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THE KENYA CAPTURE FISHERIES VALUE CHAIN: AN AMAP-FSKG VALUE CHAIN FINANCE CASE STUDY

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By Ingrid Ardjosoediro and David Neven

The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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ACRONYMS

AFIPEK	Association of Fish Processors and Exporters of Kenya
ASCA	Accumulating Savings and Credit Association
BDS	Business Development Services
BMU	Beach Management Unit
CBK	Central Bank of Kenya
DoF	Department of Fisheries
EEZ	Exclusive Economic Zone
EU	European Union
FSKG	Financial Services Knowledge Generation Task Order, under the Accelerated Microenterprise Advancement IQC (USAID)
GoK	Government of Kenya
IFP	Industrial Fish Processors
KARF	Kenya Access to Rural Finance Program (USAID)
KBDS	Kenya Business Development Services Program (USAID)
KMFRI	Kenya Marine and Fisheries Research Institute
KSH	Kenyan Shilling
LVFO	Lake Victoria Fisheries Organization
MFI	Micro-Finance Institutions
MSY	Maximum Sustainable Yield
MT	Metric Tons
ROSCA	Rotating Savings and Credit Association
SACCOS	Savings and Credit Cooperative Society
SHG	Self Help Group
USAID	United States Agency for International Development

THE KENYA CAPTURE FISHERIES VALUE CHAIN: AN AMAP-FSKG VALUE CHAIN FINANCE CASE STUDY

EXECUTIVE SUMMARY

INTRODUCTION

This study is part of a series of case-studies on the role of finance in value chain analysis and sub-sector growth strategies. It is the outcome of a collaborative effort between two USAID funded projects: the *Financial Services Knowledge Generation (FSKG)* task order and the *Kenya Access to Rural Finance (KARF)* program.

Analyzing finance in the fisheries value chain provides an interesting case because unlike for example grains, tree crops or vegetables, seasonality issues play less of a role. The case is also interesting for the complexity of interwoven value chains: fresh and processed fish, industrial and artisanal processing, domestic and export markets, food and feed products. Analyzing the fishing value chain, with its unique social fabric and direct relationship to a fragile natural environment, also demands a discussion on the triple bottom line of economic, social and environmental issues.

Kenya's fisheries resources are important sources of food, employment and foreign exchange. Driven by a 6% GDP growth rate in recent years and changing consumer habits, fish has become an increasingly important part of the Kenyan household's diet, both directly and indirectly (as a key feed ingredient for livestock and dairy). It is estimated that the fishing industry employs over 50,000 fishermen and women, and another 800,000 persons are engaged in fish processing and trade. In addition, fish exports generated US\$50 million in export earnings in 2006.

This case-study shows how a more in-depth analysis of the strongly interlinked finance and governance issues in a value chain leads to a deeper understanding of why stakeholders behave the way they do, a way which at times at first glance may appear to be irrational. For example:

- Artisanal fish processors near Kisumu buy Nile perch offal from a processor at considerable expense, only to bury it right away in the ground at a total loss;
- Fishmongers at Kisumu fish market buy fish from wholesalers at credit with an interest rate of more than 10% (per week) while alternative credit at 2% is readily available;
- Ice plant operators around Lake Victoria either do not sell ice or sell volumes far below capacity, while at the same time there is a large unmet demand.

In turn, this deeper understanding of the value chain will facilitate the design of more effective growth strategies. For the case of the capture fisheries sub-sector in Kenya, we show here that a weak financial

structure is a key constraint and that addressing it while taking the triple bottom line into account should be an integral part of any development program aimed at sustained growth in this value chain.

MARKETS

A wide variety of markets are linked to the capture fisheries value chain. The four main markets are the export markets for industrially processed fresh and frozen Nile perch filets, and the domestic markets for fresh tilapia, artisanally processed fish (Nile perch, tilapia, omena¹) and feed grade omena. These freshwater species markets handle 96% of Kenya's annual fish production of around 175,000 MT. In addition, a fifth set of markets are those related to Kenya's marine capture fisheries (shrimp, tuna, octopus, crab, etc.). Each of those markets is growing with supply generally lagging demand.

Nile Perch: There is a high demand for fish in industrialized markets, in part due to consumers perceiving fish as a healthier product relative to alternatives such as meats from a disease-plagued industry. The demand is especially good for fresh fillets which are seen as both healthy and convenient. This consumer preference finds expression in an FOB price of \$6/kg for chilled versus \$4.5/kg for frozen fillets. Kenya, along with Uganda and Tanzania, is one of the few non-EU countries that can competitively deliver fresh (chilled) fillets according to the exacting specifications of the EU market (e.g., food safety standards, delivery regularity). The broader market potential for Nile perch fillets was further underscored when Kenya, faced with an EU import ban in the late 1990s, could readily find buyers in other markets such as Israel, Australia, the US and Japan, which today combine for more than 40% of sales. However, Kenya's competitive position is undermined by reduced Nile perch landings which resulted from over-fishing and the fishing of undersized fish.

Fresh Tilapia: Fresh tilapia is the preferred and most widely consumed fish product in Kenya. There is no official import competition in this market, but unknown quantities of tilapia (and Nile perch) enter Kenya over water, as Ugandan fisherfolk bringing their catch illegally to Kenyan beaches. The export of tilapia, which also has good markets overseas, is hampered by too low volumes and is also actively discouraged by the Kenyan government who sees tilapia as a key source of protein in the Kenyan diet.

Artisanally Processed Fish: Fried Nile perch skeletons, fried, smoked and sun-dried tilapia, and sun-dried food-grade omena are the dominant processed fish products in the domestic food market. Both the supply and demand of these products are to a large extent driven by the nearly total absence of cooling facilities. Processing is mainly a means to preserve some of the value of these highly perishable products. Competition with imported products in this market is limited to small quantities of smoked tilapia imported from Uganda.

Feed Grade Omena: Typically sun-dried in poor hygienic conditions, a significant volume of the omena is classified as feed-grade quality. This omena still needs to meet certain quality criteria related to for example the maximum percentage of foreign material. It is the main protein, and most expensive, ingredient in feed in Kenya, especially for the large feed manufacturers who set minimum order quantities at 30MT. Unlike the informal 'jua kali' feed manufacturers, these large manufacturers do not use fishmeal made from fish offal because of quality issues, most notably adulteration. Feed-grade omena is not available in sufficient quantities throughout the year, due to resource constraints, regulatory restrictions

¹ Omena is the Kenyan name for Silver Cyprinid, a small, silvery 2-inch fish, unique to its natural habitat Lake Victoria. It is called dagaa in Tanzania and mukene in Uganda.

and a weak supply chain structure. As a result, nearly 80% of the feed-grade omena is imported from Tanzania.

Marine Species: There are readily available and profitable markets for marine fish, crustacean and mollusk species, both domestically (the tourism industry) and internationally. Nevertheless, the landed value represents less than 10% of the potential Ksh5 billion (US\$70 million), mainly because of a local lack of deep sea fishing capacity and an unsupportive government policy.

STRUCTURE OF THE SUB-SECTOR

Fishing: Fishing is done using small wooden boats propelled mostly by sail or paddles and manned by hired crews, and using drift nets, seine nets, and long-lines that are set out overnight. Industrial fishing techniques are banned to protect both the livelihood of the fishing communities and the lake's fish stock levels. There are clear indications that Nile perch has reached its maximum sustainable yield (MSY), and over-fishing in Kenya's shallow lake waters is now reducing the landed volumes. Fisherfolk are forced incur higher costs to go to deeper waters for decreasing quantities of fish caught per trip. Although there are associations and all the beaches have beach management units as part of the government fisheries policy, there is little collaboration between fisherfolk in terms of procurement, fishing or marketing. Government policy further affects fishing through the Fish Act which amongst others establishes minimum catch sizes for Nile perch and a seasonal fishing ban on omena.

Trading & Distribution: The fish catch is sold directly on the beach to various traders. Industrial Fish Processor (IFP) agents buy the Nile perch that meets the processors' criteria (e.g., size, freshness) who take the IFP's ice-laden trucks to the mainland beaches. Lower quality grade Nile perch, tilapia and omena are sold to a number of successive intermediaries along the supply chain: collecting traders, regional traders, wholesalers, and retailers. Most of the retailing takes place in urban open-air markets and through street vendors. Sales of domestic fish products in modern retail outlets such as supermarkets are limited. Grading and the use of ice are minimal in these domestic end-market channels, resulting in high spoilage levels.

Processing: The processing of Nile perch takes place in modern facilities that are fully compliant with the food safety standards of export markets. Fish is filleted, packaged in 6kg labeled cartons and either exported chilled by airplane or frozen by boat, depending on the fish quality and the pertinent orders. In the domestic market, processing is artisanal and varies by the three main fish species. Tilapia is processed only when it is the only way to avoid a total loss of its value due to spoilage. For example, the fisherfolk operating on the more distant lakes sun-dry a large portion of their fish, and fish not sold fast enough in the urban markets is fried and sold as street food. Omena is bought by women traders who immediately sun-dry the fish near the beaches and then take it in bulk to the nearest wholesale markets or regional traders. Nile perch offal (skeletons, skins, etc.) is sold by the IFPs directly to the women who are specialized in processing this raw material (mostly frying). The governance mechanism is such that the women have to buy what the IFP offers to them, independent of what the women can actually sell. Artisanal processing in Kenya uses primitive technologies and takes place with little to no regard for food safety regulations.

GOVERNANCE AND FINANCE IN THE VALUE CHAIN

The following are the salient general aspects of finance in the fisheries value chain in Kenya:

- **Enormous cash flows:** The annual landed value (at ex-vessel price) is estimated at Ksh8 billion (US\$ 100 million) at least half of which is paid out in cash on the beach by the boat owners or boat renters to the fishing crews (hired labor). This has led to a situation that is both inefficient and insecure.
- **“Unbanked” value chain actors (socio-cultural factors):** Value chain actors, especially upstream in the value chain, are characterized by low financial literacy levels and largely operate outside of the formal finance system. The lack of a savings culture is probably the single-most important constraint to growth of the fish value chain. Historically, the fishing communities have shown little interest in saving because of the perception that there is always fish to catch if they need money. Furthermore, the fishermen typically spend a large part of their earnings on alcohol and prostitutes, both of which are in ample supply on the beaches. As a result, HIV/AIDS is wide-spread in the communities along the shores of Lake Victoria, destroying households and creating the most vulnerable and poorest sub-populations in Kenya.
- **Weak financial structure:** Apart from cash transactions, trade credit is wide-spread. Value chain actors are highly dependent on informal sources of finance which are unreliable, inadequate and highly expensive. Options to save money through formal bank accounts are for most fisherfolk a costly and time-consuming boat trip away. In the last few years, commercial banks have begun to develop fish sub-sector specific loan products and to bring them closer to the beaches. While they are clearly changing the dynamics, formal finance institutions face an uphill battle, as they are perceived by most value chain actors as cumbersome and high-risk options.
- **Poor business management skills:** Value chain actors throughout the value chain (with the exception of the IFPs) do not (know how to) use proper costing and pricing methods in their business operation. Financial records are not kept. As a result profitability is likely low or negative, thus effectively blocking growth of the MSMEs.
- **Weak group organization:** Throughout the value, actors behave individualistically. Groups are formed mostly to provide entry points for larger buyers (IFPs) and government and donor programs. There are BMUs on all the beaches and many associations and cooperative societies for fisherfolk, fish traders and fishmongers, but these are weak and badly managed. Especially at the level of the fisherfolk, there are few if any economies of scale and market power is low, leaving them at the mercy of the potentially exploitative practices of the fish traders.
- **Vertical power imbalances (governance):** Overall, vertical power imbalances result from the well-capitalized larger traders initiating a wave of supplier credit that ripples through the value chain and creates buyer dependency (viscous cycles of debt). On the beaches, the imbalance between low fish supplies and many women traders trying to secure these supplies has led to the jaboya system of fish-for-sex whereby the women are forced to pay an “in-kind” premium on top of cash. Vertical power imbalances play out strongly in the Nile perch channel. The dominant players in this value chain are the IFPs who via their buying agents exert market power over the fisherfolk. They also create dependencies by providing equipment on (low-cost) credit to boat owners, which puts the latter in a debt position and locks them in. The greatest dependencies however play out in the artisanal fish processing channel where governance mechanisms keep the small processors of Nile perch offal in a highly dependent position with little or no room for upgrading and growth.

STRATEGIC RECOMMENDATIONS

Given that: (1) the objective is to improve the profitability of the various types of micro-enterprises along the value chain, while simultaneously addressing social constraints and assuring the sustainability of the fisheries resources; (2) domestic and export markets are readily available and growing; (3) supply is severely constrained by biological bottlenecks, regulatory constraints, and inefficiencies throughout the value chain; and (4) the different value chains overlap or face the same challenges; the following are the three key components of the recommended fish value chain upgrading strategy:

(1) Increase the catch of omena, tilapia and marine species; stabilize the catch of Nile perch

- Facilitate and improve access to outboard engines (shift to the deeper waters);
- Work with the BMUs and the fish processors association to enforce the Fish Act (catch size);
- Restock the lake with tilapia fry from improved hatcheries;
- Revise the policy on fishing rights for deep water vessels in the EEZ;
- Align commercial and environmental interests by training fisherfolk.

(2) Reduce losses and operational costs along the value chain (process upgrading)

- Improve cold chain (storage & transportation), packaging materials, transportation logistics, and better communication throughout the value chains;
- Promote the use of appropriate drying technology (drying racks);
- Facilitate a shift from competitive to more collaborative horizontal and vertical governance structures (collective action, contracts).

(3) Strengthen the financial structure

- Develop fish sub-sector specific loan products for asset and working capital finance for fisherfolk, artisanal processors, and traders;
- Bring financial services closer to beach (mobile banking, ATMs);
- Promote a savings culture and provide financial literacy and business management training (pricing and costing skills).

CONCLUSION

This value chain analysis of the Kenya capture fisheries sub-sector illustrates that a myopic focus on particular upgrading activities is unlikely to lead to growth. Strengthening the weak financial structure, reducing power imbalances in the governance structures, and resolving socio-cultural and environmental concerns have to take place concurrently.

For example, the high levels of post-catch losses indicate that the introduction of coolers and improved ice distribution systems would be an upgrade strategy that could stimulate value chain growth. While this could indeed lead to higher profitability at first, without retaining these profits and reinvesting them back in to their business, value chain actors will not be able to grow their business. In addition to a dearth of accessible finance services, exploitative governance mechanisms, and limited business management

skills, socio-cultural aspects of the fishing communities favoring consumption over savings stand in the way of business growth through reinvestment.

Even if the savings rate of fisherfolk, artisanal fish processors and fishmongers improves and they reinvest in their business, growth will be severely hampered if environmental aspects are not taken into account. For example, more boats and more nets could lead to accelerated over-fishing in the shallow waters and a reduction of the overall fish stock. This risk needs to be addressed through a systemic enforcement of environmental protection measures and a diversification strategy that will direct some profits to other high-potential economic activities such as aquaculture or irrigated horticulture.

In the case of the Kenyan fish value-chains, the triple bottom line links the analysis of finance in the value chain to a broader reality that development programs can only ignore at their peril.

1. INTRODUCTION

This study is part of a series of case-studies on the role of finance in value chain analysis and sub-sector growth strategies². It is the outcome of a collaborative effort between two USAID projects: the *Financial Services Knowledge Generation (FSKG)* task order and the *Kenya Access to Rural Finance (KARF)* program. These two projects share the common objective of facilitating the link between market-led value chain development and the needed financial services at various points along the value chain. As part of its ongoing work in Kenya, KARF had identified a need for finance in upgrading activities within the fisheries sub-sector.

Kenya's fisheries resources are important sources of food, employment and foreign exchange. Driven by a 6% GDP growth rate in recent years and changing consumer habits, fish has become an increasingly important part of the Kenyan household's diet, both directly and indirectly (as a key feed ingredient for livestock and dairy). It is estimated that the fishing industry employs over 50,000 fishermen and women, and another 800,000 persons are engaged in fish processing and trade. In addition, fish exports generated US\$50 million in export earnings in 2006.

Analyzing finance in the fisheries value chain provides an interesting case because unlike for example grains, tree crops or vegetables, seasonality issues play less of a role³. The case is also interesting for the complexity of interwoven value chains: fresh and processed fish, industrial and artisanal processing, domestic and export markets, food and feed products.

