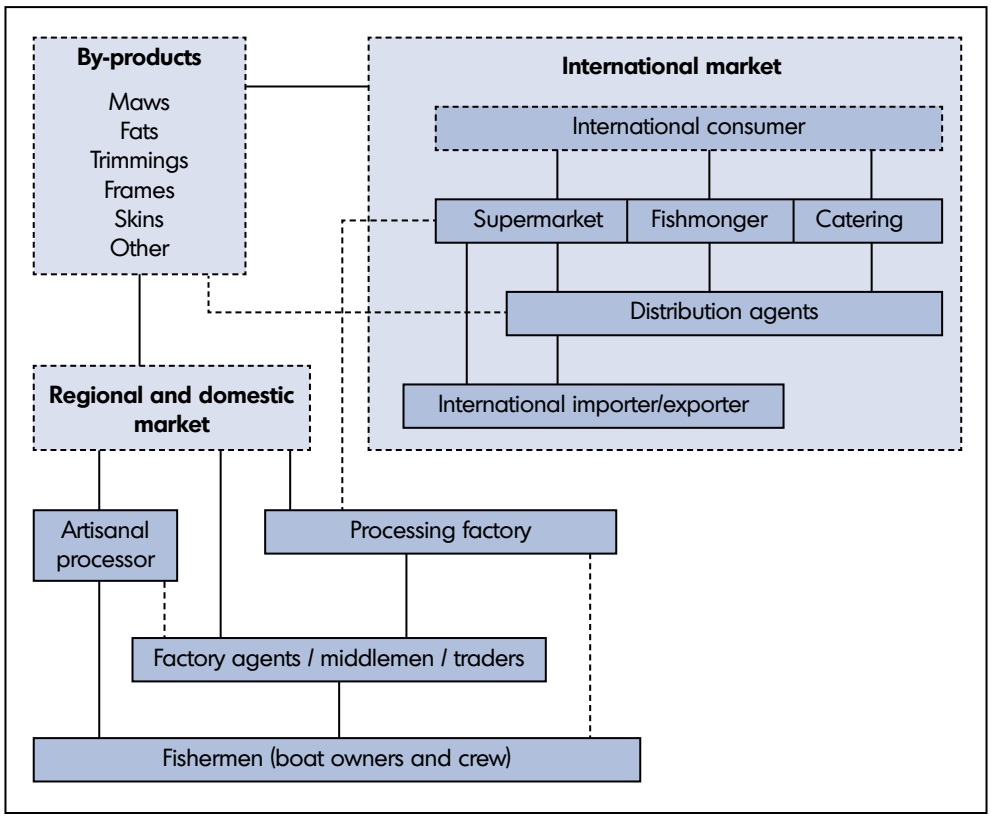
Almost all legal-size Nile perch is processed for export, while tilapia and dagaa are either consumed locally or exported to regional markets such as Kenya, South Sudan and eastern DRC. These regional markets have also become the primary destinations for the trade in illegally caught immature Nile perch. In 2003, during operations conducted by the DFR, numerous trucks transporting immature Nile perch from Lake Victoria to the DRC were identified; it was estimated that every week about 10 trucks each transporting an average of 10 tonnes of immature Nile perch take this route.[6] Anecdotal evidence suggests that this regional trade has increased significantly since the effective implementation of

self-policing by the industrial fish-processing facilities around Lake Victoria in 2007. Therefore, controlling the regional trade in illegal immature Nile perch has become one of the key challenges in ensuring the sustainability of Lake Victoria's Nile perch stocks.

Above: Fish are offloaded from the larger transport boats, which have brought Nile perch from remote fishing grounds directly to a fish-processing facility near Jinja

Left: Nile perch being weighed at a landing site. From here the fish will be transported by cold storage trucks to a nearby fish-processing facility

Figure 2: Nile perch value chain



Source: Pollard I, 2008, *Implementation of a Fisheries Management Plan for Lake Victoria*. Jinja: LVFO, p. 18

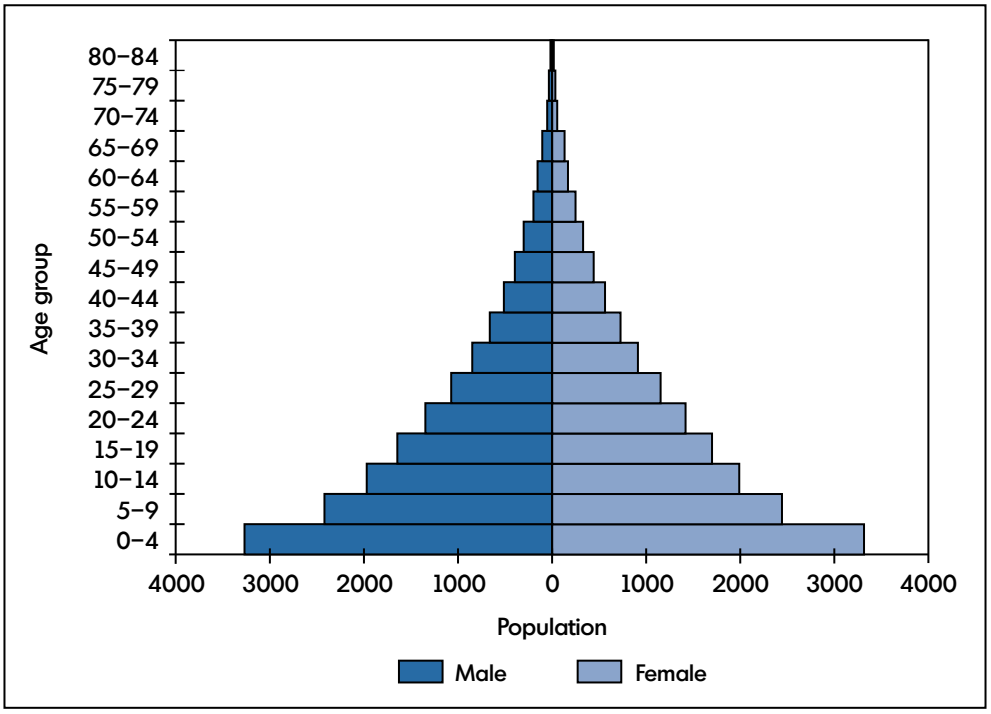
FISHERIES AS AN ECONOMIC RESOURCE AND FOOD SECURITY

Uganda is a poor but growing economy. Economic growth averaged over 7% between 2000 and 2010, and the country has already achieved the Millennium Development Goal of halving the proportion of people living in poverty (from 56% in 1992/93 to 25% in 2009/10).[7] Uganda weathered the global recession fairly well, growing by 5.8% in 2009/10, and the development of the country's oil reserves, estimated at two billion barrels, has raised prospects of significant growth in the future. Despite these positive developments, the country continues to face significant challenges. Uganda's economy is highly reliant on agriculture and natural resources, while 85% of Uganda's population live in rural areas, where poverty and a lack of access to basic services remain critical problems.[8]

An important feature of Uganda is its population, which is overwhelmingly young and one of the world's fastest growing, at a rate of 3.2%, adding a million people to its current population of 33 million every year. About half the population is currently under 18 years old, and the UN estimates that by 2030 Uganda's population will reach 80 million.[9] Uganda's population trends, its reliance on the agricultural and natural resource sectors, the low level of urbanisation and relatively strong economic growth will present significant challenges in the future, as the country balances economic and population growth with

the need to manage sustainably agricultural and natural resources. These challenges are already prevalent in the current high levels of deforestation and overfishing. Without effective governance of its natural resources, Uganda risks not only slower economic growth, but also political conflict and instability as competition for resources becomes ever more acute.

Figure 3: Uganda population pyramid, 2009



Source: Uganda Bureau of Statistics, *2009 Statistical Abstract*. Kampala: Uganda Bureau of Statistics, 2009

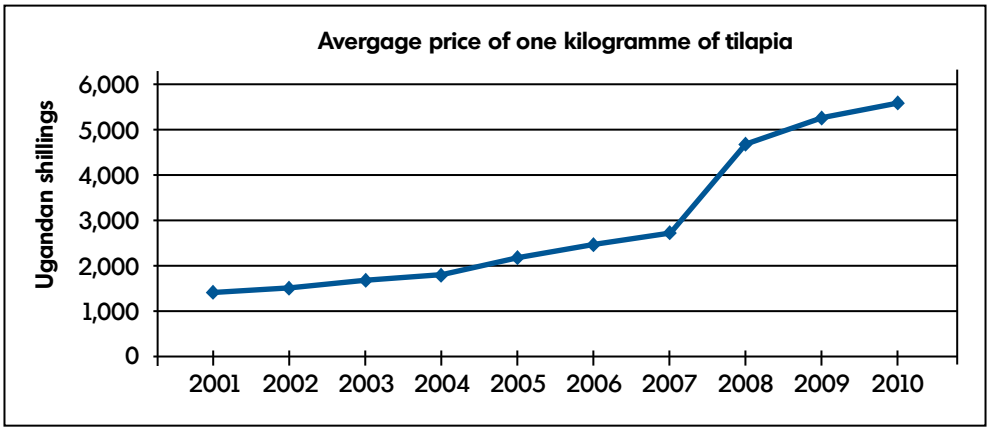
The benefits of Lake Victoria's fisheries are significant. The UN's Food and Agricultural Organization estimates that the livelihoods of 700 000 Ugandans are related to fisheries. The industry employs directly approximately 150 000 people, with 550 000 people earning incomes through processing, trading and other related services.[10] As already stated, fish products (which are dominated in value terms by Nile perch) are Uganda's second most important foreign exchange earner, after coffee exports, contributing about 2.5% of gross domestic product according to the Uganda Bureau of Statistics. However, as Uganda's Poverty Eradication Action Plan points out, the country's national accounts do not capture the full economic contribution of fisheries, which is estimated to be about 6% of the national economy.[11]

When Uganda's fish exports were growing rapidly in the 1990s, concerns emerged that these exports may be contributing to food insecurity in the region.[12] Various studies have elaborated on this perspective, which was also raised in the documentary *Darwin's Nightmare*. Given Uganda's rapidly growing population and widespread poverty, it

is questionable whether the export of thousands of tonnes of Nile perch each year to consumers in developed countries is in the interest of the Ugandan people.