This case-study will show how a more in-depth analysis of the strongly interlinked finance and governance issues in a value chain leads to a deeper understanding of why stakeholders behave the way they do, a way which at times at first glance may appear to be irrational. For example, we will show why:

- Artisanal fish processors near Kisumu buy Nile perch offals from a processor at considerable expense, only to bury it right away in the ground at a total loss;
- Fish mongers at the Kisumu fish market buy the processed fish from wholesalers at credit with an interest rate of more than 10% (per week) while alternative credit at 2% is readily available;
- Ice plant operators either do not sell ice or sell volumes far below capacity, while at the same time there is a large unmet demand.

It is only after developing this deeper understanding of finance and governance, both within the boundaries of a single firm and between firms in the value chain, that effective development programs can be designed.

In addition, fishing is more than an income generating activity. It also relates to particular communities with unique characteristics and has a direct and intimate bond with water bodies as a natural resource. Hence, throughout the paper we will also discuss how the triple bottom line plays out in Kenya's fisheries sub-sector, i.e., how economic, social and environmental aspects are harmonized or are in conflict.

² Throughout this report we refer to the capture fisheries sub-sector as the collection of distinct value chains that connect the raw material (wild caught fish) to various end-markets. We apply value chain analysis, as a methodology, to the sub-sector as a whole.

³ Seasonality still plays a role due to the cyclical breeding process of the various fish types. However, fish can always be caught throughout the year and so annual cash flow variation is far less stark than for agricultural crop cycles.

The study analyzes both the Lake Victoria freshwater capture fisheries and the marine capture fisheries in Kenya. The main emphasis is on the former as it accounts for 93% of the country's total fish output. A rapid appraisal of the marine capture fisheries is included because this part of the fish sub-sector appears to hold great potential for growth and would likely benefit from similar upgrading strategies. We did not include aquaculture here because this is only an incipient industry at this point and because it would make our analysis too broad.

2. OVERVIEW OF THE FISHERIES SECTOR

The fisheries sub-sector plays a significant role in the Kenyan economy (Table 1). The sector has grown rapidly and exports have generated considerable foreign exchange income. In Kenya, fresh water fish exports from Lake Victoria are currently much higher than marine capture fisheries. Most fishing in Kenya is artisanal, with a little industrial fishing by prawn trawlers. Currently capture fisheries, mainly from Lake Victoria, earn local fishers over Ksh 7 billion, while exports earn the country Ksh 5 billion (US\$ 50 million) in foreign exchange annually.

TABLE 1: FISHERIES ROLE IN KENYA

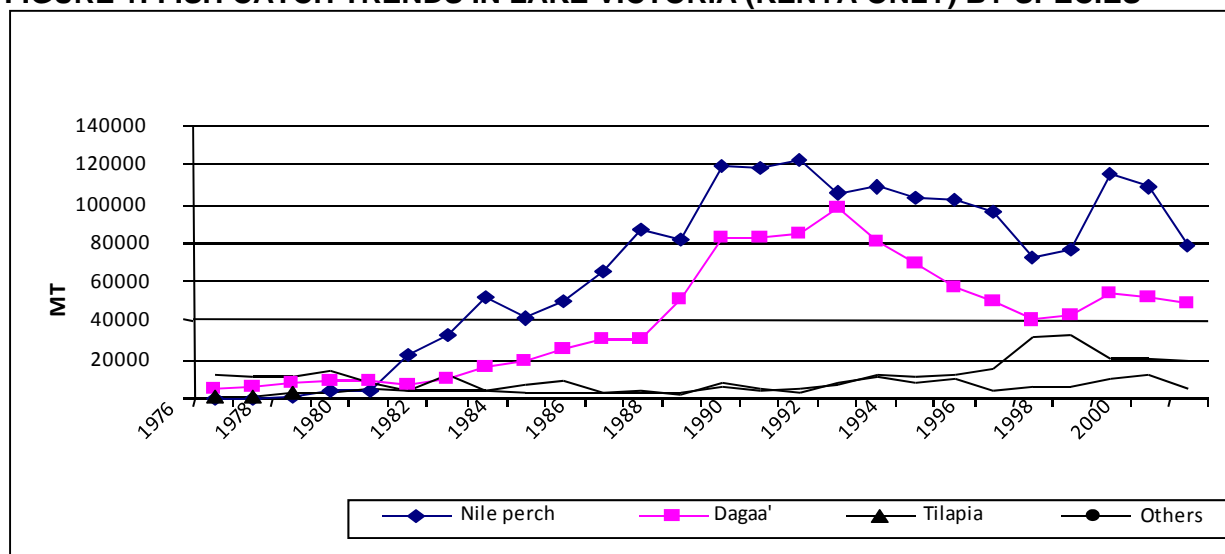
Trade (2005):	Value of Landings (\$)
Value of imports:	US\$ 7 759 000
Value of Exports:	US\$ 49 684 000
Gross value of landings (ex-vessel prices, 2005):	US\$ 104.5 million
Number of Employment.	
Estimated Employment (2006)	63 000
Fishers:	55 000
Fish farmers:	7 800
Secondary sector:	800 000

Source: Fishery Country Profile FAO April 2007

FRESHWATER CAPTURE FISHERIES (LAKE VICTORIA)

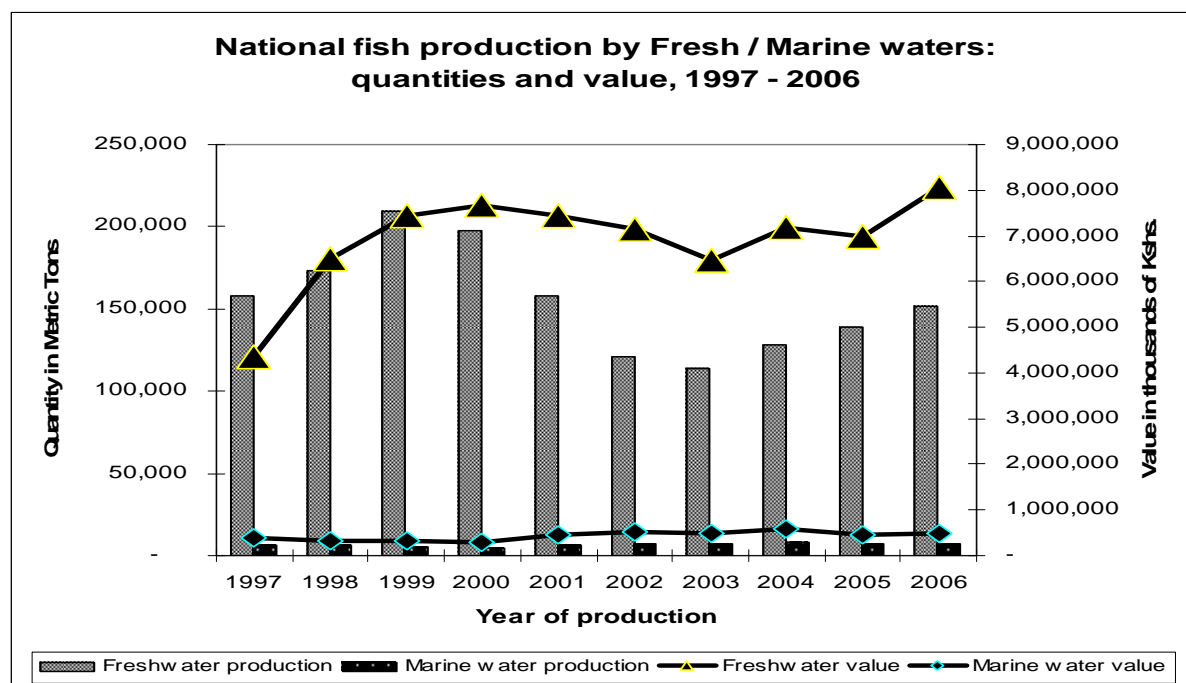
Freshwater fishery accounts for about 96% of Kenya's total fish production, principally from Lake Victoria. Kenya is endowed with extensive inland waters, covering between 10,500 and 11,500 km² depending on rainfall, but it is the country's 6% share of Lake Victoria that accounts for almost all (96%) national freshwater fish production. Lake Victoria has a multi-species fishery of tilapiines and haplochromines, cichlids and more than 20 genera of non-cichlid fish, including Mormyrus, catfish, cyprinids and lungfish. Lake Victoria is the third largest freshwater lake in the World, with an area of 68,000km². However, the lake is relatively shallow, with a maximum depth of 84m and mean depth of just 40m, which makes it quite susceptible to pollution. The area of the lake is divided into the national waters of the bordering countries, with Kenya owning 6%, Uganda 45% and Tanzania 49% of the area. There has been a steady decrease in fish diversity and quantity due to increase in fishing effort as a result of commercialization of fishing in the last two decades (Figure 1, Figure 2).

FIGURE 1: FISH CATCH TRENDS IN LAKE VICTORIA (KENYA ONLY) BY SPECIES



Source: Fisheries Annual Statistical Bulletin 2006 Republic of Kenya Ministry of Livestock and Fisheries Development)

FIGURE 2: QUANTITY AND EX-VESSEL VALUE OF FISH LANDINGS 1987–2006



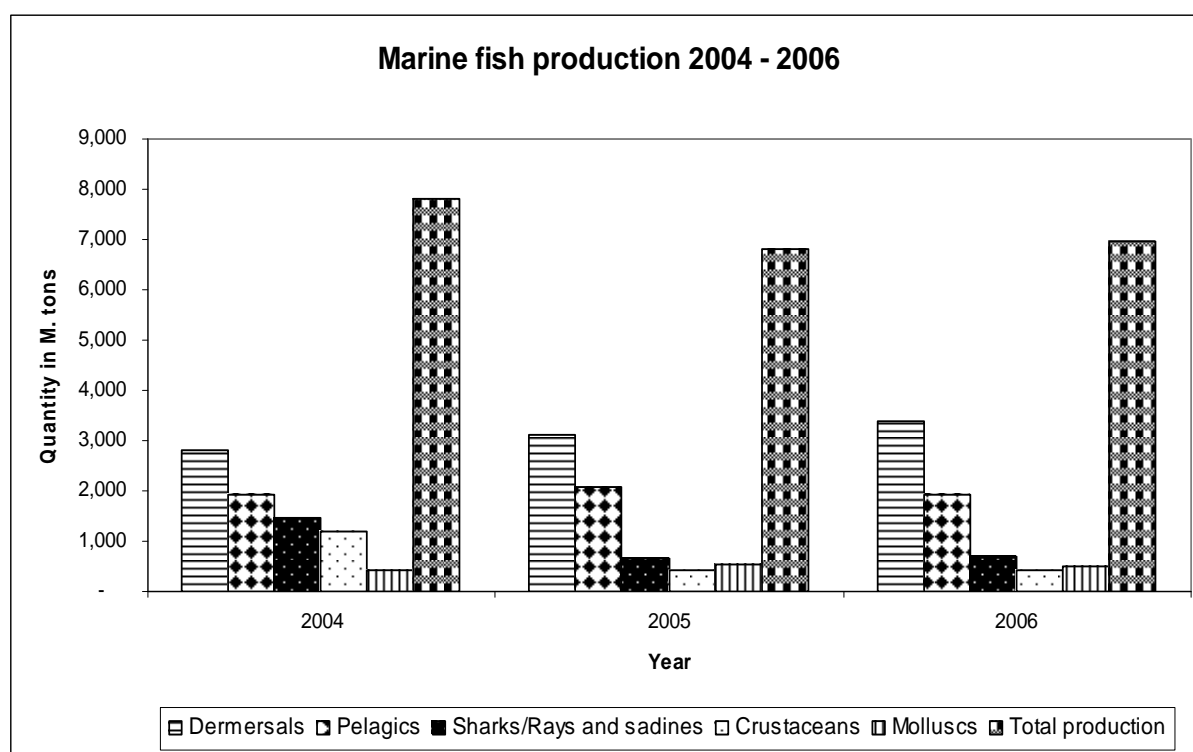
Source: Fisheries Annual Statistical Bulletin 2006, Ministry of Livestock and Fisheries Development, Kenya

MARINE CAPTURE FISHERIES

Kenya has a coastline of the Indian Ocean which stretches for a total length of up to 880 km, and a declared Exclusive Economic Zone (EEZ) of 200 nautical miles, measuring 230,000 km² which includes a narrow continental shelf measuring around 19,000 km² of which about 60% can be trawled. Despite having such vast ocean water frontage with a wide variety of marine fisheries and other resources, an estimated 10,300 fishermen operating along the marine coastline land only about 7,000 MT annually or

about 4% of total national annual production. This is less than 5% of the estimated full potential of around 150,000 MT of marine fisheries per annum. This landed volume comprises marine fish, crustaceans and mollusks valued at between Ksh 350 and 400 million per annum, though reliable expert opinion indicates that the marine fisheries sub-sector has the potential to generate approximately Ksh 5 billion annually or nearly 13 times its current capacity. Over-fishing in inshore area has continued to cause a decline in fish catches, while the deeper territorial waters remain underexploited due to lack of deep sea fishing capacity by the local fishers. The lack of reliable data on catch and numbers of fishers contributes to underestimating the importance of the marine fishery in Kenya and is part of the reason for a poor marine fisheries management program or policy.

FIGURE 3: MARINE FISH PRODUCTION BY SPECIES GROUPS 2004– 2006



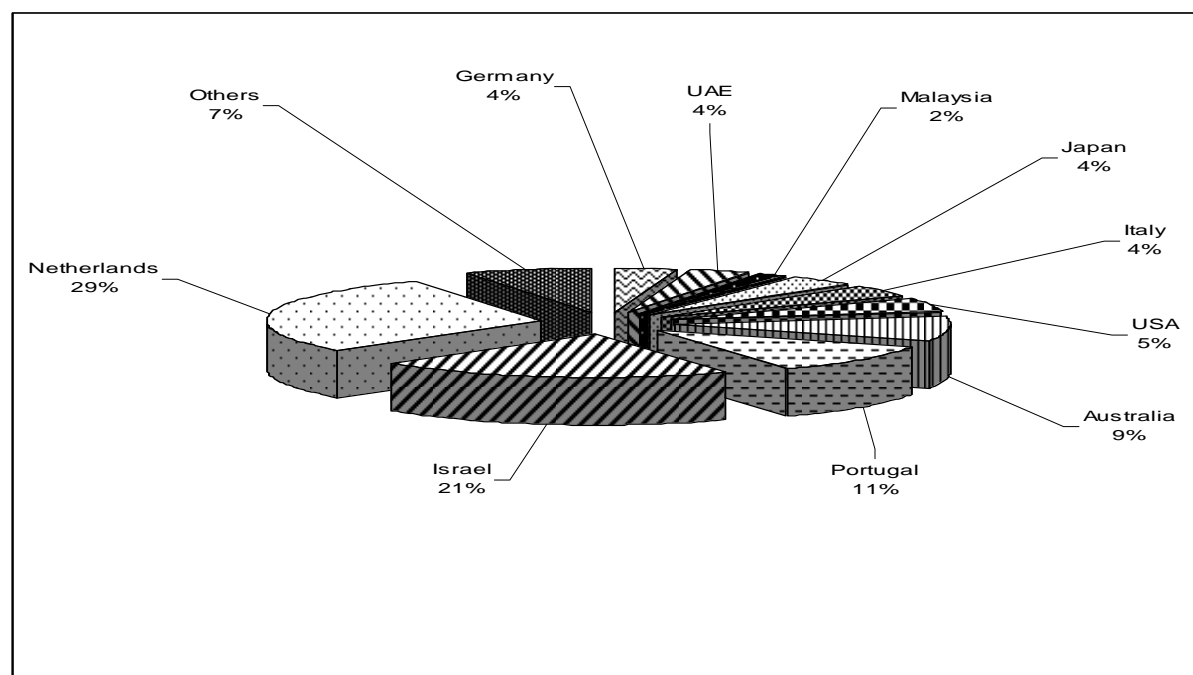
Source: Fisheries Annual Statistical Bulletin 2006, Ministry of Livestock and Fisheries Development. Kenya

3. THE END MARKETS FOR FRESHWATER CAPTURE FISHERIES

3.1. EXPORT MARKETS

Exports of fish are dominated by the export of Nile Perch to the EU (Figure 4). Some analysts believe that Europe's demand for Nile perch was boosted by the outbreak of BSE, or mad cow disease that shifted consumer demand away from red meat. Europe accounts for more than 80% of East Africa's Nile perch market. Export utilization of the Nile perch catches from each country is shown in the following figure.