A study conducted in 2008 confirmed high rates of malnutrition in the shoreline communities of Lake Victoria, particularly among children.[13] However, the study found no evidence to suggest a direct link with the Nile perch exports, particularly given the growth of the sector and accompanying job and income creation, which are an important source of revenue for various actors along the value chain. Despite rising fish prices in recent years, driven as much by growing local and regional demand for tilapia as the global trade in Nile perch, low-income households have generally adapted by turning to cheaper species of fish, such as dagaa, or alternative sources of protein such as beans and groundnuts.

Figure 4: Average tilapia prices in Ugandan markets, 2001–2010



Source: Dickson M & G Macfayden, *Study on Promoting Commercial Aquaculture in Uganga,* consultant report to EU Delegation in Uganda, 2011, p. 34

The many reasons for poor malnutrition include poor sanitation and high rates of HIV/Aids and malaria. The cause probably lies not in the Nile perch trade but in the low status of women in these communities.[14] Women and children in lakeside communities are dependent on revenue from the fishery only indirectly and precariously through the men involved in the fishery. Therefore, the prohibition of Nile perch exports is likely to have a negative impact on these communities rather than solve malnutrition challenges in the region. Nevertheless, government efforts aimed at developing rural communities and empowering women must be strengthened, as these have an important impact on food security at the community and household level.

CURRENT STATUS OF THE NILE PERCH FISHERY

Since stocks were first introduced, the total biomass of Lake Victoria Nile perch has varied considerably. The trawl surveys initially used to estimate stocks were limited in their effectiveness, as periodic changes in the oxygen levels in the water column affected the vertical distribution of fish densities. However, far more accurate biomass estimates

have been made possible through the use of acoustic surveys during the Lake Victoria Fisheries Research Project (LVFRP) (1991–2000) and the Implementation of a Fisheries Management Plan Project (IFMP) (2005–2009). From February 2000 to August 2001, the mean Nile perch biomass was 1.12 million tonnes, but declined considerably in the following years, with a mean of 650 000 tonnes during August 2005–February 2007 and just 300 000 tonnes for the period August 2007–August 2009.

Various studies have estimated that the maximum sustainable yield (MSY)[15] for the Nile perch fishery in Lake Victoria is around 250 000–300 000 tonnes per year.[16] Based on these studies, the LVFO Stock Assessment Working Group has set a target MSY of 225 000 tonnes. In order to achieve sustainably a yield of this level, it is necessary to maintain a biomass of 750 000 tonnes.

The extent of overfishing and the status of Nile perch stocks can be assessed by combining the above figures with the results of the acoustic surveys. Up until at least 2001 the yield (amount of Nile perch caught) was below the MSY, showing that exploitation was at sustainable levels. In 2005 (when acoustic survey data again became available) the yield was almost 30% more than the MSY, indicating extensive overfishing. By this time the total Nile perch biomass had also fallen below the target of 750 000 tonnes, to 544 000 tonnes, and by 2008 had dropped to 300 000 tonnes.

The total Nile perch biomass represents two factors: the total number of fish and the average size of the fish. As the Nile Perch Management Plan notes, the decreasing trend in total biomass is due in large part to a reduction in the average maximum size of Nile perch, which fell from 51.5 cm (August 2005–February 2007) to 26.9 cm (August 2008–August 2009). Fish commonly adapt to extreme fishing pressure by reaching breeding age at a younger age, which has occurred in the Lake Victoria Nile perch population; females now reach maturity at 58 cm and males at 52.5 cm, compared to 93.3 cm and 62.2 cm previously.[17] However, despite these adaptations, acoustic and trawl survey data shows that in recent years a far larger proportion of the total Nile perch biomass are immature fish that have not reached breeding age.

The high proportion of immature fish in the Nile perch population has both negative and positive aspects. It shows that most Nile perch in Lake Victoria are being caught before they reach breeding age, which affects the ability of the Nile perch population to sustain itself. This also has negative consequences for fishers, who would receive greater returns for their efforts if fish were able to grow to a larger size. On the positive side, it shows that even under conditions of extreme fishing pressure, Nile perch recruitment is relatively high. In other words, even a relatively small amount of adult fish can produce sufficient eggs to restore the population in a relatively short period of time, if enough of these eggs are able to reach breeding age.

The fecundity of Nile perch means that the population is quite resilient. The Nile perch population of Lake Victoria is not about to collapse entirely. Rather, overfishing of Lake Victoria's Nile perch stocks should be viewed in terms of the socio-economic loss represented by a significantly reduced Nile perch stock. The total Nile perch biomass is currently less than half of what is considered healthy, representing a significant economic loss for all actors in the fisheries value chain, from local fishers and traders, to factory owners and their staff. It also represents a significant loss of tax revenue to the state and exacerbates problems of rural poverty and unemployment.

CHAPTER 3

FISHERIES MANAGEMENT

FISHERIES MANAGEMENT ACTORS

Fisheries management on Lake Victoria involves a wide range of stakeholders, institutions and policies. At a regional level, the LVFO serves as a platform for co-operation among the relevant national ministries of the partner states. In Uganda, the national authority responsible for fisheries management is the DFR, which is situated in the Ministry of Agriculture, Animal Industry and Fisheries. The LVFO also serves as a collaborative platform for the fisheries research institutes of the partner states, a role which is particularly important for harmonising stock assessment techniques and sharing research results. The relevant body in Uganda is NaFIRRI. In Kenya, the national fisheries authority is the Ministry of Fisheries Development and the research institute is the Kenya Marine and Fisheries Research Institute. In Tanzania, the relevant bodies are the Fisheries Division within the Ministry of Livestock Development and Fisheries and the Tanzania Fisheries Research Institute.

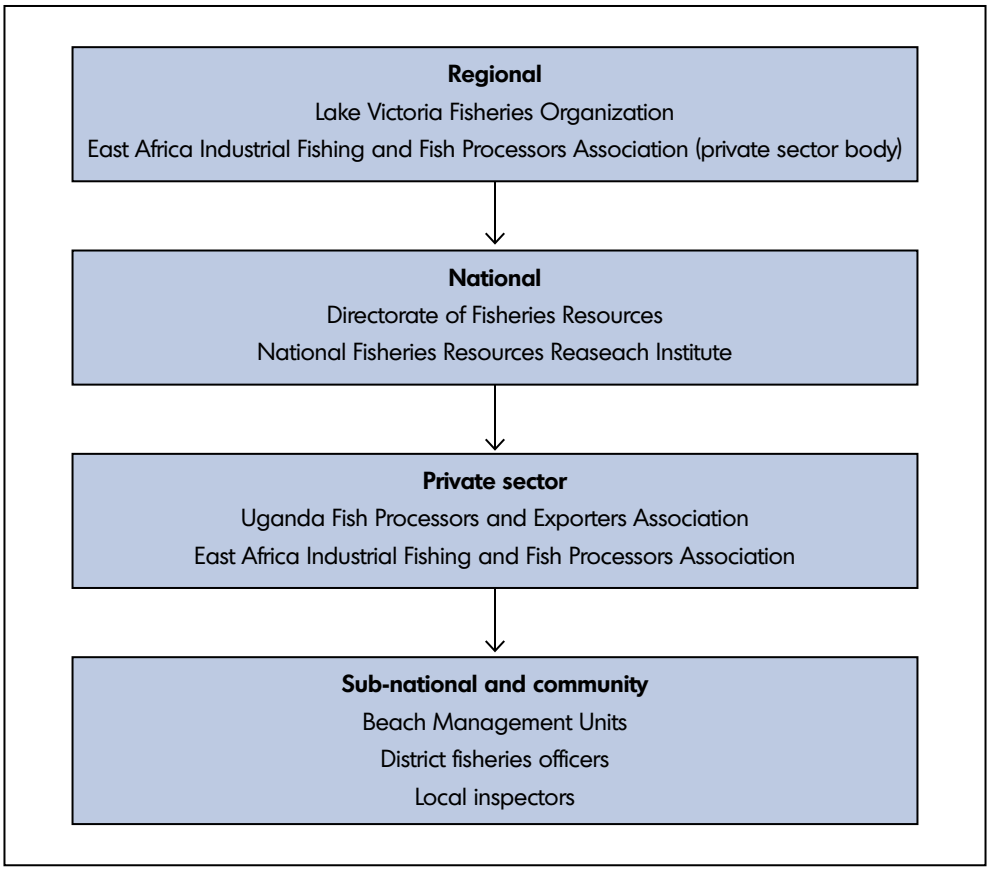
At local government level, district fisheries officers (DFOs) are responsible for fisheries management. However, DFOs are employees of the local government councils rather than the DFR, which has created accountability and communication challenges between the directorate and local government fisheries officers.