FIGURE 4: EXPORTS OF NILE PERCH BY DESTINATIONS, 2006



Source: Fisheries Annual Statistical Bulletin 2006, Ministry of Livestock and Fisheries Development, Kenya

In order to evaluate Kenya’s competitiveness of its Nile perch export market share in the EU, it is important to compare and include the exports and landings from Uganda and Tanzania Table 2, Table 3, Figure 5). Understandably, due to Kenya’s relatively smaller fishing right share of Lake Victoria, its quantity caught will be far lower, however comparable trends could be identified such as: (1) declining fish caught, (2) higher value/unit fish potential, (3) trend of differentiation fish products.

TABLE 2: QUANTITY OF NILE PERCH FILLET EXPORTS TO THE EU BY MAIN EXPORTING COUNTRIES (MT)

	1997	1998	1999	2000	2001	2002	203	2004	2005	2006
Kenya	7488	2447	1121	30	2747	3972	5086	6737	5184	4202
Tanzania	9015	12506	4581	26857	23063	23119	26965	30813	23977	23564
Uganda	8621	8894	2731	3451	14776	12213	13062	18539	23808	21179
Total	25124	23846	8433	30338	40586	39303	45113	56089	52968	48945

Source: FISH INFO network Market Report Published in August 2006, FAOSTAT

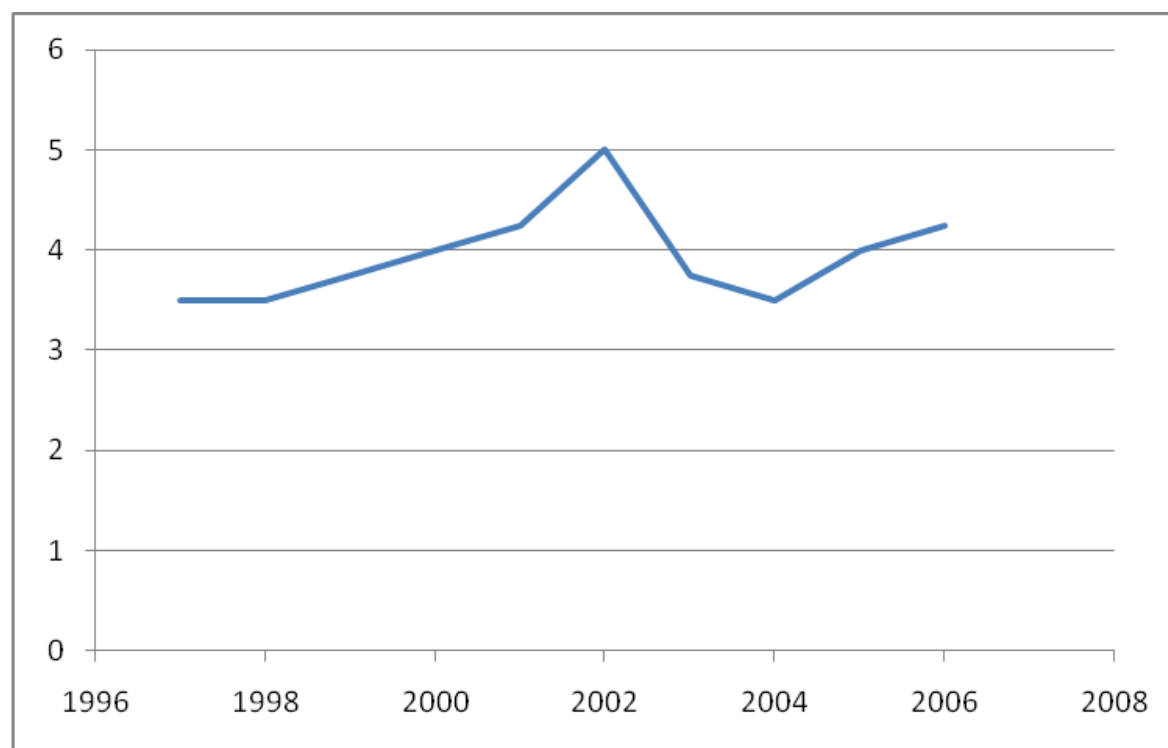
EU imports of Nile perch fillets dropped in 2006, continuing a trend already set in 2005. While Tanzania managed to keep its export levels, Uganda and Kenya reported substantial declines in exports. Spain continues to be the main EU market for Nile perch fillets, followed by France and Italy. However, EU import statistics do not reveal the market size, as all imports are reported at the first entry point into the EU, which is either Belgium or the Netherlands, where the main Nile perch dealers are based. Only in recent years have France and Italy started to import more Nile perch directly, rather than going through Belgium or the Netherlands. During the EU ban on the imports of Nile Perch 1997-2000, Kenya was able to enter new markets during the EU ban such as Dubai, US and Israel.

TABLE 3: VALUE OF NILE PERCH FILLET EXPORTS TO THE EU BY MAIN EXPORTING COUNTRIES ('000 EUROS)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Kenya	26109	6589	4539	125	13062	19375	19134	23433	19117	16211
Tanzania	29491	42899	15699	110667	99170	114235	99701	99510	90045	93181
Uganda	31892	32544	11305	14649	62930	60679	51049	69491	101216	95429
Total	87491	82032	31543	125440	175163	194289	169884	192434	210378	204822

Source: FISH INFO network Market Report Published in August 2006, FAOSTAT

FIGURE 5: UNIT VALUE OF NILE PERCH FILLET IMPORTS INTO THE EU (EURO/KG).



Source: FISH INFO network Market Report Published in August 2006, FAOSTAT

Fish prices shot up by 60% in early 2006 to reach US\$2.00/kg for whole Nile perch at the plant gate. The unit value of fresh Nile perch fillets is obviously higher than the one of frozen products, but not as much as one would expect. In 2002, fresh fillet unit value was \$5.37/kg, while the one of frozen fillet was \$4.1/kg⁴. Tilapia, Nile perch, Panga (Catfish species) are all positioned on the segment for skinless, boneless, white fish fillets. They compete with each other, but in most cases are considered as second choice to wild North Atlantic products (cod and haddock in the UK, cod and grenadier in France, etc.).

The main product imported into the EU continues to be fresh fillets. This product accounts for 76% of total quantity and 78% of total value. However, the relative shares of this product declined in 2006, due to the higher frozen fillet from Tanzania and Kenya. However, it has been noted that the future outlook for

⁴ Nile Perch Market Report - April 2005 EUROSTAT

exports of Nile Perch will face increasing pressure from cheaper produced fresh white fish fillets pangasius (catfish species) trade with its origin from Vietnam. (Anova the main fish whole sale trader in EU indicated their interest in increasing the Pangasius trade)

3.2. THE DOMESTIC MARKET

Fish for Food Market

The other species that are caught in the Lake Victoria are tilapia and omena, which primarily serve the domestic market. Interviews with processors indicated that due to low supply of tilapia, no export of Tilapia is taking place. The fisheries products consumed in Kenya consist of:

- Dried omena
- Fresh, sun-dried, or smoked tilapia
- By-products of Nile perch (artisanal processed)

Domestic consumption of fish in Kenya has increased in the last years. Prices are as high as Ksh 140/US\$ 1.86 per kg and there is consumer awareness of the health benefits of eating fish as well.

Fish for Feed Market

Fish also provides raw material (fishmeal) for producing animal feeds for the growing livestock and dairy markets in Kenya. A fishmeal industry was established in Kenya in the mid 1990s. Fishmeal is the protein ingredient in processing of animal feeds. The main inputs in the fishmeal industry are low-quality grade omena and Nile perch by-products (mainly fish frames after fillet removal). In this way the fish subsector plays a significant forward linkage role in providing inputs to the animal feeds industry, especially the beef, dairy, and poultry sub-sectors.

Fish Imports

During 2006 fish and fishery products imports value amounted to Kshs.8,426,000. These imports included tuna, tropical live fish, salmon, fish eggs, and sea food. Imports in 2006 involved some 18,460 pieces of live fish, 150,000 fish eggs, 1,790 cartons and 11,778 Kg of canned tuna, 12,090 Kg of salmon, and 4,790 Kg of sea food. Import figures are usually not totally accurate because much crosses the borders without any records.

4. VALUE CHAIN ACTORS AND FUNCTIONS FOR THE FRESHWATER CAPTURE FISHERIES

4.1. FISHING

Nile Perch: Most of the fish are caught from small canoes, using either paddle or outboard power. Typically fishermen will use drift nets, set overnight, although some fish is also caught with baited long-lines. Industrial fishing techniques are banned. The national fishers survey for 2002 shows a substantial increase in the fishing effort, but at the end of a day a fisher comes back home with less Nile perch than before. A fisherman is now forced by circumstances to invest more in terms of fishing effort and has to fish in more distant places compared to the end of the 1990s.⁵ That means that Nile perch harvesting costs

⁵ The Frame survey data indicated that fishing effort increased substantially between 2000 and 2006. The number of fishers increased by 52%, from 129,305 to 196,426; Number of fishing crafts increased by 63% from 42,493 to 69,160; Number of fishing crafts using outboard engines increased in 211% overall. This suggests that the fishers are going farther in search of fish. Over

are higher compared to past years. In response to the dwindling supply of the Nile Perch species, and the concomitant competition for fish some industrial processing factories adopted various strategies including; provision of credit, nets and fishing gears to fishers through their agents; building of bandas, storage facilities and even jetties at the landing beaches in order to create leverage in the emerging competitive market atmosphere.

Tilapia-Omena: To catch the Tilapia fish species, the fishermen use the same technology as the Nile Perch which involves the use of long fishing lines or gill nets. The fishermen normally sell the fish to wholesale traders at the landing sites, who then transport the fish to various local and regional in trucks stacked with ice. For markets in the lake region, transporters use pick-ups. For the more distant regional markets such as Nairobi and Mombasa, large wholesale traders use trucks with varying carrying capacities of 4-7 tons with fish covered with ice flakes for preservation. Omena is considered underexploited as the current biomass is probably greater than 50% of unexploited biomass. Tilapia lack long term series data but appear to be fully exploited. It is proposed to prohibit fishing within 200m of the lake shore to create a buffer within which to monitor Nile tilapia

4.2. GRADING AND COLD CHAIN TRANSPORTATION

Nile Perch: Fishermen usually land their catch at numerous small landing sites on the shore or off-lying islands, where they are bought by traders or directly by processors agents for onward road transport to the factory or market. Prices are negotiated based on subjective quality assessment by the trader. There is limited use of ice by fishermen in the boats and on the landing sites. Ice is usually provided by the IFPs (Industrial Fish Processors) to the agents or traders. Conditions at beach landing sites are poor, lacking potable water supply, clean trading areas and toilets. The price for Nile perch at the landing station or at beach level is not determined by fishermen but by traders (or IFP agents). Factors such as transportation costs, availability of transportation vessel or vehicles at the time of landing will automatically influence the prices at this level. The growth of an individual fishers operation is constrained by the fact that they have no preservation facilities and therefore delay in sale would result in low quality fish, which results in lower prices.

Tilapia and Omena: Tilapia and Omena is used for human consumption and animal feed. There is little grading done and the cold chain transportation consist of transporting fish in woven baskets with minimal ice use. Fish is mainly transported from Kisumu areas to Nairobi wholesale markets using public transportation. Most of the traders have indicated that whole sale price and transportation costs have increased, subsequently requiring higher amounts of working capital. Scarcity of Omena due to closed seasons forced traders to go to Tanzania for supply.

4.3. PROCESSING (& EXPORT)

Although Kenya owns the smallest part of the lake, the country has been instrumental in developing the processing and export activity, and both Ugandan and Tanzanian fishermen have historically landed their catches in and around Kisumu, which is the Kenyan centre of the Nile perch industry. Here there are 12 operating factories (although some fish is also processed in Nairobi and even Mombasa). Recently however, both Uganda (with 12 factories at Entebbe, Kampala and Jinja) and Tanzania (with 10 factories around Mwanza) have both developed a processing capability. The processors have formed strong national associations to represent their members. At the processing factories, most of which meet

the same period, the total number of gillnets also increased by 88%, from 650,653 in 2000 to 1,222,307 in 2006 and longline hooks by 61% from 3,496,247 to 9,044,550 hooks respectively.

standards of design and construction specified in the EU hygiene directive (91/493/EEC), the fish are washed and sorted. They are chilled and kept in ice until ready for processing (up to one day). The fish are then filleted by hand without gutting and the fillets then skinned and trimmed. The skinning is usually done by hand as well, although some processors have installed mechanical skinners.

Nile Perch

Frozen Fillets: Sizes vary, from 300g to 1500g. Large fillets above 1500g are portioned and are always frozen, since the premium fresh markets do not accept very high oil content. The oil content of the flesh increases with size of fish, and ranges from 4 up to 20% in fish over 50kg.

Individual fillets and portions are packed in polythene. The fish is packed immediately into waxed cartons of 6kg or 10kg depending on the market and then blast frozen. Some factories have recently installed plate freezers to achieve a more rapid freezing of fillets. There is some production of headed and gutted fish and steaks, but these form only a small proportion of the total. Frozen fish is transported to Mombasa in refrigerated trucks (including all frozen fish from Uganda and some from Tanzania), and exports by sea are exclusively by container.

Fresh Chilled Fillets: Exports of fresh chilled Nile perch have developed over the last years. As with most fish from tropical waters, if well handled, it has a long shelf-life - up to 27 days on ice. For exports of fresh fillets, the cartons are held in a chill store until the consignment is ready for dispatch, then packed into polystyrene boxes. These are transported to Nairobi or Entebbe in time for late evening flights to Europe. In addition, there are direct charter flights (for example twice weekly from Mwanza to EU destinations, carrying 50 tons of fish each time). The cost of air freight to the European market is in the range of US\$1.50 to 2.0 per kg, which is more than recovered in the premium over frozen fish (where the freight cost is in the region of US\$0.50/kg).

Byproducts: Many of the by-products of processing are also utilized.

- The swim-bladders (maws) are sun-dried and find ready export markets in the Far East.
- Belly flaps (with their high oil content) and visceral fat can be rendered to produce high quality fish oil.
- Fish leather skins; in the last five years, a small tanning industry has developed in Kenya, producing high quality leather goods from the skins.⁶
- Fillet frames are sold on the local market, where they are fried and sold for consumption by street traders.
- There is also some artisanal processing of Nile perch employing smoke-drying over wood fires to confer a degree of preservation for distribution to interior markets.

Tilapia and Omena: Tilapia that cannot be sold fresh at the markets are processed as salted smoked or dried. Omena is usually dried at the surrounding areas of the landing sites and is not sold fresh. The processing is done very primitively with little food safety regulations.

⁶ The skinning process adopted depends on the market. The Northern European, American and Australian markets require a deep skinned fillet (30% yield), so as to remove completely the layer of subcutaneous fat. All dark flesh and pin-bones are also removed. Southern European markets (Spain and Greece) prefer a higher yield (35%) fillet, which is not so heavily trimmed (with pin-bone in) and has a lower price. The Israeli market allows for a much higher yield (40%), which leaves a portion of the skin attached. The Japanese market demands a skin-on scaled fillet (in which case the yield is 42%).

4.4. WHOLESALE TRADE

Nile Perch. The final market segment is the export market. Usually, fish is sold in bulk to EU importers. They in turn sell the fish to wholesalers, supermarkets, processors, etc. The fillets are also re-exported straight away (with the same or different identity). There are companies or consignors based in the European Union that are major importers of Nile perch fillets and trade the same product to other destinations such as USA, Australia and South America. Fillets are also sold to factories for further processing.

Tilapia and Omena. Tilapia and Omena fish products are usually sold in the wholesale markets such as Gikomba in Nairobi and Kongowea in Mombasa. For the smaller to medium wholesale trader aiming to sell in the more distant regional markets fish is packed the supplies in baskets (made of papyrus leaves) also stacked with ice flakes, hire pickups (sometimes jointly with others) and transport the fish from the landing sites to major towns in the lake region such as Kisumu and Homa Bay. Small and medium Tilapia traders sell the product in either of two ways. One, as whole fresh fish to household consumers or fillet to institutional consumers; and as smoked which is then deep fried for vending to individual consumers around various points in the main towns. In Nairobi, common places where such vending is to be found includes Nairobi West, Kibera, Kenyatta market, Kariobangi and others.