In the private sector, the industrial fish processors in Uganda have formed the Uganda Fish Processors and Exporters Association (UFPEA), which has partnered with its sister organisations in Kenya and Tanzania to form the East Africa Industrial Fishing and Fish Processors Association (EAIFFPA).

BMUs are community-based, legally recognised management organisations that are registered with the Fisheries departments of each partner state. All participants in fishery-related activities at local landing sites must be members of a BMU. Every BMU has an assembly of all registered members and an elected committee, headed by the BMU chairman. The LVFO has developed harmonised BMU guidelines, which set out standardised procedures for forming, registering and electing the leadership of BMUs. The BMU committees are required to include representation from the four main community-level stakeholder groups (boat owners, boat crew, fish traders and the 'others' category), and at least three members must be women. This is intended to promote equity of stakeholders and ensure that all stakeholders, including the traditionally marginalised and poorer within fishing communities (women and boat crew), have a say in decision-making.[18]

While BMUs represent stakeholders from a specific landing site, the Association of Fishers and Lake Users (AFALU) is a civil society organisation with a geographically broad membership. AFALU's membership consists mostly of boat owners and fishers, who aim to support the sustainability of Lake Victoria's fisheries through peer education and co-operation with authorities in rooting out illegal fishing practices.

Figure 5: Fisheries governance actors



Source: Author's own

POLICIES AND NATIONAL LEGISLATION

'Uganda has very good laws, but they are not implemented ... often laws are driven by external donors, so there is little public knowledge and no accountability.'

NGO representative

'Behind the official fabric of policies and such ... there is a very different reality on the ground.'

Fish-processing company owner

The development of shared policies among the partner states of the LVFO has played an important role in setting fisheries management objectives, developing common responses to challenges and harmonising catch-assessment methods. The partner states have also developed national legislation through which they pursue the common objectives outlined in LVFO policy documents. While it is important to acknowledge the significance of regional policies and national legislation, the study revealed that fisheries management

challenges on Lake Victoria arose primarily not from a lack of policies, but from a lack of policy implementation. Stakeholders identified a number of possible reasons for the implementation challenges in Uganda's fisheries sector, including insufficient funding, lack of political will, corruption and the sheer size of the surveillance area.

Regional policies

The LVFO partner states formalised policy co-operation efforts by signing the LVFO Convention in 1994 and adopted a strategic vision for the LVFO in 1999. The Council of Ministers, the senior decision-making body within the LVFO, also pursues policy co-operation, issuing communiqués on issues of shared concern.

In 2001, the first regional plan for managing the fisheries of Lake Victoria (the Fisheries Management Plan for Lake Victoria, or FMP1) was adopted. The implementation of the FMP1 led to a greater regional harmonisation of policies and plans, covering areas such as illegal fishing, management of fishing capacity, the formation and operation of BMUs, operation of monitoring, control and surveillance (MCS), and HIV/Aids in fishing communities.[19]

More recently, an update of the FMP1, the Fisheries Management Plan for Lake Victoria, 2009–2014 (FMP2), was released. Some of the important developments in the FMP2 include species-specific fisheries management plans that are aligned to the broader development plan. The first such species-specific plan was the Nile Perch Fishery Management Plan (FMP) for Lake Victoria, providing detailed information of the Lake Victoria Nile perch fishery, particularly related to stock assessments and fisheries management challenges outlined in this report. The Nile Perch FMP identifies many of the governance challenges outlined in this report. It also highlights that the real work of ensuring the sustainability of Lake Victoria's Nile perch fishery lies not so much in identifying the problems, but in moving from regional plans and commitments to effective implementation at the national, local government and community levels. Some of the key challenges outlined in the Nile Perch FMP include:[20]

- addressing the trade in undersized Nile perch in both domestic and regional markets (particularly the DRC);
- providing support to BMUs, including security, so that they can effectively carry out their duties related to addressing illegal fishing practices;
- developing National Co-management Committees; and
- addressing gaps in the fisheries survey schedule and other information-gathering and analysis-related challenges.

National legislation and the proposed National Fisheries Authority

The National Fisheries Policy (May 2004) guides the fisheries sector in Uganda. The policy outlines 13 key areas, emphasising *inter alia* the importance of sustainable fish production, decentralisation and community participation, information gathering and management, and the development of aquaculture. The broader context of these policy instruments is the move towards decentralisation, market liberalisation and sustainable development, reflected in Uganda's national Poverty Reduction Strategy Plan.[21]

While the National Fisheries Policy provides an important strategic framework for the fisheries sector in Uganda, it is widely agreed that current legislation needs to be updated to conform to the principles outlined in the policy document. In fact, a draft Fisheries Bill has been in existence since at least 2005 but to date has not been enacted. Until the Fisheries Bill is enacted, the most important legislation for fisheries management in Uganda remains the outdated Fish Act of 1967.[22]

In the absence of updated fisheries legislation, the DFR has introduced a number of statutory instruments to address key issues in fisheries management. For example, legislation was introduced to allow for co-management practices through community-level BMUs. Legislation was also introduced (in 2001) to delegate licensing powers from the DFR to district governments. The implications of this decision will be discussed more fully in Chapter 4, but suffice to say that in 2011, licensing powers were transferred back to the DFR.

Both the National Fisheries Policy and the draft Fisheries Bill refer to the establishment of a Uganda Fisheries Authority (UFA). According to the National Fisheries Policy:[23]

> A Uganda Fisheries Authority is proposed to address the concerns and will offer broad capacities and responsibilities required of a fisheries management institution .... The proposed UFA is to be an autonomous institution under its parent ministry and has a competitively appointed chief executive, with a governing board appointed by the minister.

It is envisioned that the UFA will completely replace the DFR and take over its responsibilities and functions within the fisheries sector in Uganda.[24] Considerable preparatory work has already been completed, including a UFA business plan. The business plan proposes a funding model where about 45% of the UFA's budget will be derived from local government payments, 43% from a processing levy that will largely be collected from the industrial fish processors, and the remaining budgetary requirements will be met through donor funding.

In addition to outlining the establishment of the UFA, the draft Fisheries Bill addresses many pressing issues in the governance of Uganda's fisheries. For example, the legislation specifies stronger penalties for transgression of fisheries regulations. During the field research conducted for this report, officials and BMU leaders identified lax penalties as a major hurdle to combating the widespread use of illegal fishing gears. The legislation further clarifies the roles and responsibilities of the national fisheries authority, DFOs and BMUs, outlines important regulations related to taxes and revenue generation (such as the establishment of an levy on Nile perch exports), and specifies the details of the fisheries licensing system.

In some respects, the draft Fisheries Bill formalises and clarifies existing arrangements, for example, those related to BMUs and the licensing system. Nevertheless, these clauses will help address the existing confusion of roles and responsibilities in fisheries governance, and can serve as an important tool to enhance accountability in the sector. The legislation also addresses some of the central issues that have hampered effective governance in recent years, particularly those related to sustainable financing and penalties for transgressions of fisheries regulations. If implemented, therefore, the Fisheries Bill could unlock further critical interventions to address the sustainability of Uganda's fisheries. However, it is precisely in the implementation of policies and legislation that

Uganda has faced particular challenges, and implementing the Fisheries Bill relies in many instances on addressing broader concerns. For example, if local government payments are to account for 45% of the UFA's budget, improved financial management and transparency will be needed at the BMU and local government levels, as well as greater support from the national level to these actors.

Interviews conducted during March/April 2011 revealed considerable uncertainty over both the Fisheries Bill and the UFA. During the past six years, remarkably little progress seems to have been made in finalising these major legislative and institutional mechanisms, which is of particular concern given the increase in illegal fishing practices and the significant decline in fish stocks over this period. The establishment of a new parliament following the national elections of 18 February 2011 and the appointment of a new Minister of State for Fisheries in 2011 provide an important opportunity for the DFR, the Minister of State for Fisheries, and the relevant parliamentary committee to meet in order to assess progress and prioritise actions.