4.5. RETAIL TRADE

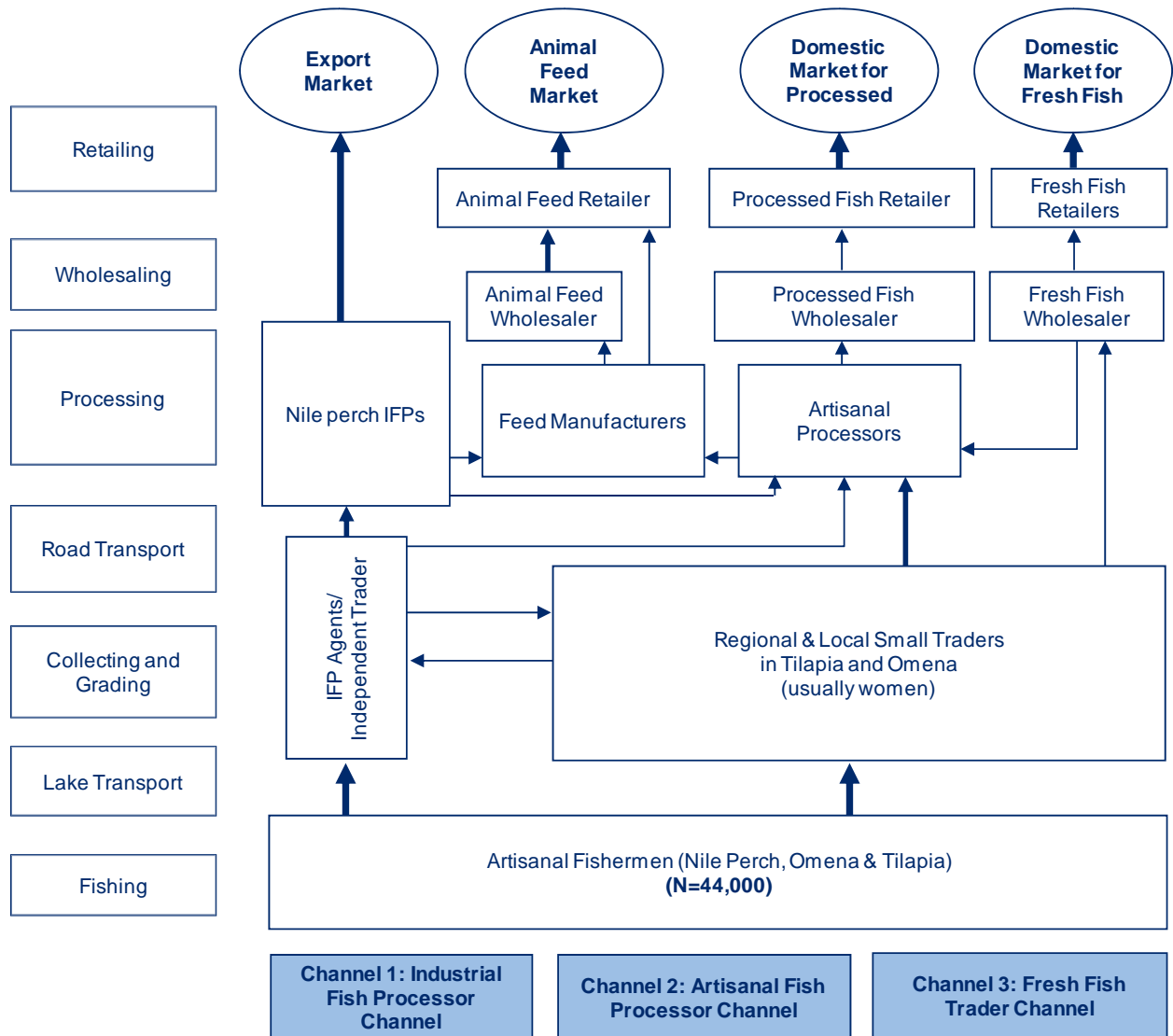
Nile Perch: Nile Perch retail prices in the EU compare favorably with other white fish fillets, such as cod and haddock, which is the main reason for the appeal of the product. On the retail level: during discount price campaigns Nile Perch is sold at circa 7.35\$/kg and Pangasius (catfish species) at less than 6.3\$/kg. Providing that present quality problems can be overcome (see below) this trend is likely to continue, since there is a clear demand, especially from the supermarket sector, for the fresh fish fillets. Imports of dressed fish and ready to cook or eat also appear to be on the increase, suggesting a developing use amongst secondary processors and caterers.

Tilapia and Omena: Some dried fish products are sold in supermarkets or other smaller retail outlets.

5. SUB-SECTOR MAPS AND DISTINCT SUPPLY CHANNELS

5.1. LAKE VICTORIA CAPTURE FISHERIES

FIGURE 6: LAKE VICTORIA CAPTURE FISHERIES SUB-SECTOR MAP



Channel 1 Industrial Fish Processing (IFPs)

The IFPs operates a fairly integrated channel in Nile Perch fish Value Chain. The channel comprises of collection and transportation through their accredited agents, processing, packaging, wholesaling and exports and can be considered as a directed channel. The agents contracted by the IFPs, buy and collect fish from the landing sites using cooler trucks loaded with ice. As competition has increased with the decline in Nile Perch supplies from the lake, the IFPs and their agents have become more innovative sometimes in the form of providing credit/cash advances to purchase fish, fishing nets, supply fishing gears, and engines to clients with whom they have well established trade relationships. The repayment of

such embedded in kind credit is normally done within an agreed time frame with deductions occurring at every time of fish delivery.

Channel 2 Artisanal Fish Processing

These channels constitute of small family or women-owned business enterprises with low technologies of processing and are located close to the beaches and areas of towns around the lake. The main types of fish and fish products being processed are:

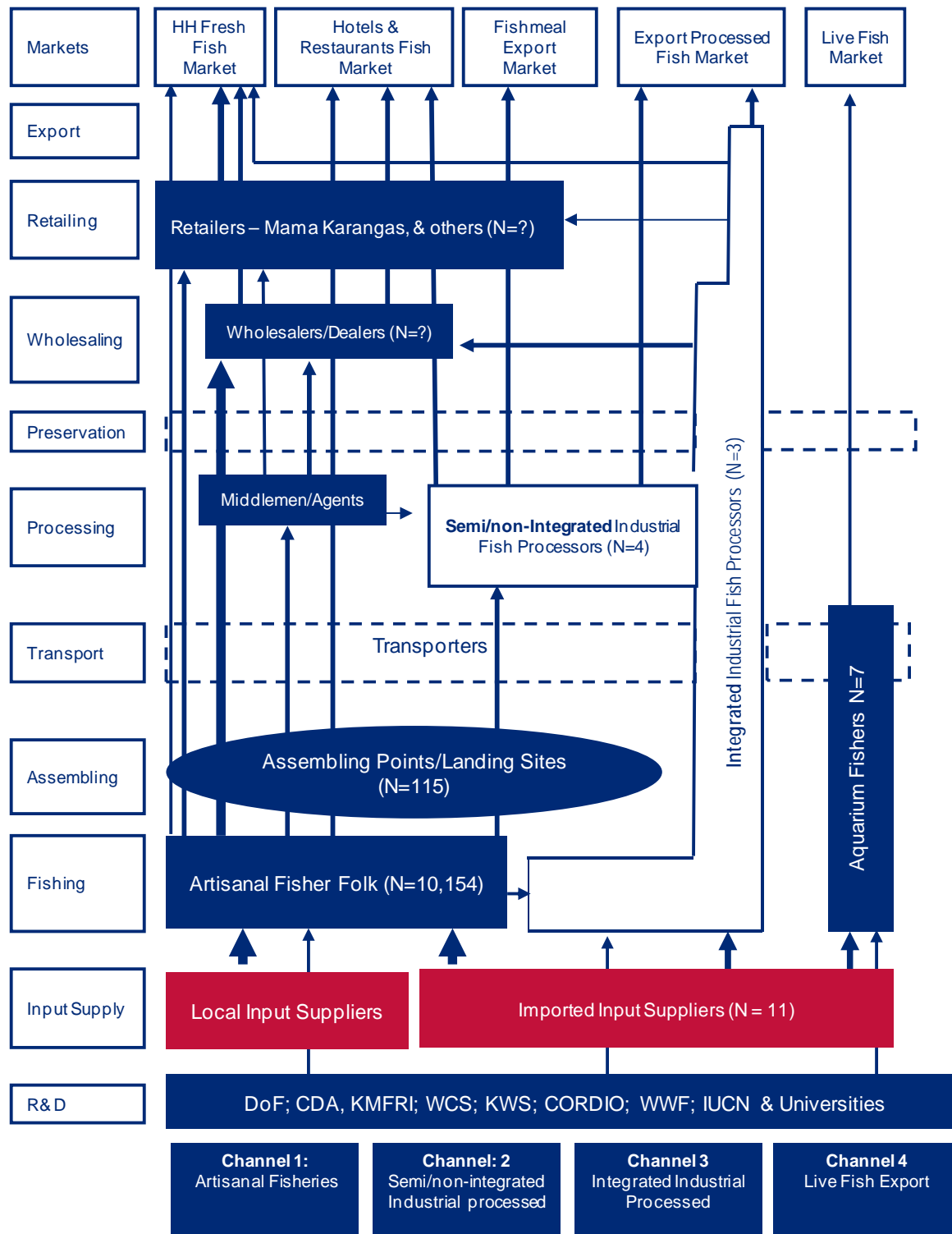
- The Omena species which is processed by way of sun-drying for human consumption, and more recently for the animal feed fishmeal market. The supplies come directly from fishermen who sell the catch to traders around the beaches, with over 95% being women. The human consumption market for Omena has been more lucrative (but with excess supplies from Tanzania and Uganda which are not observing closed fishing seasons); the bulk of Omena fish is currently being diverted to the animal fish meal industry.
- Nile Perch whole fish rejects and by-products whose processing involves deep frying of the frame and the off-cuts (using fish skins as cooking fuel and fat for frying) mainly for human consumption. The by-products come from the IFPs through traders or artisanal processors themselves who buy from the IFP factories, while the whole fish rejects often come from IFP agents and to a lesser extent the fisher folks.
- Tilapia species which is smoked after the guts have been removed. The source is often the wholesale traders who purchase the fish from fishermen at the landing sites. Sales for this product are mainly targeted at the low income consumers in various local and regional urban centers in the country.

Channel 3 Fresh Fish Trader Channel

The channel represents the Tilapia species which is the only species from the lake that is partly consumed fresh and partly as smoked. The products are then loaded onto long distance commuter buses for deliver to the target regional markets for onward sale to traders or other small to medium scale traders. Women are exclusively the dealers in this type of business.

5.2 MARINE CAPTURE FISHERIES

FIGURE 7: MARINE CAPTURE FISHERIES SUB-SECTOR MAP



Source: Value Chain Market Assessment for Marine Fish Subsector in Kenya's Coast Region (April 2007)

Rapid Assessment of the Marine Fisheries Value Chain

Main channels of production:

- Artisanal fishing activities are undertaken by more than 10,000 fishers, of which 9 600 are boat fishers using 2 400 boats and 675 are foot fisher⁷,
- Shrimp trawling is carried out in the territorial waters by industrial sea trawlers (estimated at 5)⁸, which fish for shrimp, although they also harvest large quantities of by-catch, some of which is discarded. Most of the finfish caught by trawlers as by-catch and those harvested by small-scale fishers, are consumed locally, while shrimp is exported. Shrimp fishing within the legal 5 miles of the coast from the shore, which has been on-going for the last 4 years, is currently banned, as a result of resource user conflicts. The government and other stakeholders are looking into ways of resolving the conflicts by using the data collected to arrive at a sustainable fishing regime acceptable to all stakeholders.
- The offshore fishing in Kenya's EEZ is dominated by Distant Water Foreign fleets (estimated at 33 purse seiners and 30 long-liners). These foreign vessels are licensed by the Kenyan government and are not required to land their catches in Kenya. There has been steady increase in the number of licensed vessels since 2003, when the government took a keen interest in illegal fishing and occasionally used the Kenya Navy to patrol the EEZ, indicating the profitable potential fisheries present in these zones.

The current low level of exploitation of the existing potential is largely explained by two main factors. Firstly, the part-time and subsistence nature of artisanal fishing in most parts of the shoreline, as the fishermen tend to split their time between tourist-related activities, farming and fishing. Secondly, lack of appropriate boats for deep sea fishing where fishery resources are believed to be more abundant and are only being exploited by foreign vessels with little benefits to the Kenyan economy. Given the location of Kenya's marine waters within the tuna-rich section of the South West Indian Ocean (within the regions yellow-fin tuna belt), tuna presents the richest single-species fishery potential in the country. Yellow fin, big eye and skipjack tuna has the potential to be the driving force in the country's marine fishery in a manner similar to the Nile Perch fishery of Lake Victoria. Currently, artisanal fishery at the coast lands about 280 MT of Tuna annually, while Wananchi Company Ltd which undertakes processing on behalf of EU fishing vessels, is receiving over about 10,000 MT annually from off-shore foreign fishers for value addition. According to findings by a recent marine fish subsector study (April 2007), this company requires even more and is willing to provide market outlet for the artisanal fisher folks for an amount equivalent to 36,000 MT per year.

6. INSTITUTIONAL, REGULATORY AND SUPPORTING ENVIRONMENT

The main institution responsible for fisheries management is the Fisheries Department, and for research it is KMFRI. The major stakeholders include research institutions, training institutions, fishers, traders, processors, conservationists, environmentalists, public health agencies and nongovernmental organizations (NGOs). The main fishery legal framework is contained in the Fisheries Act, Chapter 378 of the Laws of Kenya, whose Principal Law covers six areas⁹:

⁷ According to the 2006 Kenya Marine Frame Survey.

⁸ Sort and packing, IQF freezing is done on the trawlers while at sea

⁹ (1) Preliminary; and Interpretation.(2) Administration: Fisheries development measures; and Fisheries management measures. (3) Registration of local fishing vessels.(4) Licensing provisions: General licensing provisions; Fishing and entry into Kenya fishery

6.1. FISHERIES POLICY

There is strong evidence that Nile perch is being over-fished. The average size of landed fish has declined from over 50kg in 1980 to less than 10kg in 1996. Catch rates are also reported to be in decline. Fisheries scientists believe that the Nile perch fishery is being sustained only by cannibalism of the young fish. Despite the attempts of several aid donors, there is still no systematic approach to the management of the fishery, which by definition will require the active support and collaboration of the three nations. There is a critical lack of information about the fishery (e.g. numbers of boats, fishing gear, landings and utilization of the catch) which would be the first step in establishing a management system.

Lake Victoria Fisheries Management

Several environmental problems could adversely affect the fishery in the future. Development around the lake shore has caused increased pollution through agricultural, sewage and industrial effluents. Deforestation of the lake margins (to provide domestic cooking fuel) increases topsoil erosion and silting. In recent years there has been an explosion of water hyacinth, cutting off sunlight and oxygen to the water below and causing difficulties for shipping and fishing. Algal blooms occur, resulting in local de-oxygenation and fish kills. Environmental pressures on the Lake are tremendous and so far all efforts to manage both their causes and effects have proved fruitless.

Marine Fishing Regulation

Management and focus on Kenya's marine resources is continuously being enhanced. Kenya has become a member of the South West Indian Ocean Organization (SWIO), a regional body involved in the management of the non-tuna fish species in the high seas of the Indian Ocean. In 2004 Kenya joined the Indian Ocean Tuna Commission (IOTC), the competent Fisheries Authority in tuna fishing utilization and management. Membership to IOTC ensures that Kenya participates in fish stock assessment and share fishing, management and scientific information with other member countries. The country will also participate in decision-making through voting on important issues concerning the management and utilization of the tuna. Membership to these regional fisheries bodies and strengthening of monitoring, control and surveillance (MCS) will ensure reduced Illegal, Unreported and Unregulated (IUU) fishing and increase revenue accrued from vessels utilizing Kenya's EEZ.

Kenya Fishing Bans (Omena)

The ban on fishing and trading omena (*Rastrineobola argentea*) was implemented in 2001 in order to conserve vulnerable stocks during the peak breeding period and reduce the overall effort on this fishery. The ban was published in the Kenya Gazette Notice No.7565-The Fisheries Act (Cap 378) – Imposition of Management Measures- gave notice that fishing *Rastrineobola argentea* (Omena) in Kenya waters of Lake Victoria during the period from 1st April to 31st July each year is prohibited and the respective periods wherever specified, shall be closed seasons or areas for purposes of this notice.

Licensing (Fisherfolk, Traders)

Section 8 of the Fisheries Act (Cap 378 of 1991) provides that no person other than persons fishing for their own consumption shall catch or assist in catching fish in Kenya fishery waters otherwise than in accordance with the terms and conditions of a valid license issued to him under the above Act. The

waters by foreign fishing vessels; and Foreign vessels fishing licenses. (5) Offences and Enforcement: Prohibited methods of fishing; Powers of officers; Forfeiture; and Compounding of offences. (6) General Provisions: Conduct of prosecutions; Marine mammals; and Minister's power to make regulations. The Act has provisions to make binding and enforceable Regulations through published Legal and Gazette notices.

Fisheries (General) Regulations 15 (1) provides that no person shall trade in fish or fish products unless he is in lawful possession of a fish traders license issued under this regulation and is operating on conformity with the terms and conditions of the license.

6.2. SUPPORTING ORGANIZATIONS

The fish subsector around Lake Victoria is supported or regulated by several national, regional/local level and international institutions. National level institutions are listed below (Table 4).

TABLE 4: INSTITUTIONS SUPPORTING THE FISHING SUB-SECTOR IN KENYA

Public Support Organizations	
Kenya Bureau of Standards	KEBS is responsible for metrology, standardization, and testing and quality management issues in Kenya. The aims and objectives of KEBS include preparation of standards relating to products, measurements, materials, processes, and their promotion; certification; assistance in the production of quality products; improvement of measurements accuracies and dissemination of information relating to standards. As regards fish, the KEBS undertakes microbiological laboratory testing for fish and fishery products.
Kenya Fish Processors and Exporters Association (AFIPEK)	AFIPEK, which was established in the year 2000, is a professional association of the fish subsector with membership drawn from processors and exporters of fish and fishery products from Kenya. All fish processing/exporting companies are members of the Kenya Fish Processors and Exporters Association (AFIPEK). It is coordinated through a secretariat based in Nairobi which serves the various members located in Kisumu, Nairobi and Mombasa.
Kenya Marine Fisheries and Research Institute (KMFRI)	This the institution specifically charged with conducting research on fisheries and general aquatic systems in Kenya. KMFRI conducts research in six broad areas, namely; fisheries biology (stock and catch assessment, fish production, genetics and breeding etc.), aquaculture (pond construction, stocking, reproduction, feed formulation etc.), aquatic environment (water quality, pollution etc.), fisheries socio-economic (fisheries development, management, livelihoods etc.), fish quality and post-harvest fish technology (fish quality standards, fisheries products development etc.), and fisheries database management (fisheries statistics, data management etc. The main beneficiaries of KMFRI's research are the Department of Fisheries, IFPs, artisanal processors and traders and fishermen.
Lake Victoria Fisheries Organization (LVFO)	The LVFO is a regional organization whose objectives are to foster co-operation among the supporting parties (Kenya, Uganda and Tanzanian governments); harmonize national measures for the sustainable utilization of the resources of Lake Victoria; and to develop and adopt conservation and management measures to assure the lake's ecosystem health and sustainability of the living resources. Its secretariat is based in Jinja (Uganda). Its responsibilities include: Promoting the proper management and optimum utilization of the fisheries resources of the lake, enhancing capacity building of existing institutions and develop new ones, and provide a forum for discussions of the impacts of initiatives dealing with the environment and water quality in the lake basin and maintain liaison with existing bodies and programmes among others.
Lake Victoria Fisheries Research Project (LVFRP)	The LVFRP was funded by the EU with a total budget of approximately EURO 9.3 million. The first phase of the project started in 1989, initially scheduled to run for a period of one-and-a-half years. The first phase principally focused on the rehabilitation of the existing research vessels in Kenya and Uganda and to construct a new one in Tanzania. Phase II of the project commenced in 1997 and was scheduled to end in 2002. The objective of this phase was to create a viable regional fisheries management framework and the creation of the knowledge basis required for the regional management of the lake fisheries.

OSIENALA	(Also referred to as Friends of Lake Victoria) is a national NGO registered in Kenya in 1992 and currently operates mainly in Nyanza and Western Provinces. The main objectives of the NGO are to create environmental awareness for the conservation and protection of Lake Victoria and its catchment area from further degradation; to serve as a forum for exchange and expression of the views on environmental matters in the lake; provide necessary training to community members involved in reducing environmental degradation around the lake region; to encourage and carry out research in relevant areas of environment with the aim of finding practical and sustainable solutions; to establish and maintain a resource center on matters and issues relating to the lake for purposes of improving the knowledge base of the community around it; and to articulate the views, concerns and aspiration of the lake resources stakeholders through the establishment of collaborative linkages with similar organizations with the aim of harmonizing issues related to the lake for the purpose of exploiting the resources judiciously.
Young Women Christian Association	This is a national organization of young Christian women whose corporate vision is to build a society where girls and women are able to fully exploit their potential. The association mobilizes women to participate in development activities by assisting them to raise funds, manage the investments (e.g., hostels and conference halls etc.). The organization's program focus is on capacity building through integrated Youth and Women development programs whose aim is to improve the living standards by providing training in leadership, training in business and credit management skills, vocational skills and exchange programs. The organization is also involved in youth issues (reproductive health/HIV Aids); economic empowerment, advocacy and awareness on topical issues, and water and environment issues.
IUCN	The IUCN contributes to Kenyan fisheries mainly through its program on socio-economics of Lake Victoria fisheries, which is implemented in collaboration with government research institutions and local NGOs in Kenya, Uganda and Tanzania. The program promotes involvement of the local community in management. The objectives of the project include: understanding the socio-economic conditions of various stakeholders and building capacity of the stakeholders to manage the fisheries in a sustainable manner. At the international level, the main institutions currently providing support to the fisheries sector around the lake and the country as whole include FAO and IUCN
Community Based Organizations	
Beach Management Units (BMUs)	Currently, these are the most active and effective of the Community Based Organizations. They are present at all designated landing sites. Each BMU committee is made up of 5 to 9 persons, about half of whom are elected by the local fishing community while the rest are nominated. BMUs are independent of government and lack legal authority. They are maintained through a levy of 1 Ksh/kg imposed on all the landed fish catch. They have been found to be highly accountable to their communities and to be effective. The functions of the BMUs include resolving conflict, punishing offenders, convening community meetings, establishing beach hygiene and sanitation facilities, providing security on the beach and in the fishing ground, receiving visitors, registering beach members, facilitating search and rescue, and the establishment and maintenance of beach infrastructure. Since members of these units come from the community, it can be easily recognized when the BMU's have failed to deliver according to the community's expectations.
Fishermen Associations	During 1950s, fishing was managed under loose community based associations often under an existing clan constitution within the framework of traditional structures. Some fishermen have remained as members of both though many

	<p>are inclined to market under the Associations. By 2002, there were only 35 active cooperative societies with approximately 7,900 members with Kisumu, Suba and Migori accounting for about 73% of the membership. In every beach, a beach leader supported by a committee of 5 to 9 people is appointed by the community to ensure fishing is undertaken in compliance with the laid down rules and regulations, promote peace and security at the beach, resolve conflicts, receive and approves immigrants. The committee intermediates between the community and the Fisheries Department, although the committee is not recognized in the Fisheries Act.</p>
<p>Fishermen Co-operative Societies</p>	<p>In most fishing clusters, fishermen have formed cooperative societies which are responsible for marketing fish for their members as well as ensuring that member's interests are protected. Unfortunately, these cooperatives are often ineffective and most members tend to evade marketing through them. There are about 46 fishermen co-operative societies around the Lake Victoria districts alone. They operate under the authority of the co-operative societies act. Their functions include providing fishing gears, material for boat maintenance, fuel, fish transport, fish preservation facilities and organized marketing. Just like all the cooperative circles in Kenya, most of these cooperatives have not been doing well and to survive, some of them are dabbling in providing banking services.</p>

7. VALUE CHAIN DYNAMICS

Key drivers and bottlenecks that affect changes in the sub-sector are:

Preserving the sustainability of the Nile Perch fisheries: Even with the current fisheries management program and the establishment of the active BMUs, there is a need to increase efforts to preserve the sustainability of the Lake Victoria Nile Perch fisheries. Some efforts have started the process of certification, which would lead to stronger pressure to comply with regulations and improve the image of Lake Victoria Nile Perch products. Anova, a leading supplier of Nile Perch in Europe and America, has taken many initiatives to increase the social and environmental standards and have commenced application procedures for Naturland Certification. Anova, Vicfish and the German GTZ, funded a project with the aim to build capacity for eco-labeling in the region and to certify the artisanal Nile Perch fisheries according to Naturland standards,

Increased EU consumer food safety requirements: The EU ban during 1997-2000, resulted in a heightened level of applied HACCP in most fish processing plants; however these regulations are not applied at the level of the fishermen and traders. For fishermen to adopt new fishing practices, added benefits resulting from applying Best Management Practices will have to trickle down to fishermen. 1) Fish quality, as expected internationally, is guaranteed by the processing industry through adopting new quality guidance techniques. It is based on a strong selection of the quality of the fish that is purchased at the factory gate. There is insufficient quality control in this upstream part of the fish chain. Examples of the absence of quality monitoring in the upstream part of the channel are throwing of fish on the landing beaches; the insufficient use of ice on both the boats and the landing beaches, and long waiting times of the trucks at the beach competing for fish. This results in early deterioration of the fish.

Continued demand for fishery products in EU, Asia and the Middle-east. The continued demand from EU consumers, and increasingly more from Asia (China, growing middle class consumers), and the Middle East will put more pressure on Kenyan fish processors and subsequently on fishermen.

Domestic Urban Demand for Tilapia: In recent years, the demand for Tilapia in the domestic has been on the increase with Nairobi and Mombasa being the main markets. These markets offer higher prices than the rest of the markets in country. In fact it was observed that it is difficult for consumers around the lake region to access or afford Tilapia from the lake and have to rely on supplies from Lake Turkana. The exact proportion currently consumed by the two leading urban markets is not known, but probably over 50% of total supply.

The focus on only one species, the Nile perch, for export implies a considerable risk. About 50% of all the fish production at Lake Victoria is related to the Nile perch. Therefore, optimizing the level of risk in the chain through product diversification is required. Increased competition from countries such as Vietnam with its massive output of Pangasius catfish, whose white meat is very similar to that of Nile perch, is flooding EU markets.

Poor information flow from and to the actors, and the barriers to these flows: There are almost no incentives for fishermen to change the current status quo. Several market failures can be observed in the fish chain. In the downstream part of the fish channel, from the processing industry to the export markets, information on prices, quality, quantity and standards is quite clear. In the upstream part of the channel, between fishermen and processing industry, the fishermen do not have insight in the price that the processing industry is willing to pay for their fish, and this price can differ among beaches and buying agents. This is the result of an incomplete information flow. The fishermen are dependent on the price that the buying agents are willing to pay. This is also due to interlocked markets, the obligation to sell fish to the buying agent who provides the loan for the boat or the fishing gear. Cooperation among buying agents – agreeing on which price to buy – is common, and leads to a kind of monopolistic buying behavior on the beaches.

High growth potential of the Marine Fisheries: The growth of Kenya's overall fishery development is largely in its marine sector. Kenya should use a two-pronged approach to accelerate gains in the short term, while simultaneously working on improving fishing techniques for the long term.

1. Kenya needs to shift from the current policy of licensing access, currently set at maximum US\$ 20,000 per annum per purse seiner, which is really very small considering the total sale value of catch, to a Fisheries Partnership Agreement. This will not only improve earnings, but will also result in guaranteed payments from the EU as opposed to current direct collection of payments from vessel owners. Given the huge investment and market linkages required to kick-start this sector; signing up for a Fisheries Partnership Agreement with the EU, and eventually with all other DWFN in the country's waters is the only pragmatic approach :
2. Simultaneously, Kenya should develop local capacity to exploit all its marine fishery resources. The country needs to position itself to claim a role as the hub of the tuna in the great yellow fin belt of the South West Indian Ocean extending from Somalia EEZ, through Kenya to the northern parts of the Tanzanian EEZ. Kenya needs to promote joint venture between local DWFN and local private sector investors in the following four areas. Such joint ventures have the advantage of address several constraints facing Kenya including (a) Sustainable market linkages in destination markets; (b) access to overseas credit, which is usually cheaper than from local sources; (c) possibilities for higher value addition levels especially if the overseas partner is vertically integrated at distribution or retail levels; and (d) bringing in the necessary experience in marine industry, especially for tuna.

8. RECOMMENDED UPGRADING STRATEGIES

The overall goal is to assess how to stimulate broad-based economic growth of the fisheries sub-sector in Kenya, whilst taking social and environmental considerations into account. In other words, the objective is to improve the profitability of the various types of micro-enterprises along the value chain (only the IFPs are not micro-enterprises), while simultaneously addressing social constraints and assuring the sustainability of the water resources.

The analysis in the preceding sections demonstrated two key facts. **First**, domestic and export markets are readily available and growing. Kenyan fish products are competitive in export markets and demand exceeds supply in the domestic market for the greater part of the year. Each market is important for its own reasons: the Nile perch (and marine fish) export markets for the foreign currency earnings, the domestic tilapia and food-grade omena markets for food security reasons and the omena feed ingredient market for the growth of the livestock and dairy industries. Second, supply is severely constrained by biological bottlenecks (e.g., maximum sustainable yield for Nile perch), regulatory constraints (e.g., April-July ban on omena fishing) and inefficiencies throughout the value chain. Furthermore, the different value chains overlap or face the same challenges to a large degree which implies that there are synergies to be gained from implementing cross-cutting strategies that affect each of the four main value chains (Nile perch, tilapia, omena, and marine fish species).

Hence the basic strategic recommendation is to: (1) increase the catch of omena, tilapia and marine species, while stabilizing the catch of Nile perch, and (2) reduce the loss (of value) and the operational costs between fisherfolk and consumers for all main fish species (process upgrading). Since fishing, trading, processing and marketing are largely organized by species, the following are the specific recommended strategies by fish species:

Nile Perch (two components): (1) work with the BMUs, IFP agents, IFPs and financial institutes and container manufacturers to reduce the current loss of quality which allows for a shift from selling frozen to higher-value chilled fillets, by improving cold chain (storage & transportation), packaging materials, transportation logistics, and better communication throughout the value chain; and (2) stabilize landed volumes by facilitating/improving access to outboard engines so that more of the fisherfolk can shift to the deeper waters where the average fish size is larger, and by working with the fish processors association to help enforce the fish act (catch size).

Tilapia (three components): (1) work with the BMUs, beach and regional traders, wholesalers, financial institutes, container manufacturers, and ice manufacturers, to reduce the current loss of quality which allows for a greater percentage of the tilapia to be sold fresh instead of processed, or processed instead of as feed ingredient, by improving cold chain (storage & transportation), packaging materials, transportation logistics, and better communication throughout the value chain; (2) work with the DoF and emerging commercial hatcheries to increase the landed volume by restocking the lake with tilapia fry from improved hatcheries; and (3) reduce distribution costs by facilitating collective action amongst traders.

Omena (three components): (1) work with women drying/trading omena on the beach, BMUs, financial institutions and feed manufacturers to reduce the current loss of quality to increase the percentage of omena that can be sold as food grade instead of feed grade by promoting the use of appropriate drying technology (drying racks); (2) increase the landed volume during the legal fishing season (August-March) by facilitating credit (asset financing) for the procurement of fishing gear and boat engines; and (3) reduce distribution costs by facilitating collective action amongst traders.

Marine Fish (four components): (1) work with the BMUs, beach and regional traders, wholesalers, financial institutes, container manufacturers, and ice manufacturers, to reduce the current loss of quality which allows for a greater percentage of the marine fish to be sold fresh instead of processed, or processed instead of as feed ingredient, by improving cold chain (storage & transportation), packaging materials, transportation logistics, and better communication throughout the value chain; (2) increase landed volume by facilitating credit (asset financing) for the procurement of fishing gear and boat engines by traditional fisherfolk, and by changing the policy on fishing rights for deep water vessels; (3) reduce distribution costs by facilitating collective action amongst traders; and (4) align commercial and environmental interests by training fisherfolk to fish in a sustainable way.