Fishermen repairing nets at Ggaba landing site

CHAPTER 4

GOVERNANCE CHALLENGES

As the previous chapters make clear, Uganda possesses a relatively comprehensive institutional and policy framework for the management of its fisheries resources, although the existing legislative framework needs to be updated urgently by the passing of the Fisheries Bill. The importance of establishing the existing governance framework should not be underestimated, nor should the significant achievements in certain areas of governance, such as harmonising the monitoring, control and surveillance measures among the three partner states and establishing a network of BMUs. Nevertheless, the basic objective of managing fisheries resources to achieve maximum sustainable socio-economic benefits is not being achieved.

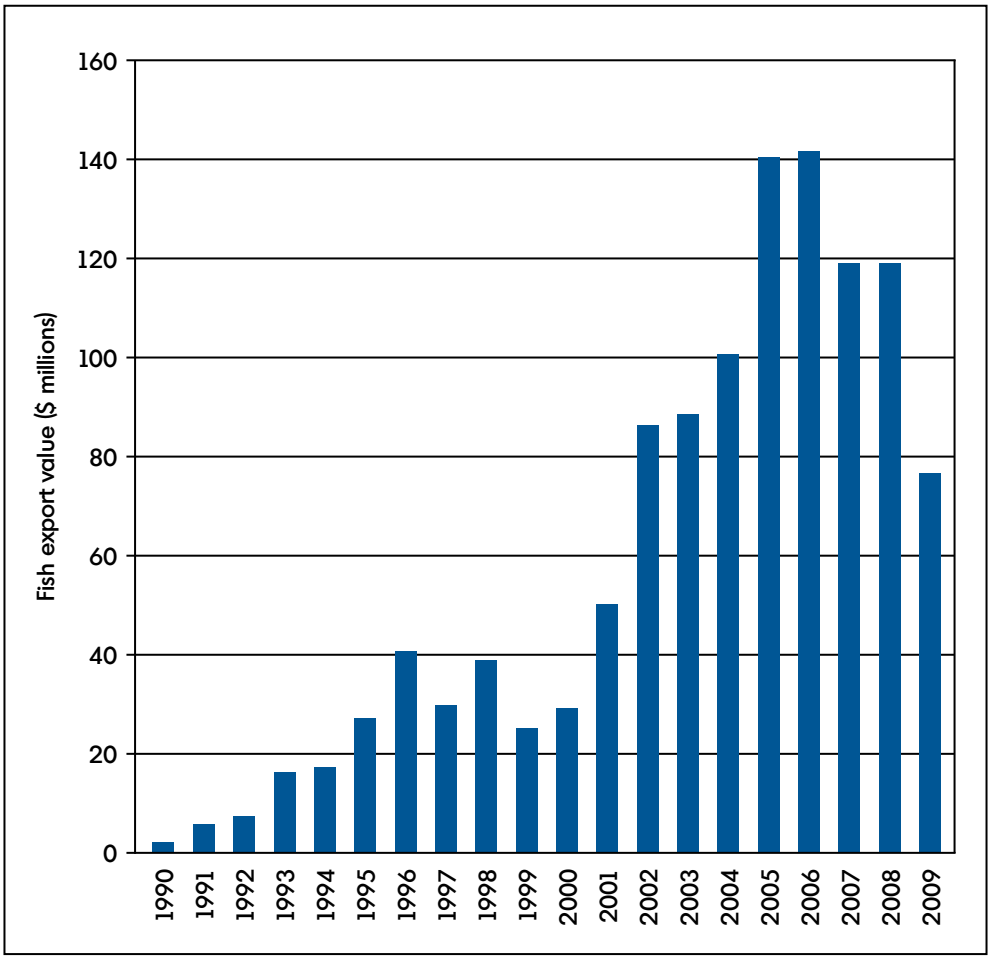
Figure 6 (see page 25) shows the development of Uganda's fish exports since 1990, when exports started to increase rapidly from a very low base. Growth was checked by three separate bans from the EU between 1997 and 2000, caused respectively by the failure to meet EU safety standards, a cholera outbreak and pesticide residues. Improved sanitation and processing standards led to a 'golden age' for Uganda's Nile perch trade, with export volumes in 2005 more than triple those of 2000. During this time, enforcement of fishing regulations was considered 'sporadic, unpredictable and [could] often be circumvented by knowing or bribing the right people'.[25]

By 2007, fishing in Lake Victoria was clearly becoming unsustainable. Between 2006 and 2008, fish exports dropped by 31%, falling a further 32% in 2009, when only 15 600 tonnes were exported against a high of 39 000 tonnes in 2005. A number of fish-processing facilities closed down in this period, and the remaining factories are operating at 30–40% of capacity. Despite existing regional and national fisheries governance institutions and supporting policy and legislation, the Nile perch fishery is not being governed sustainably. The remainder of this section will identify some of the factors that contribute to this situation.

INCREASED FISHING PRESSURE

The potential economic rewards of the Nile perch fishery have attracted an increasing number of fishers, boat owners and traders into the industry. Between 2000 and 2010, the number of fishers operating in Uganda's share of Lake Victoria increased by 63%, to a total of 56 957, and the number of fishing crafts grew by 50%.[26] More intensive fishing practices have also increased fishing pressure. For example, more hooks are added to long-lines; nets that in the past were set overnight are now set during the day as well; and gill nets are often joined vertically to fish a larger portion of the water column. This increase in fishing pressure (ever more fishers chasing ever less fish) has meant that catch records do not fully reflect the damage being done to Nile perch stocks. A more accurate measure of fish density is given by CPUE, which measures the quantity of fish caught per unit of

Figure 6: Uganda fish exports, 1990–2009

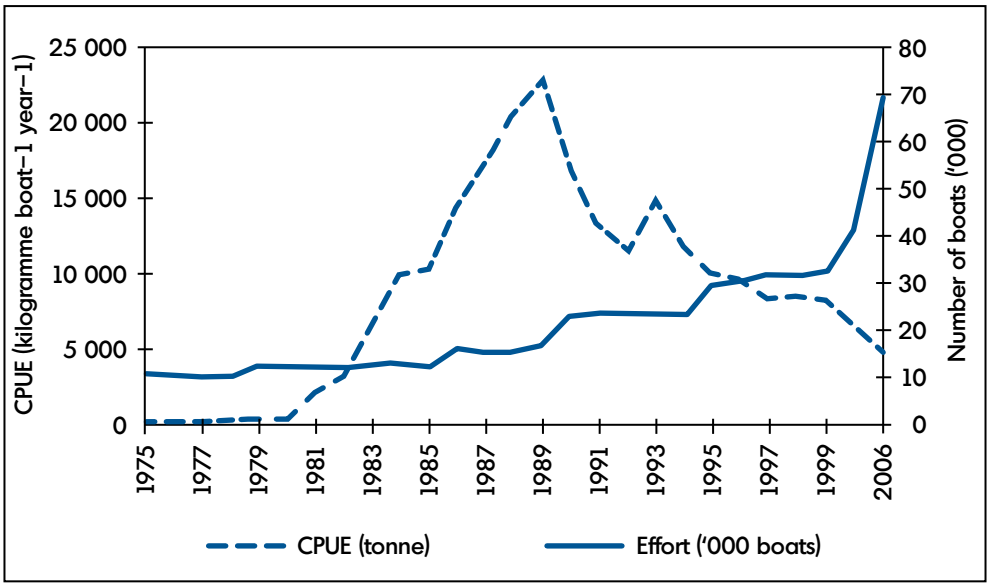


Source: Hammerle M *et al.*, *The Fishing Cluster in Uganda*, final report for Microeconomics of Competitiveness. Cambridge, MA: Harvard University Press, 2010, p. 19

fishing effort (in this case the unit of fishing effort is the number of boats). As shown in Figure 7 (see page 26), the CPUE in the Lake Victoria Nile perch fishery has declined significantly in recent years.

All fishers are required by law to obtain fishing licences, and fishing boats must be registered. These requirements can potentially serve as a tool to restrict access to the lake and manage fishing pressure. However, when the DFR delegated licensing authority to district councils, the local governments saw the issuing of licences and permits as an opportunity for revenue generation. As a result, fishing licences and boat permits were issued without considering the impact of increased fishing pressure on the health of the fishery. Poor surveillance and enforcement have further contributed an unsustainable increase in fishing pressure.

Figure 7: Catch per unit effort in the Lake Victoria Nile perch fishery



Source: Warui SW, 'Rents and Rents Drain in the Lake Victoria Nile Perch Fishery', United Nations University Fisheries Training Programme. Reykjavik: The United Nations University, 2007, p. 22

In the short term, fishing pressure can be alleviated by effectively addressing the use of illegal fishing gears and the trade in immature Nile perch, which are having a significant impact on the regenerative capacity of Lake Victoria's Nile perch stocks. However, in the medium to long term, a limited-access fishery is essential. Restricting access to the fishery will face considerable political and community resistance, as Lake Victoria has traditionally been an open-access fishery with no restraints on participation. Indeed, in times of economic hardship, fisheries may serve as an 'employer of last resort', particularly for fishing crew who utilise their employer's boats and fishing gear. Nevertheless, the level of overfishing and Uganda's rapid population growth will require the DFR to move towards a controlled-access fishery.