Cross-species: working with the BMUs and financial institutions, facilitate access to asset and trade financing along the value chain by (1) developing fish sub-sector specific loans (fisherfolk, artisanal processors, traders) and bringing financial services closer to beach, on the credit supply side; and (2) promoting a savings culture and providing financial literacy and business management training (pricing and costing skills), on the credit demand side.

By way of illustration, one part of the above strategic approach is worked out in some detail in section 10 later in this paper. This illustration will describe the nature and potential impact of a sustainable introduction of insulated containers for the cool storage of fish at the various levels in the fresh fish value chains.

9. FINANCE IN KENYA'S FISH VALUE CHAIN

9.1. GENERAL ASPECTS

The following are the salient general aspects of finance in the fisheries value chain in Kenya. These are not unexpected characteristics, but there are some interesting idiosyncrasies as discussed in the next sections.

- **Enormous cash flows:** The annual landed value (at ex-vessel price¹⁰) is estimated at Ksh8 billion (US\$ 100 million) at least half of which is paid out in cash at the beach by the boat owners or boat renters to the fishing crews (hired labor). IFP agents may carry Ksh1-

Box 1: Value Chain Governance and Artisanal Fish Processing - the Kisian Women's Group

The Kisian Women's Group has 33 active members who engage in the artisanal processing of the Nile perch offal (skins, skeletons) which they buy from the IFPs in Kisumu. They fry the fish skeletons, their core business, and sell them to traders on-site. They process the larger skins into leather using salt treatment and sell it to a local tannery. The smaller skins are cooked and crumbled and sold as food. While the marketing margins on both products are high (50% or more) and easily cover the production costs, profitability is low due to the contractual arrangement with the IFPs. The women have no control over the supply of offal. When a processor tells them that they can come and buy a volume of offal, they have to buy it, even if it is more than they know they can sell in the market. This is for example the case in April –June, when demand is low, as staple crops like maize are harvested then in Kenya, and supplies of offal are high. They have no choice because (1) if they don't buy always, they will not be able to buy at all, and (2) those group members who do the actual buying for the group have significant security deposits with the IFP, an entry requirement, which they would lose if they do not buy "on command". They have no means to store their output and sell when demand picks up again. In those times of oversupply, they bury the surplus raw materials, those that can not be sold as food or feed, in the ground at a total loss. As they lose cash in the peak supply season, they are set up for failure again as they are cash-constrained in buying offal in the low season when demand is higher and profits can be made. All the artisanal fish processors, each of them operating individually, face similar pressures. To begin address this problem, the artisanal processors, or their associations, need to establish an overarching and empowered association that will increase their market power and allow them to negotiate a better deal with the IFPs.

¹⁰ The ex-vessel price is the price received by the fisherfolk for fish landed at the beach.

3 million (US\$15-40,000) in cash around to buy fish on a single trip. This has led to a situation that is both inefficient and insecure.

- **“Unbanked” value chain actors:** Value chain actors, especially upstream in the value chain, are characterized by low financial literacy levels and largely operate outside of the formal finance system. Saving rates are low to absent and transactions are mostly in cash or use trade credit. Value chain actors are highly dependent on informal sources of finance which are unreliable, inadequate and highly expensive.
- **Poor business management skills:** Value chain actors throughout the value chain (with the exception of the IFPs) do not (know how to) use proper costing and pricing methods in their business operation. Proper records are not kept. As a result profitability is low or negative, thus effectively blocking growth of the MSMEs.
- **Weak group organization:** Throughout the value chain, actors behave individualistically. Groups are formed mostly to provide entry points for larger buyers (IFPs) and government and donor programs, with little or no collective action in input procurement or marketing. There are BMUs on all the beaches and many associations and cooperative societies for fisherfolk, fish traders and fishmongers, but these are weak and badly managed. Especially at the level of the fisherfolk, there are few if any economies of scale and market power is low, leaving them at the mercy of the potentially exploitative practices of the fish traders.
- **Vertical power imbalances:** Overall, vertical power imbalances result from the well-capitalized larger traders initiating a wave of supplier credit that ripples through the value chain and creates buyer dependency (viscous cycles of debt). However, vertical power imbalances play out mostly in the Nile perch channel. The dominant players in this value chain are the IFPs who via their buying agents exert market power over the fisherfolk. They also create dependencies by providing equipment on (low-cost) credit to boat owners, which puts the latter in a debt position and locks them in. The greatest dependencies however play out in the artisanal fish processing channel where governance mechanisms keep the small processors of Nile perch offal in a highly dependent position with little or no room for upgrading and growth (box 1).

9.2. NATURE OF THE STAKEHOLDERS INVESTING IN THE UPGRADING OPPORTUNITY

Two characteristics of the stakeholders in the fisheries value chain need to be understood in order for formal finance to become a tool for upgrading and growth: their attitude toward saving and their attitude toward for banks and commercial loans.

Attitude Toward Saving

Stakeholder workshops conducted in 2003 indicated that the lack of a savings culture was by far the most critical constraint to the development of Kenya fisheries value-chain. Historically, there has been little interest in saving by those in the fishing sector for two reasons: (1) there is the perception that there is always fish to catch if they need money (culture element); and (2) options to save through financial organizations are limited (supporting environment element). The former has become less of a factor as fish stocks are depleted and fisherfolk at times come back to the beach empty handed. For the latter, distance is a key factor. For example, it does not make sense for a boat crew member or a woman trading in omena to pay Ksh200 for his transportation by boat from his beach to the nearest bank in order to deposit Ksh1,000 in his account. Even if cost was not a factor, the fisherfolk typically do not have

sufficient time in between the fishing trips to go to the distant banks. There is a need bringing banking services closer to the beaches by using for example ATMs and mobile banking.

Not saving any income is especially common amongst the fishermen (who represent labor, not a business in the value chain). Fishermen come to the area mostly for a limited time period to make some money. They typically get paid in cash on a daily basis by the boat owners or boat renters (as there is no trust between these groups). Having no nearby options available to them to deposit their money (other than putting it under their mattress, or saving it with local shopkeepers which further muddles domestic consumption with productive investment) they mostly spend their earnings the same day on drinks in the bars or on the prostitutes, both of which are readily available on the beaches¹¹. This means their likelihood to upgrade from crew member to boat-owner is severely hampered and they remain stuck as seasonal labor in the industry. For banks, who naturally want to see their customers grow their business, this is an essential problem. Some of the more entrepreneurial fisherfolk do find ways out of the quagmire. For example, they save in “planks”. The traditional fishing boats commonly used in Kenya are procured by taking 14 or 15 planks of a certain type of wood imported from Uganda to a carpenter who builds the boat on order. Some fishermen or women traders thus save some of their income by buying a few planks at Ksh 1,500 each, saving up until they have enough planks for a boat.

Saving and upgrading has been more commonly observed amongst the women fish traders on the beaches. For example, SAGA, one of the more important MFIs in the Lake Victoria area has 50% more women than men as clients. These women are more involved in self-help groups and, as traders, travel more frequently to the towns where banking facilities are available and where they can save their profits. Over time, the more entrepreneurial women invest their profits in buying a boat (or several boats) and the nets and other gear to equip them. Women traders however face other challenges, such as the jaboya system of sex-for-fish. Jaboya in part results from a lack of access to working capital finance, but mostly refers to an extra premium the women traders need to pay “in-kind” on top of cash. The competition for the landed fish makes women give in to the demands from fishermen to ensure a regular supply of fish. Women traders are almost literally “owned” by the fishermen.

Attitude toward Banks and Commercial Loans

The main attitude by actors in the fish value chains toward banks and obtaining commercial loans from banks is that these are cumbersome and high-risk options. They believe that the process to apply for a

Box 2: The Cost of Informal Credit to Fishmongers

The women who sell fried, smoked and sundried fish at Kisumu’s main fish market sell around 20 fish on an average day, but keep a stock of 150 fish on display in order to attract consumers who want to pick and choose the fish they want. This relatively large working capital requirement notwithstanding, the women buy the fish using more expensive credit mechanisms than are available, thus drastically reducing their profitability. Lacking working capital, they buy fish on credit from wholesalers at Ksh60/kg and sell the fish at Ksh65-70/kg. They indicated that the same wholesaler would sell the same fish for cash at Ksh45/kg. Interviews with the wholesalers hint that this difference is probably exaggerated, with the cash price probably being closer to Ksh50-55. Even at that price, the cost of credit is around 10-20% per week (assuming an inventory turnover of one week). At the same time there are several finance institutions that offer market day loans at 1.5% per month. With their retail prices and operational costs unchanged, profits would essentially triple by shifting from wholesaler credit to commercial credit. The fishmongers do not shift because they are unfamiliar with credit from financial institutions, fear they are not eligible or perceive the risks associated with not being able to pay off the loan as too high.

¹¹ There is also a “supply” reason for prostitution on the beaches. Some of the many women who became widows because they lost their husbands due to HIV/AIDS, a rampant disease in the fishing communities around Lake Victoria, engage in prostitution because they see it as their sole way to make ends meet (as documented in the film “Darwin’s Nightmare”).

loan is long, requires a lot of paperwork and in the end there is little chance of actually getting the loan. Furthermore, they feel these loans require them to put their limited possessions, some of which are dear to them or their family, at risk as collateral. This attitude is born out of a lack of knowledge on the current banking service offerings as well as out of previous negative experiences with micro-lending organizations which faced a number of challenges including declining funding levels, unsustainability and the lack of a supervisory and regulatory framework. Stakeholders therefore prefer to stick to traditional credit forms, which are however far more expensive (Box 2). Banks are addressing this through intensive information campaigns and the provision of financial literacy training provided by credit officers who spend most of their time in the field, with some success.

9.3. NATURE OF THE FINANCIAL SERVICES PROVIDERS AND THE PRODUCTS THEY OFFER

Before delving into an overview of finance providers and their products in Kenya's fisheries sub-sector it is important to highlight one important dynamic: the re-emergence of commercial banks in Kenya's rural areas. Rural finance had been tried by commercial banks in the late 1980s and early 1990s in Kenya, but failed. Rural clients were left in the dust rather carelessly by the retracting banks, leaving the rural poor with distrust for formal banking. There are various reasons for this failure, but high cost-to-loan-value ratios, non-customized products and a lack of customer knowledge combined with ineffective screening, in combination with an overall downturn of the industry in the mid-1990s, are some of the core factors. With profits eluding them, banks had withdrawn from rural areas and focused their marketing efforts on urban markets. This started to change in the late 1990s when Equity Bank, Kenya's fastest growing bank, led a shift back to the opportunities offered by rural savers and borrowers. Equity Bank developed a rural banking model that addressed past failures by lowering thresholds and using innovative approaches such as village mobile branch banking (Box 3). After resounding success in the rural areas of Kenya's central highlands, Equity Bank expanded to other rural areas. The latter included the Lake Victoria area where they opened three branches in 2008 and developed loan products specifically targeting the fishing sub-sector, the region's main industry. When Equity Bank showed that rural households represent a highly profitable market opportunity, other commercial banks (e.g., Co-operative Bank, KCB) were quick to follow.

The re-emergence of commercial banks in rural areas has two further implications. **First**, these banks' greater stability, broader range of services and lower costs implied increased competition for the other credit providers, mostly microfinance institutions, which subsequently had to improve their competitiveness (or face losing their market). These MFIs have to some extent also lost the confidence of the rural poor as there have been several cases of the MFI going out of business and taking the poor's savings with them to the grave. **Second**, the banks' larger and more diverse customer base and broader geographical presence gives them the capacity to cover covariant risks (e.g., weather-related risks such as droughts or flooding) through direct insurance services or by pooling emergency funds financed by clients. However, at this point these products are still in the development stage.

A wide variety of credit providers and provision schemes are present in Kenya's capture fisheries sub-sector, offering a wide variety of options to value chain actors. Each has its own competitive advantages and limitations, and most of them operate at all levels of the value chain. Table 5 provides an overview and describes finance supply by type of financial services provider, indicating the point(s) in the value chain where they compete.

Commercial banks have emerged with a competitive offering, as indicated. This category also includes the off-shore and lower cost banking facilities to which the larger and foreign currency earning IFPs have access. There are several **microfinance institutions** in the Lake Victoria area, many of them linked to commercial banks. Key examples here include SAGA, CENT, Osienala and Adok Timo. SAGA is a microfinance institution that works with three commercial banks (K-Rep, Kenya Commercial Bank, Co-operative Bank). It provides the day-to-day management of traditional Savings and Credit Cooperative Societies (SACCOS), each of which has 10 Accumulated Savings and Credit Associations (ASCAs) as its members. In turn, each

ASCA has 7-20 individuals as its members. Banking services (various types of credit and savings) are offered at the group level. SAGA has 20,000 clients and a loan portfolio of Ksh80 million (compare to Equity Bank's 2.5 million clients and Ksh25 billion loan portfolios). CENT SACCO is a credit union with 9,500 shareholder-members and Ksh22 million in outstanding loans. It is faith-based and works through three Front Office Service Activity (FOSAs) and a number of "village banks". It is supported by funding from Oikocredit, a global financier of microcredit. Osienala, an environmental support program focused on Lake Victoria, developed credit facilities on the beaches called "beach barns" in collaboration with Post Bank and K-Rep Bank. Adok Timo is an independent limited company which grew out of a development project and still receives management support

and funding from the Archdiocese of Kisumu. **Direct value chain finance** is the most important form of credit provision in the fisheries value chains. Trader credit, mostly supplier credit, characterizes most transactions. In addition, the IFPs provide most of their buying agents' needs (truck with driver, ice, money to purchase fish) as well as low cost credit for asset financing at the fisherfolk level (outboard engines, netting gear, etc.). Rotating Savings and Credit Associations (ROSCAs) which are called merry-

Box 3: Pushing the Frontiers of Microfinance - The Equity Bank Story

Founded in 1984 as the Equity Building Society (EBS), Equity Bank (EB) transformed itself dramatically from a small, insolvent mortgage lending company into a fast-growing, internationally recognized commercial bank. In 1994, when EBS was found to be technically insolvent by the Central Bank of Kenya, it avoided dissolution by shifting to a bold new strategy and visionary executive management team. Using best practices from MFIs, its vision focused nearly exclusively on Kenya's marginalized urban **and** rural poor, those considered "unbankable" by most commercial banks, and thus a less competitive market. These poor are small scale farmers, micro-businesses and low-end salaried workers, which in the end, make up roughly 80% of Kenya's population. Key characteristics of their business model are: (1) strong executive leadership that keeps the focus on customer needs leading to continuous and individualized product customizations (mostly microloans with an average value of around US\$200) and improved accessibility (number of branches and their location, ATMs with deposit function, mobile branches banking, elimination of maintenance fees and collateral requirements to open accounts); (2) a meritocratic and decentralized staffing system; (3) intense two-way interaction with existing and potential customers (market research, financial literacy training to clients, individualized needs assessment); and (4) a rapid increase in scale backed up by a robust, state-of-the-art IT platform that kept costs per account and per loan low (low margin, high volume model). While EB's cost of maintaining an account is the lowest in the commercial banking industry, its average loan interest rate is the highest because of their singular focus on higher risk micro-credit. Its loan interest rates are however competitive relative to those of MFIs. The bank's strategy hit gold. In June 2008 it had 2.5 million customers (45% of all accounts in the formal banking industry), with currently 3,000 new customers opening an account on every day EB opens its doors. Profits before tax grew on average at 84% per year from Ksh33.6 million in 2000 to Ksh2.4 billion in 2007. Even during the period of post-election violence in early 2008, EB's incredible growth rate is still increasing, with profits in June 2008 199% higher than in June 2007. In 2004 EBS became EB, a commercial bank, and was listed on the Nairobi Stock Exchange in August of 2006, valued at Ksh6.1 billion (US\$). By June 2008, 2 years later, its shareholder value had tripled Ksh18.3 billion. The company's overall value (total assets) of Ksh70 billion makes it the third largest company in Kenya. EB's success led to it being named 3rd best micro-finance institute in the world, and best in Africa in a global study by MicroCapital in 2006. It is also the subject of case-studies at Stanford and Harvard University. Given its fast growth, Equity Bank eyes expansion throughout Africa and as a first step in this direction bought a MFI in Uganda in 2008.

go-rounds in Kenya, Self-Help Groups (SHGs), ASCAs, called table banking in Kenya, local shopkeepers (for savings) and moneylenders are the predominant **informal finance mechanisms**.

In addition to the listed credit providers, there are a number of other players and initiatives, mostly **donor** driven, that influence, or could influence, credit provision in the fisheries sub-sector. FSD (Financial Sector Deepening), the Bill and Melinda Gates Foundation, and USDA are implementing World Association of Credit Unions (WOCCU) programs, combining for 100 million in loans. With 4,000 credit unions, 4 million members, a 20% penetration rate of the economically active population, and US\$2 billion in both savings and loans, Kenya has the largest credit union program in Africa. But their presence is rather limited in the fisheries sector (e.g., CENT). Donor projects also bring in direct funding for upgrading in the fisheries sub-sector. The EU funded a project implemented by the NGO AfricaNow. SIDA, DFID, and GtZ all funded upgrading activities at various points in the fish supply chain. USAID interventions have also played an important role in this context (see section 10 below).

TABLE 5: TYPES OF FINANCE PROVISION IN KENYA'S FISHERIES SUB-SECTOR

Type of Finance Provision	Value Chain Actor(s) Targeted	Product Characteristics	Borrower Requirements (screening)	Competitive Strengths	Competitive Weaknesses
Commercial Banks (K-Rep, Equity Bank, Coop Bank, Post Bank, off shore credit, etc.)	Fishermen, boat owners, traders, coops and associations IFP agents, BMUs, artisanal processors, transporters, IFPs, and ice makers.	Asset financing loans: loan amount determined by cash flow of business and presence of guarantors, not by savings. Can be 100% of the asset value, but standard is 30% equity. Loan size varies from Ksh15,000 to Ksh2 million, payback period of 6-48 months. 1.5-2% per month interest. Principal goes directly to the collaborating asset supplier. Working capital loans in the range of Ksh500 to Ksh500,000 repaid in 6-12 months, at 1.5% per month. Trade loans: payback period increases from 6 to 9 to 12 months as borrower builds creditworthiness history. Fixed loan appraisal fee of Ksh1,500 for asset financing and 2% loan insurance fee. 6% per month penalty in case of late payments.	Have to be a client. 30% equity needed for asset loans. Screening: bank statements reflecting business cash flows, references, visits to the enterprise by loan officers. Default rates are below 5%.	Strong organization (less chance of bankruptcy, corruption, CBK insured deposits). Lower costs. Enough liquidity and services to handle needs of upgrading businesses. Incentives such as 20% of interest paid back to borrower as a bonus if payments were on time. Three day loan approval/rejection process.	Branches too far from beaches. Perceived as too cumbersome.
Microfinance Institutions (SAGA, CENT,	Fishermen, boat owners, traders,	Smaller loans, repayment in less than 1 year (5-14 days for	Have to be a client or in some cases a member	Close ties to the targeted communities,	No source for larger loans at SME level

Type of Finance Provision	Value Chain Actor(s) Targeted	Product Characteristics	Borrower Requirements (screening)	Competitive Strengths	Competitive Weaknesses
Osienala, Adok Timo, etc.)	coops and associations IFP agents, BMUs, artisanal processors, transporters, and ice makers.	market day loans), loan amounts of Ksh1,000 to Ksh500,000. The asset becomes the collateral (micro-lease). Limited by savings amounts (e.g., can only borrow up to 3x savings and max of Ksh50,000 for normal and market day loans, and 5x savings for enterprise loans). 1.5-2% per month interest for asset loans, 2-7% per 7-14 days for market day loans, plus Ksh100 or 1% application fee, and 2% loan insurance.	with shares that act as security. In some case, loans are made to groups only (e.g., for engine purchase).	better knowledge on loan applicants. Services located closer to the beaches. Bad debt is below 5% but increasing due to dire economic situation.	(e.g., purchasing a truck). Often underfunded and donor dependent. Loss of savings in case of bank bankruptcy. Services more limited than commercial banks. Finance products not fully tailored to fishing industry.
Direct Value Chain Credit (supplier or buyer credit, embedded credit)	Boat owners, traders, IFP agents, BMUs, artisanal processors.	Asset financing: Smaller loans, interest rate varies, may be zero, as locking in supplier is key motivation. Trade credit: based on dual pricing system rather than on an interest rate.	Strong relationship between seller and buyer.	Lower screening costs in principle. Motivated lender and borrower in the case of embedded credit.	High amount of bad debt. Transaction dependency for the borrower.
Informal Finance Mechanisms (ROSCAs, ASCAs, money lenders, local shopkeepers)	Fishermen, boat owners, traders, coops and associations IFP agents, BMUs, artisanal processors, transporters, and ice makers.	High interest, short term loans in the case of money lenders. Smaller loans in the case of ASCAs. Low or no cost loan in the case of ROSCAs.	Membership, which acts as a screening tool.	Makes it easy to save. Low risk of default. Facilitates the availability of larger sums (relative to household budget).	Little control over the timing of both saving and extracting money. Risk of mismanagement and theft. High interest rates in the case of money lenders.
Donor Projects	Fishermen, boat owners, traders, coops and associations IFP agents, BMUs, artisanal processors, transporters, and ice makers	Subsidized credit (e.g., interest free loans). Loan guarantees.	Meet the donor's selection criteria.	Low cost, low risk credit. Credit often accompanied by additional support activities.	Risk of below market price sales which distort the market.

9.4. UPGRADING & FINANCE ILLUSTRATION – INTRODUCTION OF COOLERS IN THE IPF CHANNEL

The main (process) upgrading opportunity discussed in report after report and throughout the key informant interviews conducted for this study, relates to the dire need for cold storage capacity at each level of the value chain. The combination of a highly perishable product and a nearly completely absent cold chain (ice, insulated storage containers) makes spoilage one of the main inefficiencies in Kenya's lake and marine capture fisheries value chains. Less than 10% of the fisherfolk and less than 10% of the landing sites use insulated containers. In terms of ice, even with a clear demand for it and a decent production capacity, supply is not forthcoming for various incentive and capacity related reasons (Box 4).

Lack of cold chain infrastructure forces fisherfolk to return earlier to the beach, especially as most boats do not have engines. At the beaches, storage capacity is mostly needed during the long rainy season (March-May) when supplies are abundant and a single boat can bring in up to 400kg in a single day but roads are at times impassable, making the time between landing on the beach and purchase by a trader much longer. When supplies are low however, storage is also important as it allows the fisherfolk to bulk supplies over several days, thus having volumes for sale that are sufficiently large to hire trucks or attract traders with trucks that allow for bulk transportation to the more lucrative fish markets in the main urban areas such as Nairobi and Mombasa. At any rate, it would give the fisherfolk time to call around and identify buyers in an expanded market. Lack of storage thus puts them in a weak bargaining position relative to the traders on the beach. When there is an abundant supply, traders literally wait at the beaches while the fish loose there freshness and fisherfolk have to give in and sell at the low prices dictated by the trader at the end of the day. Further down the value chain, lack of cold storage leads higher rejection levels by processors and wholesalers, with most of the rejected fish being sold as lower value products: fresh fish for less discerning local markets (as opposed to for example hotels in Nairobi), artisanally processed fish (fried), or ingredients to the fishmeal industry. The loss in value can be 80% or more of the prevailing market rates. Some of the fish cannot be sold in any form or fashion and has to be thrown away at a total loss. Overall, over the course of a year, loss in value at the beach sites varies from 7% to 25%.

Box 4: Why Ice Producers Do Not Meet Demand

There are various producers of ice in the Lake Victoria area: IFP plants, the ice plants in Mbita Point (see section 10), Marenga beach, and Port Victoria, smaller ice producers and the Coca-Cola plant in Kisumu. Potentially, this production capacity, estimated at 700MT per day, would go a long way toward meeting the real and sizeable demand for ice in the fisheries value chains. So why do they not supply this ice? The reasons are varied. The IFPs do not want to sell their ice, even as they produce more than they need, because they want to link ice to their own buying agents and lock in supplies. Agents still do some side-selling of the ice they get from the IFPs, but volumes sold are small. The Mbita Ice plant operates at less than 15% of capacity, mainly because of its weak managerial structure. Similarly, the 30 MT cold storage facility of the Port Victoria ice plant cannot be used because of an unreliable electricity supply. The smaller ice producers lack appropriate equipment and are perceived as risky in terms of the quality of the water used to make the ice (if the water is not clean it will offset the preservative effect of the ice and the fish will spoil). The soft drink manufacturer only wants to sell its ice exclusively to its distributors.

Fish quality improvement implies upgrading throughout the supply chain. Quality starts with the fisherfolk and has to be maintained all the way to the final consumer. This implies investment in upgrading all along the supply chains as well as by service providers. For example cold storage capacity has to be present on the boats, at the landing beaches, during transportation to markets and in the wholesale and retail markets. This upgrading implies that suppliers of coolers, of ice to fill the coolers and

of credit to buy the coolers and the ice have to be present and face a profitable market from their perspective.

Given this situation, one proposed upgrading strategy to deal with this challenge in a sustainable way is the following: (1) work with container manufacturer Kentainers to design new types of plastic insulated containers (coolers); (2) introduce small coolers to the boat owners and large coolers to the beaches via the IFP agents and accompany this with training on fish quality preservation; (3) bring in a commercial bank as the financial partner to provide asset and working capital financing, as well as financial literacy and business management skills training as an embedded service to the new borrowing customers (boat owners, BMUs) and related stakeholders (fishing crews, women traders); (4) work with the Mbita Point ice plant and the IFPs to establish a cost-effective and reliable distribution system for ice.

The approach is characterized by sustainability and innovation. Sustainability, in the sense of how will goods and services be paid for commercially without any donor funding, comes in three forms: embedded services (e.g., between bank and borrower, between IFP and fisherfolk), for-fee services (such as ice supply and post-catch fish handling) paid for from increased fish sales, and from the presence of profitable and sizeable markets for the commercial bank, the container manufacturer and the BDS provider (more than 15,000 boat owners, more than 300 beaches). Innovation comes into play in terms of technology, finance, the role of IFP agents and governance/partnerships.

New (appropriate) technology: Currently the fisherfolk and traders use, if anything, self-made wicker basket with a liner in which ice only lasts for about 6 hours and which can be used only once or twice¹². Insulated plastic containers (small ones that fit in the fishing boats, medium-sized ones for traders that transport with public buses, large ones that for the beaches that can hold several days of fish catch) would allow the ice to be preserved for at least 24 hours and can be used for 10 years or longer. They would pose challenges of their own though, such as the need to clean the re-useable containers to meet food safety standards (improved fish handling procedures) and the need to keep their weight manageable (in boats and in road transportation). But these challenges can be addressed. In addition, the little ice that is being used by the fisherfolk is mostly block ice, whereas flaked ice is needed to cool the fish properly with alternating layers of ice and fish. This means that ice production technology has to change as well for some ice producers.

New finance elements: Instead of embedded credit for the procurement of equipment (from IFP to fisherfolk) which creates dependencies and is limited in its potential impact, formal credit products would be introduced to finance the procurement of the containers. Given they ultimately stand to benefit from the investment through larger supplies and higher quality, IFPs could still subsidize part of this investment cost. This would also help ensure the buy-in of these channel captains. Instead of cash transactions, the model calls for the combined introduction of new savings options (ATMs on the beaches, boat-based mobile banking) and financial literacy training, mostly to deal with the increased working capital requirement (ice procurement) and cash flows (manage for profitability). Working capital needs are also related to the increased role of agents, who take on multiple roles. This could be in the form of bank overdraft facilities or invoice discounting (factoring).

¹² If the wicker baskets are being replaced by re-usable insulated plastic containers, this would represent a loss of local income for those in the local community who make the wicker baskets. However, fishing efficiency would improve and it is assumed that these gains outweigh the loss of income from making the baskets. A more detailed economic feasibility study is needed to verify this assumption.

New role for IFP buying agents: The IFP agent plays a critical and more enhanced role. In addition to continuing their role in fish trading, they provide three additional services, each of which provides them an additional income stream: the sale of containers (at commission), the sale of ice (at commission), and the provision of training on fish handling (after they themselves have received training in collaboration with for example KMFRI). This will require capacity building to develop the broader skill set (sales & marketing, stock control, procurement, human resources management, and so on) and facilitated access to investment and working capital credit. To further strengthen the model, container manufacturers, ice plants and existing or new commercial business services providers need to be integrated to provide an additional pathway to bring these three critical support functions right to the beaches.

New governance/partnership: Given the critical role of the IFP agent (pivotal position) and the IFP itself (dominant player in the directed value chain), it is absolutely critical to bring them on board with the new model. This would mean that IFPs relinquish their strategic use of their ice plants in exchange for a new partnership model with tighter vertical coordination (fisherfolk, agent, IFP) that would ensure of larger and higher quality supplies. This may take on the form of more contractual arrangements, for example fisherfolk get a certain amount of “ice credit” on top of each kg of fish sold to the processor, which they can then use for the next catch. Or the fisherfolk and agents take on an ownership in the IFPs ice plants which they would spin off from the processing plant as a separate limited company. The new company would remain under the management of the IFP, or under independent, professional management, to ensure efficiency and growth, but the co-shareholding would align the interests of the various value chain actors (see section 10 for the case of the Mbita Point ice plant, an example of a weak management structure leading to inefficiency and ineffectiveness). BMUs can take on a direct role in the supply chain and reduce transaction costs and achieve some economies of scale, but their management capacity would need to be improved first.

To further illustrate this upgrading opportunity, Table 5 provides an indication of the potential profit impact of using coolers. This calculation is strongly affected by many price and quantity factors, with the assumed values for each factor indicated in the table. Under the assumptions of a 10% increase in the volume of the fish sold (in a context of a current rejection level of on average 14%) and a 10% increase in the average price of the fish sold (in a context of a C-grade quality price which is six times the C-grade quality price), profitability increases with 23%. Given our assumption that the investment cost of coolers is paid off in year 1, and that these coolers last at least 10 years, profitability will increase with 33% in the next years relative to the before-cooler-introduction benchmark.

TABLE 6: POTENTIAL PROFIT IMPACT OF USING COOLERS AT THE FISHERFOLK LEVEL

Item	Unit	Before Cooler Introduction			After Cooler Introduction		
		# of Units	Unit Price	Value	# of Units	Unit Price	Value
Labor	Kg	1,500	36	54,000	1,650	39.6	65,340
Depreciation & Repair Boat & Gear	Lump sum	1	60,000	60,000	1	60,000	60,000
Ice	Kg	0	5	0	1,650	5	8,250
Loan Repayment Cooler	Lump sum	0	2,180	0	1	2,180	2,180
Storage Cost Beach	Kg, day	0	1	0	1,650	1	1,650
Total Cost				114,000			137,420
Total Revenue	Kg	1,500	90	135,000	1,650	99	163,350
Profit				21,000			25,930

	Before Cooler Introduction			After Cooler Introduction		
Profitability Impact: 23%						

Note - The above calculation is based on the following assumptions: average quantity sold before coolers=10kg/trip; 150 trips per year; annual depreciation & repair cost of Ksh60,000/year consisting a Ksh50,000 wind/paddle driven boat lasting 5 years and Ksh100,000 worth of net gear lasting 2 years; the cost of the cooler in the boats of Ksh2,000 is written off in 6 months in year 1 at 1.5%/month; the larger cooler on the beach of Ksh50,000 is written off in 6 months in year 1 at 1.5%/month, and will charge Ksh1 per kg, per day; fish is stored at the beach for on average 1 day and the beach handles 500kg/day; 1kg of ice is used per kg of landed fish (in the boats and on the beach combined); ice is sold at a subsidized price of Ksh5/kg; both the units of fish sold and the average sales price per unit increase 10% due to the coolers.

10. EVALUATION OF AMAP FSKG VCF GUIDELINES

The following four observations can be made regarding the insights gained from this case-study for the development of value chain finance guidelines under the AMAP FSKG project.

(1) On the Value of Adding Finance/Governance to the Analysis

Adding a more in-depth analysis of the closely related finance and governance aspects of the value chain provides true insights into: (1) the essence of the problems standing in the way of growth at the business and value chain levels; and (2) the behavior of stakeholders (their capacities and incentives). These insights will greatly facilitate the identification of the most effective development support programs. This case study for example highlights how trade dependency is an important disadvantage of direct finance, and how the nature of the economic activity shapes culture and how culture creates certain attitudes related to finance that impede growth.