Various mechanisms are available to limit access to fisheries, such as individual transferable quotas, territorial user rights and community fishing rights.[27] Through debate, regional, national and community stakeholders need to identify the most appropriate system for Lake Victoria. In an effort to manage fishing pressure, the Minister of State for Fisheries recently placed a moratorium on the issuing of new fishing licences, which is a step in the right direction. Yet, since 2008 few or no licences have been issued in any event because of the DFR's efforts to wrest the licensing function from local governments. As licences and permits have to be renewed annually, a large number of fishers and boat owners seem to have expired licences. The DFR must therefore follow up on the moratorium decision by carrying out inspections and managing the renewal of existing licences and permits. Regulating the number of fishers and boats will be impossible without a functioning licensing system. Simple and inexpensive steps can also be taken to increase transparency and improve the regulation of fishing practices. For example, all vessels should have clearly visible registration numbers, and a list of all fishers and boats registered in the area should be displayed at the local BMU office.

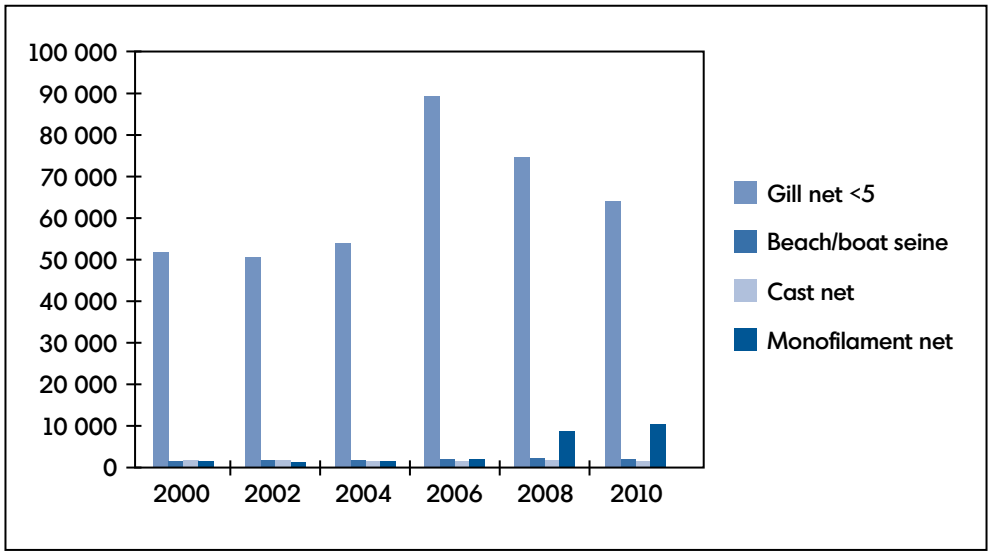
ILLEGAL FISHING GEAR

To prevent the capture of immature Nile perch, Uganda and the other LVFO states have established minimum mesh sizes for nets that can be used in the fishery and banned monofilament nets, cast nets and beach seines. Despite these regulations, the use of illegal nets remains a widespread problem, which many stakeholders identified as the primary cause of declining Nile perch stocks.

The Frame Surveys, which are carried out every two years on Lake Victoria, assess the prevalence of various types of illegal gears. However, as fishers generally attempt to conceal illegal nets, these figures may significantly underestimate the prevalence of illegal fishing gears. The survey shows that small-mesh gill nets are by far the most widespread form of illegal fishing gear, but monofilament nets have also become common, increasing rapidly from a low base of 1 563 in 2006 to 12 115 in 2010.[28] As much as 40% of fishing gear used in Uganda is estimated to be illegal,[29] and compliance behaviour is likely to be comparable to neighbouring Tanzania.

A detailed survey in Tanzania identified three primary groups of fishers: one group (about 45% of the study sample) never violated net-size regulations, a second group (47% of the sample) alternated between compliance and violating behaviour, but 8% of the sample were persistent violators of mesh-size regulations. This final group systematically violated the mesh-size regulation and, when arrested, bribed their way out of punishment.[30] BMUs have a critical role to play in educating fishers of the regulations and the link between fishing practices and sustainability of fish stocks. Monitoring and enforcement must be implemented consistently to increase the costs of non-compliant behaviour. Nevertheless, the study of Tanzanian fishers suggests that a small group of systematic violators require stronger deterrence actions, such as the suspension of fishing licences or even imprisonment.[31]

Figure 8: Illegal fishing gear usage, 2000–2010



Source: LVFO, *Frame Survey 2010*. Jinja: LVFO, 2010

The widespread use of illegal fishing gear is unlikely to result from ignorance of the regulations among fishers, as awareness programmes and ongoing peer education were introduced when the BMUs were established in fishing communities around Lake Victoria. The fieldwork undertaken for this report indicates that the widespread use of illegal fishing gears results largely from a) poor enforcement of regulations; b) the ability to avoid prosecution by paying bribes; and c) pressures resulting from declining fish stocks.

POOR MONITORING AND SURVEILLANCE CAPACITY AND THE LACK OF FUNDING

The three primary role players in the monitoring of fishing activities during the capture phase are the DFR, local government fisheries officers and BMUs. A small contingent of police officers generally accompanies these patrols, to provide security and to arrest transgressors.

As has already been emphasised, the total surveillance area is very large, and the fishing activities are dispersed geographically throughout Uganda's share of the lake and operationally among many small vessels. These conditions mean that centralised control of surveillance can only have limited effectiveness in combating illegal fishing practices. DFOs and BMU members have an important role to play, conducting their surveillance activities either on the lake itself during patrols, or at the landing site where fishers and fish traders bring their catch ashore.

Fisheries officers and BMU members have identified funding constraints as a major obstacle to carrying out patrols. BMUs are funded primarily through Fish Movement Permits, a simple taxation system by which fishers pay a small fee for each kilogramme of fish that they bring to a landing site. These funds are submitted to the local council, which is then required to remit 25% back to the BMU in order to fund its activities. The remaining 75% of the funds are intended, at least in part, to fund the fisheries management activities of the area's fisheries officers.

Although BMUs situated at landing sites with a relatively large throughput of fish are able to collect their operating funds, smaller landing sites obtain very few funds through this taxation system, especially as only a quarter of these funds are received back from the local council. Furthermore, a common complaint among BMUs is that they do not receive the full 25% of the fees collected. The fisheries officers face a similar predicament. Local councils should use part of the funds submitted by the BMUs to fund the activities of the fisheries officers they employ. However, in many cases these taxes represent one of the few revenue streams for the local council, and these funds are often directed to other priority areas such as waste management and sanitation.

Funding constraints are also a challenge at national level. Research suggests that a well-managed fishery produces economic rents of 10–60% of the gross value of landings (an economic rent is the maximum economic surplus that can be extracted from the fishery while the fishing industry continues to operate efficiently).[32] Therefore, in Uganda, where the annual gross value of landings is generally in the region of $200 million, potential economic rents should be at least $20 million.[33] Ideally, these rents should be used in part to manage the fishery sustainably, so that fisheries governance is managed on a 'user-pays' principle and does not rely on government transfers. However, in Uganda, the

rents are not properly extracted within the fishery, and even those extracted with current fiscal instruments are hardly ever reinvested for managing and sustaining the country's fisheries.[34] The Minister of State for Fisheries, Ruth Nankabirwa, has claimed that Uganda loses $250 million through illegal fishing and $70 million in tax evasion.[35]

The DFR captures rent from the fish-processing industry through an industrial fish processing licence (annual payment of $256) and a health inspection certificate, which is required for each consignment of fish export (about $10 per consignment). These fees do not allow the DFR to benefit effectively from the rents generated by the fishery. In contrast, in Tanzania a 6% tax is charged on fish exports, which, according to the LVFO, has made Tanzania's fisheries sector largely self-financing.[36] While a levy on fish exports has been muted for a number of years in Uganda, nothing has yet been put in place.

One of the more successful efforts at addressing the trade in immature Nile perch is the self-policing system instituted by the fish-processing companies operating on Lake Victoria through their industry association, the UFPEA. The UFPEA rose to prominence in the late 1990s when it mediated and co-ordinated a response to the EU's banning of fish exports from Uganda. Up until 2006, the UFPEA focused primarily on ensuring ongoing market access to the EU and on marketing Nile perch as an affordable alternative to other sources of white fish. However, when exports dropped significantly in 2006, the fish-processing facilities realised that unsustainable fishing practices were compromising their continued survival. Throughout this time a size limit of 50 cm had been in place for Nile perch to prevent the capture of immature fish. However, poor enforcement by the DFR meant that fishers and fish processors widely ignored the regulation. Therefore, the UFPEA funded an inspection team to identify fish processors who were accepting undersize fish. The UFPEA did not have the authority to penalise transgressors and so partnered with the DFR, which could revoke the sanitation permit required for export. The first inspections were conducted in September 2007 and have proven to be very successful. Since 2010, the EAIFFPA has co-ordinated these inspections at a regional level. The EAIFFPA inspection team consists of one inspector from each of the three countries bordering Lake Victoria and is funded entirely through the contributions of private sector members of these countries' fisheries associations.

CORRUPTION

The Nile Perch Management Plan explicitly recognises that 'the current level of fishing and fish trade illegalities reflect not only the inadequate resources allocated to management but also corruption within the system that feeds off such illegalities'.[37] Transparency International's 2010 Corruption Perception Index places Uganda 127th out of 178 countries. Corruption across all levels of government and society is perceived to be common, and the situation is no different in the fisheries sector. Corruption can take place at various stages of the surveillance and prosecution process. Bribes may be paid to fisheries inspectors or BMU leaders to avoid arrest or to buy back confiscated fishing gears. Police may be bribed to escape detention, and magistrates may be bribed to avoid prosecution.

Corruption also affects the surveillance activities of fisheries officers and BMUs. Although both fisheries officers and BMU members may be involved in corrupt practices,

the BMUs face a further challenge because of their leadership selection process. The membership elects the leadership of the BMUs, which is intended to ensure that BMU leaders have legitimacy within the local community and that corrupt or ineffective leaders may be removed. Unfortunately, in areas where illegal fishing is common, community members may deliberately elect leaders who are corrupt or ineffective, thereby ensuring that the status quo is maintained.

The BMUs within a particular district are organised under a district BMU, and ideally the chairman of the district BMU should take the lead in addressing corruption or inefficiency among the BMUs in the area. Fishers who seek to report illegal behaviour among the BMU leadership also have recourse to the DFO or the DFR. Unfortunately, detecting and effectively acting against poor BMU leaders can be problematic when most fishers themselves participate in illegal activities and therefore have no incentive to change their leadership. It is difficult to assess the extent to which BMUs are dysfunctional, either as a result of lack of funding or poor leadership. During some stakeholder interviews it was estimated that as many as half of all BMUs may not be performing even basic surveillance and peer-education functions.

Interviews with fisheries officers at the DFR revealed a common perception that many BMUs and even local fisheries officials may be corrupt. For example, during recent operations to confiscate illegal fishing gears in the Namayingo District of Lake Victoria, the DFO claimed that the chairpersons of the local BMUs interfered with the inspections, 'when you want to carry out an operation, they either try to frustrate you by refusing to participate or inform the fishers to hide the fishing gear'.[38]

The DFR's response has been to depend increasingly on centrally orchestrated patrols that bypass the local BMU leadership. However, this strategy is unlikely to prove effective, as the number and geographic reach of the DFR patrols is wholly inadequate to deal with illegal fishing. Furthermore, the larger patrol boats used by the DFR can easily be identified by fishers, who warn each other by cell phone and thus avoid detection. Centrally orchestrated patrols have a role to play in addressing illegal fishing 'hotspots' or investigating areas where BMU leaders are suspected of participating in illegal fishing, but these activities must be combined with efforts to strengthen and support the BMU system as a whole. Problems within the system need to be addressed through co-operation among the DFR, local government fisheries officials, district BMU chairpersons and BMUs. Circumventing or undermining the BMU system, by attempting to re-centralise MCS activities, threatens to undo the significant progress made in co-management efforts without offering a sustainable alternative.

ECOSYSTEM FACTORS

During the course of the 20th century, the Lake Victoria basin underwent a rapid increase in population and agricultural production, which has contributed to rapid urbanisation, increased deforestation, fertiliser use in agriculture and biomass burning. These processes have contributed to eutrophication (nutrient enrichment of water bodies) in Lake Victoria. Although the eutrophication process may initially have supported the Nile perch boom, as increased nutrient levels increased the productivity of the lake's food web,[39] continuing eutrophication contributes to algal blooms and the growth of anoxic (oxygen-depleted)

water layers. The ideal nutrient concentrations in Lake Victoria to support a productive fishery, while maintaining an acceptable level of water quality, may already have been exceeded.[40] As Nile perch are more sensitive to low oxygen levels than other species such as tilapia and catfish, eutrophication poses a real threat to the Nile perch fishery. Therefore, it is important that broader ecosystem factors are addressed in conjunction with efforts aimed at curbing harmful fishing practices.

BMUs can play an important role in addressing pollution and eutrophication problems at a local level. For example, at the Masese landing site near Jinja, local fishers noticed that a stream flowing into the lake was discoloured and causing fish deaths. The local BMU was alerted and sent an inspection team, which photographed the site and reported the incident to health officials. As a result of this co-operation, the source of pollution was identified, and the responsible company had to install a waste treatment system.

The urgency of many of the problems facing the Nile perch fishery, such as the widespread use of illegal fishing gears and the trade in immature Nile perch, tends to divert focus from broader ecosystem factors. Nevertheless, these ecosystem factors, particularly eutrophication and pollution, present significant threats to the sustainability of Lake Victoria's Nile perch. Addressing these challenges will require policies and awareness campaigns that reach down to the level of local communities and farmers. National and local governments should work together to improve sanitation, waste management and agricultural practices in order to ensure that Lake Victoria's water quality does not decline to dangerous levels.

Fish sold for local consumption at Ggaba landing site

Is aquaculture the answer?

In Uganda, the increasing pressure on capture fisheries together with the prospect of significant population growth and competition for resources has led to a growing interest in aquaculture. Uganda has a long history of aquaculture production, although these efforts have not met with large-scale success. During the colonial period, aquaculture was promoted as a means to enhance rural family diets, and in the 1960s, 11 000 ponds were reported to be in production. However, by the 1980s, political instability and a general collapse of infrastructure had reversed the development of small-scale aquaculture.[41]

A recent review of aquaculture in Uganda noted that the current private sector aquaculture industry consists of one foreign-owned, cage-based fish farm at Jinja, around 50–100 medium-scale fish farms (mostly pond based, but a few small-cage based) most of which are operating well below production capacity, and many thousands of small-scale fish farmers with fairly unproductive fish ponds.[42] Aquaculture production focuses predominantly on tilapia and catfish, as various biological characteristics make Nile perch unsuitable for large scale aquaculture production.

Despite the difficult history of aquaculture in Uganda, the country has enormous potential for the development of aquaculture production. A recent estimate found that large-scale cages in the Uganda sector of Lake Victoria alone could support an industry producing 100 000 tonnes per year without any significant environmental impact.[43]

In addition to Uganda's abundant water bodies, other important factors in aquaculture development include available and affordable formulated feeds, quality fingerlings, strong research and extension, and the development of appropriate markets.[44] These areas are currently being supported through research conducted at Uganda's Aquaculture Research and Development Center based at Kajjansi. The EU is also initiating a donor programme aimed at supporting the further development of aquaculture in Uganda.[45]

The development of aquaculture can be an important means to alleviate fishing pressure on wild stocks, contribute to food security and create opportunities for economic development. However, from the perspective of Uganda's Nile perch fishery, it is important to emphasise that aquaculture does not in itself solve the problems of poor regulation, overfishing and illegal fishing practices that threaten wild-caught fisheries. Both aquaculture and capture fisheries require effective governance and development, and aquaculture may supplement but will not be able to substitute for the benefits of a healthy and well-regulated capture fishery.

CHAPTER 5

JINJA CASE STUDY

OVERVIEW OF THE JINJA DISTRICT

Jinja is Uganda's second largest town, situated 87 kilometres east of Kampala at the point where Lake Victoria flows into the White Nile. It was in Jinja that the very first Nile perch were introduced to the lake in 1954. The town now forms the centre of Uganda's fishing industry, is the base of many of the industrial fish-processing facilities and hosts the headquarters of both NaFIRRI and the LVFO. The area contains five landing sites: Masese, Kisima I, Kisima II, Busana and Wairaka.

During the fieldwork phase, several visits were made to various sites in the Jinja area, in particular the Masese landing site. Focusing on a particular landing site allows for a more detailed picture of local area dynamics, illustrating to what extent regional and national policies are in fact being implemented in local communities. It should be noted that the effectiveness of BMUs differs significantly at the over 500 landing sites currently found among the islands and shoreline communities of Uganda's share of Lake Victoria. A number of factors influence the effectiveness of the BMUs at these landing sites, for example, throughput of fish (which affects revenue collection), proximity to major urban centres, the extent of co-operation between the BMU and local fisheries inspectors and police, and quality of leadership. Therefore, in order to provide a more comprehensive picture of community dynamics at landing sites, the field work also included visits to various landing sites in the Kampala and Entebbe Districts.

The fish-weighing station at Masese landing site

The Masese landing site is situated on the outskirts of Jinja. As with many landing sites, the area is poorly developed. The *Frame Survey 2010* showed that only 39% of Uganda's landing sites have toilet facilities and less than 5% have electricity. At Masese, a concrete fish weighing station has been constructed as well as an adjoining fish processing area, which is used primarily for tilapia. In addition to fish, the landing site is used for the transport of people and various goods between the mainland and nearby islands.