(2) On Asset Financing vs. Working Capital Financing

Asset financing typically gets more attention when assessing finance issues in the value chain, but working capital financing is as critical. Asset financing is easier to obtain for collateral-strapped value chain actors because the asset bought becomes the collateral. For working capital credit this is not an option and borrowers therefore resort to costly informal credit alternatives. Asset and working capital financing are interlinked as working capital considerations come in to play when operationalizing new asset investments. For example, introducing coolers requires assuring there is working capital to buy ice, or introducing engines or trucks requires working capital for gas and maintenance. Working capital in the form of trade credit is especially important in supply chains with many intermediaries (such as fish supply chains in Kenya). Each of these intermediaries will need to increase their working capital if increased volumes are to move through the supply chain.

(3) On Financial Literacy/Business Skills

This relates to critical importance of the borrowers' 'acumen', their know-how with respect to making wise business decision and to obtaining the best finance product and using it in a way that maximizes profit. Many stakeholders in the fisheries value chains in Kenya completely lack these skills, the presence of which is a sine qua non for the successful upgrading of firms and the growth of sub-sectors. They engage in business activities for which profitability is not only unknown, they even lack the notion that they should abandon loss-making business models. A sustainable approach to building the business skills of value chain actors should be part of any upgrading strategy.

(4) On Firm Level Profit vs. Product Profit Margins

The analysis of profit margins has to be done carefully, observing a business' operations and cash flows in their entirety and over at least a one year period. It may seem that producing, processing or distributing a certain product is profitable, but maybe only during a certain period in the year (due to varying volumes and prices) or only in the absence of linkages that affect overall firm profitability (as illustrated in the case of artisanal fish processors in Kenya, box 1). Conversely, one profitable activity may need to be complemented by another profitable activity to assure firm growth. For example, fisherfolk can combine fishing with vegetable production or aquaculture to reduce overall risk and thus improve credit worthiness. Aquaculture is an interesting complementary activity because it would allow for a stabilization of fish supplies throughout the year and benefit women, playing into their more home- and beach-bound situation and reducing their vulnerability to the prevailing sex-for-fish practices. This business diversification is an especially attractive option for fisherfolk in the Nyanza and Western Provinces near Lake Victoria as these provinces have some of the largest areas of high-potential agricultural land available in Kenya as well as an abundance of water for irrigation. Some fishermen on the islands in Lake Victoria have already started the cultivation of vegetables under irrigation.

11. EVALUATION OF USAID PROGRAMS RELATED TO FISHERIES IN KENYA

Three overall comments can be made regarding USAID's fisheries sub-sector support activities. First, these activities are fairly limited, with only one public-private partnership and two projects which given their cross-sectional nature (BDS, finance), are only partially or marginally involved in the sub-sector. These three support initiatives and their impact are briefly discussed below. Second, while the activities are well-targeted, i.e., they focus on critical constraints in the sub-sector; they are not always effectively or efficiently structured leading to a lack of sustainability or market distortions. Third, while there is good coordination between the different relevant USAID projects as well as with other stakeholders (NGOs, agribusinesses), the activities are not fully part of an overall fisheries sub-sector value chain development plan with a clear vision and strategy. Our study did not encounter the existence of any such plan in Kenya. A well-designed, dedicated fisheries value-chain project would address these issues simultaneously while leveraging the strengths of the cross-sectional programs, and could have a strong impact on this high-potential sub-sector.

The Kenya Business Development Services (KBDS) project aims to "increase micro-enterprise growth through improved business services delivery" and has implemented several activities in the fisheries sub-sector. They commissioned a capture fisheries value chain analysis for the Lake Victoria area which a key reference document for this study (USAID 2003). The project then engaged in several support activities in the fisheries sector. They assisted the Kisian Women's Group near Kisumu with an inter-chain upgrading process, helping them to process fish skins into leather for a locally tannery (see also Box 1). KBDS assisted another women's group with improved drying techniques and marketing strategies in the omena trade. These activities were promising, but limited in scale and duration, and they overlooked the importance of credit. In early 2008, these initiatives were largely annihilated due to the post-election violence. The project also co-funded a 12 month program implemented by the NGO AfricaNow, in which the commercial bank K-Rep was also a partner providing mobile banking services (K-Rep was later replaced by Adok Timo and Co-op Bank). This program aimed to provide better access to fishing gear (nets, floats, twins, engines) through microleasing. The program also included providing 'booster capital' for beach-based fishing gear retailers which AfricaNow dispensed using below-market interest rates.

While these soft loans were intended to make the retailers market new and improved gear, the retailers just bought standard gear and used the subsidized credit to sell nets below market rates, thus distorting the market and undermining rather than promoting growth through upgrading. The mobile banks that were set up on the beaches attracted some initial customers (fisherfolk were saving), but they eventually collapsed due to mismanagement and they are no longer there.

Through a **public-private partnership**, USAID and IFP W.E.Tilley (WET) combined resources **to upgrade the ice plant** in Mbita Point, increasing its capacity from 1MT to 55MT per day. For WET, the only IFP based in Nairobi and thus far from Lake Victoria, the ice plant has strategic importance. It secures them of a local supply of ice to fill their trucks as they operate for several days along the lake to take in sufficient quantities of fish from various beaches before the trip back to the processing plant. Fisherfolk have shares in the plant which is managed by the local community. The plant's ice supply is far below potential, producing 400kg/day in small volumes for local traders and 4 to 7 MT for filling insulated trucks (i.e., the plant operates at less than 15% of capacity). Trucks often have to wait for several days to fill up with ice. In part this is due to an unreliable electricity and water supply, but also because of a weak management structure that demonstrates little entrepreneurial drive or managerial efficiency in producing and supplying ice¹³. The plant, which is located right on the lake, has not developed its own water supply system nor has it installed generators or solar panels to resolve the power supply problem. Two of the four ice making machines have broken down and there appears little effort to repair them. In addition there is no ice distribution network being developed in a model such as for example described in section 8.4 above. No ice is sold directly to the fisherfolk or the beaches.

USAID's Kenya Access to Rural Finance (KARF) project aims to increase and facilitate financial solutions to rural producers. The project has not yet worked directly in the fisheries sub-sector, with co-funding this study representing its first foray into it. However, given the critical role of finance in the development of the fisheries value chain, and increasing role played by commercial banks in this high potential sub-sector, KARF could play an instrumental role in developing sustainable finance models.

USAID's Kenya Coastal Management Program (KCMP), a biodiversity conservation program, did not fully take socio-economic considerations into account and was not focused in any way on economic growth. Its impact in this sense has been limited. Programs such as this one should however play a critical role in more holistic sub-sector development plans that take the triple bottom line into account.

¹³ Although the plant has expanded in a second product line, bottled drinking water.

ANNEX 1: LIST OF INTERVIEWEES

Ms. Esther Muiruri	General Manager	Equity Bank Ltd, Head Office
Mr. Silas Alubmi	Credit Manager	Equity Bank Ltd, Mbita Branch
Ms. Ruth Titus	Business Dev. Officer	Micro Credit, Co-operative Bank
Co-operative Society	Chairman, Members	Luanda Kotieno Beach, Bondo
BMU committee	Chairman, Members	Luanda Kotieno Beach, Bondo
BMU committee	Members	Kiumba Beach, Rusinga Island
Mr. Michael Otieno	Vice-Chairman	Yokia BMU, Mfangano Island
Mr. Sofi Omoro	Officer	Fisheries Department, Kisumu
Mr. Anthony Sifuna	Officer	Fisheries Department, Kisumu
Mr. Prakas	Quality Assurance Manager	East African Sea Food (IFP)
Ms. Clarice Aduma	Credit Manager	Equity Bank Ltd, Kisumu Branch
Mr. Omondi	Head of Fisheries	Fisheries Department, Suba District
Ms. Lucy Okal	Quality Control	Fisheries Department
Mr. Steve Obonyo	Accounts Clerk	Mbita Point
Mr. Okeyo	Chairman	Luanda Kotieno Beach Co-op Soc.
Ms. Beth Oginde	Secretary	AFIPEK, Nairobi
Ms. Elizabeth Odinga	Chairperson	Kisian Nyariam Women Group
Mr. Dominic Odinga	Omena Trader	Fresh fish market Kisumu
Mr. David	Nile Perch Trader	Fresh fish market Kisumu
Mr. Victor Otieno	Nile Perch/tilapia Trader	Fresh fish market Kisumu
Ms. Mary Aketch	Fish Trader	Fresh fish market Kisumu
Mr. Isaac Odhiambo	Nile Perch/Tilapia Trader	Fresh fish market Kisumu
Mr. David	Nile Perch/Tilapia Trader	Fresh fish market Kisumu
Mr Vincent Ogutu	Tilapia/Nile Perch Trader	Fresh fish market Kisumu
Ms. Elizabeth Akoth	Nile Perch Fillets Trader	Fresh fish market Kisumu

Mr. Bernard Omondi	Fishmonger	Fresh fish market Kisumu
Ms. Mary Awino	Nile Perch/ Tilapia Trader	Fresh fish market Kisumu
Ms Benta Atieno	Fishmonger	Gikomba Market, Nairobi
Ms. Wanja	Fishmonger	Gikomba Market, Nairobi
Ms. Angela Akoth	Ag. General Manager	SAGA Thrift and Promotion
Mr. Douglas	Branch Manager	CENT SACCO Kisumu
Ms. Josephine	Loans Officer	CENT SACCO Kisumu
Mr. Esborn	Chairman	Umoja Fishmongers, Kisumu
Mr. Eric Omollo	Secretary	Umoja Fishmongers, Kisumu
Mr. Dominic Odinga	Organizing Secretary	Umoja Fishmongers, Kisumu
Mr David Otieno	Country Director	Africa Now, Kisumu (NGO)
Mr. Bhavesh Mandalia	Shopkeeper	Webuye Wholesalers (fishing gear)
Mr. Juma Denis	Sales Manager	Car & General (boat engines)
Mr. Raphael Mwatha	Officer	Fisheries Department, Nairobi
Ms. Lucy Obungu	Chief Fisheries Officer	Fisheries Department, Nairobi
Mr. Titus Odhiambo	Chairman	Fish Traders Assoc., City Market
Ms. Elizabeth Mutua	Sales & marketing manager	entainers, Nairobi
Ms. Evelyn Noah	Promition Executive	Export Processing Zones Authority
Mr. Marjan Khamis	Production Manager Feeds	Pembe Flour Mills, Nairobi
Mr. Firoz Jessa	Chairman	WE Tilley (IFP)
Mr. Zul Jessa	Managing Director	WE Tilley (IFP)
Mr. Daniel Mungai	Officer	Fisheries department Headquarters
Mr. Dedan Mungai	Officer	Fisheries Department Headquarter
Mr. Peter Nzungi	Officer	Fisheries Department Head quarters
Mr. John Karungo	Officer	Fisheries Department, Mombasa
Mrs. Martha Mukira	Officer	Fisheries Department, Mombasa
Mr. Ephraim Wairangu	Officer	Fisheries Department, Mombasa
Mr. Geoffrey Kamakya	Officer	Fisheries Department, Mombasa
Mr. Charles Gatune	Officer	Fisheries Department, Mombasa

Mr. Kennedy Shikami	Officer	Fisheries Department, Mombasa
Mrs. Maxine Mutisya	Officer	Fisheries Department, Mombasa
Mr. John Muturi	Officer	Fisheries Department, Mombasa
Mr. Viulance Mwabili	Officer	Fisheries Department, Mombasa
Mr. Benrick Ogutu	Officer General Manager General Manager	Fisheries Department, Mombasa Transafrica Fisheries Ltd. Mombasa Old Town Fish Shop
BMU	Chairman Fish Trader	Old Mombasa Port Fish Market Kongowea Market Dry Fish
Mr. Mohamed Khizer Ayub		Kenya Dry Fish Market, Mombasa
Mr. Joshua Kazungu	Manager	Equity Bank, Malindi
Mr. Isaac Wafula	Officer	Fisheries Department, Malindi
Mr. James Kilonzo	Officer	Fisheries Department, Malindi
BMU	Chairman, Members	Mayungu Beach
Mr. Simon Komu	Officer	Fisheries Department, Lamu
BMU	Chairman, Members	Lamu Beach Lamu district
BMU	Chairman, Members	Kizingitini Beach Lamu District
Mrs. Christine Ndung'u		East Africa Sea food Ltd., Mombasa

REFERENCES

- Abila. R. O. (2003) *Food Safety in Food Security and Food Trade: Case Study: Kenyan Fish Exports*. Focus 10, Brief 8 of 17. IFPRI. September 2003
- Abila, R..O. and K. Werima. (2006) *Strategy for Assessing Impacts of Ice on Fish Landing Beaches of Suba District*. Consultancy Report for AfricaNow.
- Coates, B. (2007) *Equity Bank Case Study*. Stanford, Graduate School of Business.
- Delgado C.L, Wada N, Rosegrant M. W., Meijer S, and Mahfuzuddin Ahmed (2003). *The Future of Fish, Issues and Trends to 2020*. International Food Policy Research Institute and WorldFish Center.
- FAO (2006) *FISH INFO Market study*.
- FAO (2007) *Kenya Fishery Country Profile*.
- Frohberg K, Grote U and Etti Winter. 2006. *EU Food Safety Standards, Traceability and Other Regulations: A Growing Trade Barrier to Developing Countries' Exports?* International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12-18, 2006
- Henson S. and Winnie Mitullah 2004. *Kenyan Exports of Nile Perch: The Impact of Food Safety Standards on an Export-Oriented Supply Chain* World Bank Policy Research Working Paper 3349, June
- Jansen, A. (2007). *Value Chain Finance: Understanding & Increasing Access – A Concept Paper*. USAID.
- Kenya National Bureau of Statistics (2007) *Statistical Abstract 2007*. Government of Kenya.
- KMFRI (2003) *The Impact of the Slot Size Measure on Lake Victoria Fisheries (Kenya Component)*. Kenya Marine and Fisheries Research Institute.
- Laws of Kenya. (1991) *The Fisheries Act Chapter 378 Revised Edition 1991*.
- Market Economies Development (2007) *Systematization and Analysis of Bottlenecks Affecting Marketing and Value Addition for Selected Agricultural Commodities in Kenya and Recommended Actions*.
- Mwikya S. (2007) *Globalised out? A case for Fish Trade in Developing Countries*. Organisation for Economic Co-operation and Development TAD/FI/GLOB(2007)5
- Muthiga N., Maina J. and im McClanahan. (2003) *The Effectiveness of Management of Marine Protected Areas in Kenya*. A report prepared for the international tropical marine environment management symposium, Manila, Philippines, March.
- Ondari, J. (2008) *Equity Bank Half-Year Profit Doubles*. Daily Nation, July 26, p. 22.
- Petersen, M.B. (2006) *Market Heats When Fish Cool Down*. MS Danish Association for International Cooperation, <http://www.ms.dk/sw1574.asp>.

Ponte S. (2008). *Developing a 'vertical' dimension to chronic poverty research: Some lessons from global value chain analysis*. Working Paper June 2008 No. 111 Chronic Poverty Research Centre.
www.chronicpoverty.org

Republic of Kenya (2005) Annual Report 2005, Ministry of Livestock and Fisheries Development, Fisheries Department.

Roheim C.(2004). *Trade Liberalization in Fish Products: Impacts on Sustainability of International Markets and Fish Resources*, Global Agricultural Trade and Developing Countries Aksoy, A. and J. Beghin (eds.). 2004., The World Bank, Washington, DC,

Schuurhuizen, Van Tilburg A. and Kambewa E.(2006) *Fish in Kenya: The Nile-perch chain from Agro-food chains and networks for development*, 155-164. R. Ruben, M. Slingerland and H. Nijhoff (eds.), 2006 Springer.

Thorpe A. and Elizabeth Bennett. (2004). *Market-Driven International Fish Supply Chains: The Case of Nile Perch from Africa's Lake Victoria*. International Food and Agribusiness Management Review Volume 7, Issue 4.

USAID (2003) *Lake Victoria Fish Sub-Sector Analysis Report*. Kenya Business Development Services Program

WOCCU (2007) *2007 Statistical report*. World Council of Credit Unions

Wright, G.A.N. and D. Cracknell. (2007) *Equity Bank's Market-Led Revolution*. MicroSave.