Masese is an important transit point for fish caught further out in the lake. Statistics gathered by the Masese BMU showed that a relatively small amount of Nile perch is caught in the area adjoining the landing site (an average of just 230 kilogrammes per month in 2010). Tilapia is the most common fish landed at Masese. In 2010, about 5 500 kilogrammes of tilapia were caught each month in the area (these figures combine Masese landings with those of two smaller landing sites nearby, Kisima I and Kisima II; disaggregated statistics were not available). Unfortunately, no statistics were available to show the total throughput of Nile perch, although these figures would be significantly larger than those cited above, given that most Nile perch is brought by boat from other fishing areas.

COMBATING ILLEGAL FISHING PRACTICES IN THE JINJA DISTRICT

Discussions with the leadership of Masese BMU and the chairman of the Jinja District BMU revealed that the area faced many of the same challenges as those of other districts.

The landing site is also used for the transport of people and various goods

Trucks at the fish-weighing station waiting for Nile perch

All interviewees agreed that over the past 10 years, fishing pressure and the use of illegal fishing gear have increased markedly. The BMU chairman linked declining catches specifically with the emergence of a commercial fishery, saying that in earlier years community members had only caught fish for their own consumption and most of the plentiful fish 'died of old age in the lake'. These declining catches were tempered to a degree by the increasing number of fishers, the more intensive use of legal fishing gears and the increasing use of illegal fishing gears. Unfortunately statistics on catches in the area were only available for 2009 and 2010, which could not reflect long term trends in catches. In fact, average monthly catches improved from an average of 160 kilogrammes per month in 2009 to 230 kilogrammes per month in 2010. Members of the Masese BMU said that this improvement is probably largely due to increased fishing pressure, but could also reflect improving fish stocks as a result of patrols confiscating illegal fishing gears.

The chairman of the Jinja District BMU was able to produce records of patrols carried out in the district from June 2009 to February 2010. These records show a relatively high level of activity among the district BMUs. A broad range of illegal fishing gears were confiscated during the patrols, but by far the most common illegal gears were small-mesh gill nets and monofilament nets. The BMU leaders explained that, in most cases, the gears were confiscated and destroyed on return to the landing site. Fishers using illegal gears were often not arrested because the confiscation of illegal gear was usually considered sufficient punishment, especially for first-time offenders. Furthermore, as BMU leaders are

fishers who are elected by the community, not prosecuting helps to maintain community support for BMU activities.

A number of interviewees noted that efforts at combating illegal fishing activities were compromised by local courts, which tended to issue minimal fines to offenders. Although BMUs deal with small infringements or first-time offenders, they rely on the courts to prosecute those who habitually disregarded regulations. The Jinja District BMU chairperson argued that the courts should deal decisively with those 'notorious by nature' members of the fishing community by issuing prison sentences to send a clear message that illegal fishing practices would not be tolerated.

Table 1: Record of illegal gears confiscated during lake patrols in the Jinja District, June 2009–Feb 2010

	Undersize nets[46]	Monofilament nets	Beach/boat seine	Cast nets	Hooks
June 2009	114	26	8	12	118
July 2009	0	0	1	6	0
August 2009	88	164	11	6	0
September 2009	11	7	10	0	0
October 2009	76	53	3	7	0
November 2009	53	17	4	0	0
December 2009	34	32	0	0	0
January 2010	not specified	77	2	8	10
February 2010	0	23	10	9	0
Total	**376**	**399**	**49**	**48**	**128**

Source: Jinja District BMU records

The BMU patrol records show clearly that the use of illegal fishing gears is common in the area and difficult to eliminate. Even with relatively frequent patrols and the confiscation of large numbers of illegal nets, the number of illegal gears confiscated during patrols does not show a downward trend. During a trip to one of the nearby islands, a number of fishers could be observed openly using monofilament cast nets, which are illegal. It appears that fishers and boat owners are willing to replace illegal gears rather than switch to legal fishing gears.

Discussions with members of the AFALU, a non-governmental organisation consisting mostly of boat owners and fishers, provided an opportunity to understand some of the pressures that lead to the use of illegal fishing gears. Survey data shows that Nile perch stocks have not only declined, but that a far larger proportion of the total population now consists of immature fish. Due to the prevalence of illegal fishing, a large proportion of Nile perch are caught before they reach maturity. Fishers may thus opt to target immature fish rather than face the risk of catching few or no large fish. Furthermore, fishers are finding that they have to travel further to make decent catches of mature perch, increasing

their fuel costs and the financial risk of unproductive trips. A vicious cycle therefore emerges where declining stocks drive fishers to employ damaging fishing practices, which lead to further declines in stocks.

Interviewees spoke frankly about the influence of corruption and political interference in fisheries management. The case of one local BMU's chairperson, who had been engaging in illegal fishing activities, was dealt with effectively through the district BMU structure (where the leadership of the BMUs in the area met once a month). The collective decision was to suspend the errant BMU chairperson for six months, an action which was perceived to have effectively addressed the situation.

A number of BMU members noted during interviews that 'politics' are a problem at a local level, explaining that certain boat owners or fishers are able to use political influence or bribes to avoid prosecution. A number of respondents also reported that political pressure had been placed on BMUs to refrain from carrying out patrols in the months ahead of the election, which took place in February 2011. Although these claims could not be substantiated, few or no patrols had been carried out during this period, at least in the Jinja and Kampala Districts.

The Jinja District BMUs were among the first on Lake Victoria to create a special no-fishing zone in an area recognised by local fishers as important for fish breeding. However, infringements of this no-fishing zone are common. During the time of fieldwork the local BMUs were preparing to replace the beacons demarcating the no-fishing zone, which were destroyed by local fishers. Further evidence of the difficult relationship between the BMU and local fishers could be found at the landing site itself. Through the support of the National Agricultural Advisory Services programme, the Masese BMU had acquired fish cages and fish feed for a small tilapia aquaculture project. The project had reportedly proceeded well, and had the support of most local fishers, as the fish feed that passed through the cages also attracted wild fish to the area. During the field research period, however, the cages were being repaired after a group of fishers had broken the cages and removed the tilapia.

COMMUNICATION AND CO-OPERATION AT NATIONAL AND LOCAL GOVERNMENT, AND COMMUNITY LEVELS

Natural resource governance in Uganda has reflected global trends towards decentralisation and co-management. In practice, however, the partnership and decentralisation discourse masks a sometimes difficult relationship between national and local levels of government. Two key relationships are those between the DFR and local government fisheries officers, on the one hand, and the DFR and BMUs on the other.

As already noted, DFOs and local fisheries inspectors are employed by local governments rather than the DFR itself. DFR officials indicated during interviews that this decentralisation process creates communication and accountability problems, as local government fisheries officers are no longer linked in a clear way to the national structure. Ironically, local government fisheries officers interviewed in the course of research maintained that communication from the DFR is very poor and that local government fisheries officers are often sidelined during DFR patrols.

BMUs also complained of poor communication and co-operation by the DFR. A member

of one of the Jinja BMUs observed, for example, 'we are in a co-management system whereby we should be sharing information all the time, but the DFR does not act and whatever they do, they do behind closed doors. They only come for us when things go wrong'.[47]

During interviews, some DFR officials claimed that BMUs were largely ineffective and were often themselves involved in illegal fishing practices. Although this may be true in some cases, the apparent tendency within the DFR to rely increasingly on centralised MCS activities is unlikely to be an effective solution to the problem. These observations are echoed in a report published in 2003, which noted several instances of antipathy between fisheries officials and fishers. The report pointed out that this state of mutual distrust is perhaps the biggest barrier to effective management partnership and can only be overcome when the fisheries department is perceived to be operating in the interests of fisherfolk and can demonstrate its commitment to this new style of management.[48] This view is supported by extensive field research into fisheries co-management initiatives in Africa, which emphasises that one of the key factors determining the success of such co-management initiatives is the level of co-operation between the fisheries management authority and local community structures.[49]

FUNDING CHALLENGES AT THE LOCAL LEVEL

The Masese BMU generates most of its funds from fish movement permits. The funds are collected from fishers and fish traders and submitted to the local municipality, which remits 25% back to the BMU. However, some members of the BMU maintained that the funds due to the BMU were not always paid in full by the local municipality. The BMU used these funds primarily to carry out patrols, for which fuel was the primary expense.

The funds retained by the local council are intended in part to fund the salaries and activities of the local fisheries inspector and the DFO, but interviews revealed that these actors were critically underfunded. The DFO in Jinja argued that, although fishing activities presented one of the few sources of revenue for the local government, fisheries management was not a priority area. Instead, local government used funds generated by BMUs to pay salaries in other departments and deliver basic services such as sanitation. Although local government faces difficult choices in the allocation of funds, particularly in an area where fishing is the primary economic activity, it is critical that sufficient funds are provided to support governance of the fisheries. There is an urgent need to ring-fence a portion of the funds generated by fisheries for the salaries and activities of fisheries officers at the local and district level.

The efforts of the DFR and private companies to address the use of illegal fishing gears and the trade in immature Nile perch cannot succeed without the co-operation of community level actors through the BMU system. The case study research has shown how BMU participants are attempting to deal with illegal practices often in the face of opposition by members of the fishing community, poor financing, and a perceived lack of support by the DFR. It must also be recognised that corruption and mismanagement are problems at all levels of fisheries governance, including BMUs. However, as the experiences of the Masese BMU have shown, these community structures can also provide a unique source of efficient and appropriate solutions to the challenges that confront the fisheries sector.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

The sustainable governance of Uganda's Nile perch fishery requires concerted action on various fronts, particularly within the DFR. However, many of the critical areas that the directorate will need to address require the co-operation of other stakeholders within the governance system, including the Parliament of Uganda, the Ministry of Justice and Constitutional Affairs, NaFIRRI, local government fisheries officers and BMUs. The past decade has seen little progress in areas essential for the sustainable exploitation of Uganda's Nile perch resources, including implementing an effective funding model at national, local government and BMU levels, passing important fisheries legislation, and combating the local and regional trade in immature Nile perch. At the same time, important achievements have been made in the development of policies and institutions, such as the network of BMUs and the Nile Perch FMP for Lake Victoria. There appears to be a new momentum aimed at passing the Fisheries Bill and establishing the National Fisheries Authority, but new legislation or new institutions are no guarantee that the sector will be freed of its current problems. The sustainability of Uganda's Lake Victoria Nile perch fishery will depend on the degree to which regional and national policies are practically implemented to shape the behaviour of the fishers and fish traders operating on Lake Victoria and in local and regional markets.

Recommendation 1: Finalisation of Fisheries Bill and National Fisheries Authority

The current deadlock in passing the Fisheries Bill must be resolved by initiating a dialogue between the relevant authorities, particularly the Parliamentary Committee on Agriculture, Animal Husbandry and Fisheries, the Minister of State for Fisheries and the DFR. Timeframes should be jointly decided and published to serve as a tool for accountability in the policy development process.

Recommendation 2: Publication of a *State of Our Fisheries* report

Policies, targets and research findings are currently distributed through a variety of reports. The publication of an annual *State of Our Fisheries* report is recommended to provide a single discussion document that will track progress and mobilise efforts in managing Uganda's fisheries. NaFIRRI would play a lead in publishing this document, with inputs from the DFR, LVFO and other stakeholders. The LVFO, through the FMP2 and the Nile Perch Management Plan for Lake Victoria, has developed an important framework for addressing governance challenges, yet the objectives articulated in these documents are unlikely to be achieved unless they are formalised in a national strategic plan for Uganda. Such a document would, *inter alia,* set national priorities for the regional priorities identified by the LVFO. For example, annual Nile perch catch volumes in relation to maximum sustainable yield, prevalence of illegal fishing gears in relation to national targets, etc.

Recommendation 3: Targeted monitoring, control and surveillance intervention by the DFR Task Team to combat the regional trade in Nile perch

The use of illegal fishing gears and the regional trade in undersize Nile perch are the two most pressing challenges in the management of Uganda's Lake Victoria Nile perch fishery. The DFR must act decisively to deal with the regional trade in undersize Nile perch, for example by impounding trucks and fining companies found to be involved in the trade of undersize Nile perch. A strict licensing system should be implemented to regulate the transport of fish.

Recommendation 4: Improving the implementation and monitoring of the licensing and permit system

The implementation of a licensing and permit system for fishers and boat owners is essential to regulate the industry and move incrementally towards a limited-access fishery. The licensing and permit system also provides a means through which the fishery provides financial support to fisheries management efforts and should therefore receive the highest priority from the DFR. The current moratorium on the issuing of new licences and permits still requires the maintenance and improvement of the licensing system, the renewal of existing licences and more frequent inspections.

Recommendation 5: Implementation of effective funding model for fisheries management

Inadequate funding hampers fisheries management in Uganda at national and local government levels. A proportion of funds generated by BMUs should be ring-fenced for financing the salaries and activities of DFOs and local fisheries inspectors. The DFR should implement periodic audits to combat poor financial management at local government and community levels. The DFR should also push for the implementation of a Nile perch export levy that will contribute to the management of the fishery, as is the case in Tanzania.

Recommendation 6: More effective oversight by parliament

Parliament needs to engage more actively in the fisheries sector. The *State of Our Fisheries* report, as outlined in recommendation 1, would serve as an oversight tool, setting targets against which performance can be evaluated. Parliament should also seek to engage more actively with various stakeholders, particularly NaFIRRI and the LVFO, to acquire the necessary information with which to hold the DFR and other role-players to account.

Recommendation 7: Engagement between DRF and local courts

Efforts by fisheries officials and BMUs to combat illegal fishing are undermined when illegal fishers are issued with small fines or avoid penalties through ineffective prosecution. The DFR needs to engage with the Ministry of Justice and Constitutional Affairs in order to address this problem at the level of local courts.

Other species of large fish in Lake Victoria include cyprinidae, tilapia, lungfish (picture above) as well as various species of catfish

RECORD OF INTERVIEWS

Stakeholder group	Institution	Title	Name	Date
Government/ multilateral organisations	Parliament	Deputy Clerk	Chris Kaija-Kwamya	14/11/2010
		Director – Library and Research Services	Innocent Rugambwa	14/11/2010
		Senior Research Officer	Richard Sendege Mubiru	14/11/2010 29/3/2011
	Ministry of Agriculture, Animal Industry and Fisheries – Directorate of Fisheries Resources	Assistant Commissioner – Fisheries, Regulation and Control	Dr Rhoda Tumwebaze	17/11/2010
		Assistant Commissioner	Lovelock Wadanya	4/4/2011
		Senior Fisheries Officer	Joyce Nyeko Ikwaput	4/4/2011
	Lake Victoria Fisheries Organisation	Executive Secretary	Dick Nyeko	8/4/2011
		Deputy Executive Secretary	Mathias Wanyama Wafula	8/4/2011
		Senior Fisheries Management Officer	Caroline Kirema-Mukasa	8/4/2011
		Senior Scientist	Dr Olivia Mkumbo	8/4/2011
	National Fisheries Resources Research Institute	Director of Research	Dr John S Balirwa	7/4/2011
		Research Scientist	Dr Stephen Sekiranda	7/4/2011
	Aquaculture Research and Development Center	Principle Research Officer	Dr Justus Rutaisire	3/4/2011
Donors/ embassies	Royal Norwegian Embassy	First Secretary	Per K Johansen	12/11/2010
		Senior Programme Officer	Samuel Kajoba	12/11/2010
	European Union	Operations Officer – Rural Development (including Fisheries)	Patrick Seruyange	3/4/2011
Private sector	Uganda Fish Processors and Exporters Association	Chairman	Philip Borel	13/11/2010
		Chief Executive Officer	Ovia Katiti Matovu	31/3/2011
	Marine and Agro Export Processing	Manager	Nitin Shingade	17/11/2010
	Niloticus LM	Manager	Rakesh Shetty	17/11/2010
	Son Aquaculture	Director	Dr Shivaun Leonard	17/11/2010

Civil society	Uganda Fisheries and Fish Conservation Association	Director	Kamuturaki Seremos	28/3/2011
	Uganda National NGO Forum	Director of Programmes	Arthur Larok	12/11/2010
	Africa Institute for Energy Governance	Chief Executive Officer	Dickens Kamugisha	11/11/2010
	World Wildlife Foundation Uganda	Manager – Oil and Gas Project	Robert Ddamulira	11/11/2010
	Advocates Coalition for Development and Environment	Manager	Onesmus Mugyenyi	25/3/2011
	Association of Fishers and Lake Users of Lake Victoria	Various	approximately 15 AFALU members	3/4/2011
Academia	Makerere University	Research Fellow – Makerere Institute of Social Research	Dr Frederick Kisekka Ntale	13/11/2010
		Personal Assistant to the Director – Makerere Institute of Social Research	Doreen Tazwaire	13/11/2010
Community and local level	Masese BMU	BMU Chairman	Nsereko John Bosko	15/11/2010 6/4/2011
		BMU Chairman assistant	Magumba Magid	15/11/2010
	Jinja District BMU	District BMU Manager	Kikomeko Abubaker	15/11/2010 6/4/2011
	Jinja Local Fish Inspector	Local Fish Inspector	Mugabi Michael Julius	17/11/2010
	Gaba BMU	Various	Members of leadership	26/3/2011
	Kasenyi Landing Site	Various	Members of leadership	28/3/2011
Other	African Development Bank	Senior Representative	Patrick Simiyu Khaemba	16/11/2010
		Agriculture and Rural Development Specialist	Asaph Nuwagira	16/11/2010
		Infrastructure Specialist	Daniel Isooba	16/11/2010
	Uganda Investment Authority	Executive Director	Prof Maggie Kigozi	11/11/2010

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