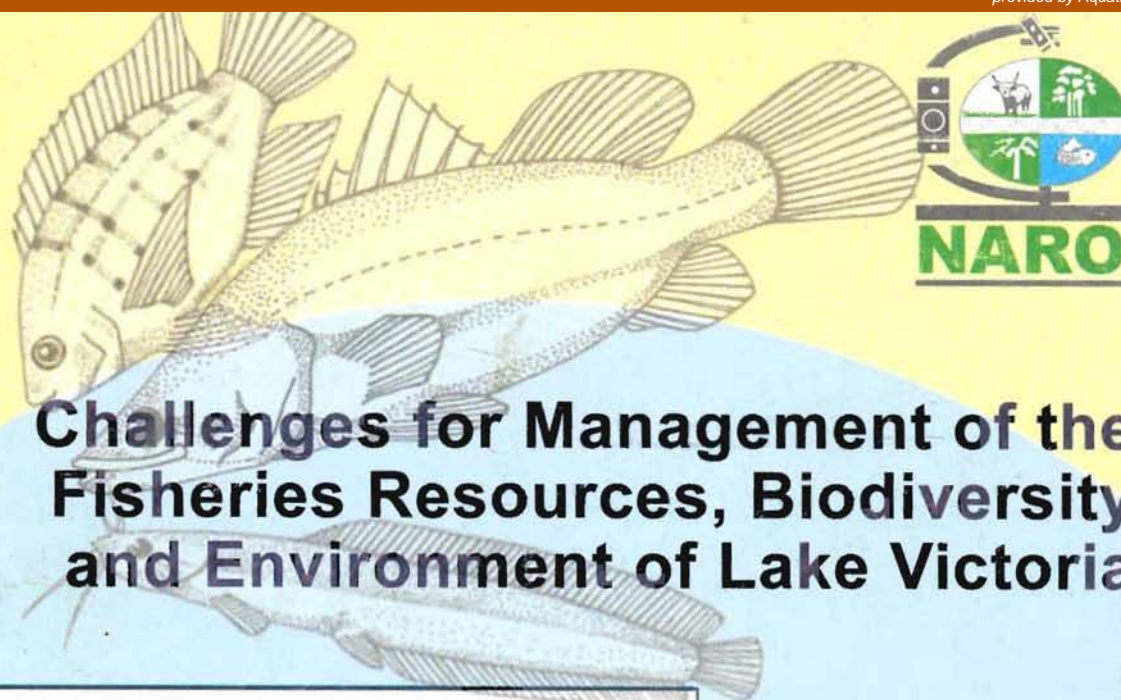


FIRRI



Challenges for Management of the Fisheries Resources, Biodiversity and Environment of Lake Victoria



Editors:
J. S. Balirwa,
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Fisheries Resources Research Institute

Technical Document No. 2 First Edition - 2004



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9.4. Implications of the industrial fish processing growth for the commercial fishery and fishers in Uganda

P.W. Namisi

Introduction

Lake Victoria is the most important fishery for all the three riparian countries (Kenya, Uganda and Tanzania). Total fish production from the Ugandan part in 1997 was 106,800 tonnes (MFPED1 1998, 1999) accounting for ca. 50% of all fish production in Uganda of which 60% was *Lates niloticus* (Nile perch, Mputa) (UFD 1998). The boom in the Nile perch fishery has sparked off large-scale investments in industrial fish processing for exports since early 1990s. The global trade driven by market forces is intensifying and shifting to small-scale fisheries (Ngege and mukene) that are a major source of animal protein for the majority of the poor in Uganda.

Productive and easily accessible fishing grounds located near major population centres already are at or near maximum levels of exploitation due to strong demand. This problem is particularly acute in the central region, which supports Uganda's largest population and demand for fish because of bigger urban settlement and location of fish export processing factories. The high demand for fish almost exceeds locally available supply from Lake Victoria.

The study was undertaken to generate socio-economic information on fish market systems and performance of the industrial processing industry, which will guide the processes leading to modernization of the fisheries sector and, sustainability of Lake Victoria fisheries.

The main objective of this study was to evaluate the socio-economic implications of the fish marketing systems with particular emphasis on fish export market in Uganda. The study thus, analysed the socio-economic characteristics of fishers and examined fish marketing systems and the impacts on the fishing activities, food security, employment opportunities and incomes of fisher-folk communities.

The survey, of 90 fishers (boat owners) and 8 fish factories was conducted from September to November 1999 on Lake Victoria, Uganda. Sampling units were the landing sites and the fish factories, with a fisher and factory manager as main respondent respectively.

Purposive sampling was used to select 8 out of 11 fish factories: Masese, Gomba, Fish and Agro Products, Hwan Sung, Uganda Fish Packers, Ngege, Greenfields and Marine Fish foods, representing all fish factories in Uganda. Some factories were un-operational and had closed down totally due to EU-fish ban in 1997 and 1999, while others were closed for renovation.

Selection of landing-sites was based on a stratified approach that ensured full geographical representation of the Lakeshore and Islands. Two regions (Entebbe and Jinja) out of five fisheries regions of Lake Victoria (Entebbe, Jinja, Tororo, Masaka and Kalangala) were selected as a representative sample because most fisheries activity and industrial processing are constituted here. In Entebbe region, 6 landing sites (Kigungu, Kasenyi, Katosi, Ggaba, Kiyindi and Nsazi) and in Jinja region, 4 landing sites (Masese port, Lwanika, Lolwe and Jagusi) were randomly selected. The market flow information involving fishers, middlemen, whole-sellers and traders was collected and; each market was described and a flowchart for these commercial species was prepared.

Socio-Economic Importance of the Fisheries Industry

Fishing, fish processing and fish trading have provided the basis for food security, employment income and cultural traditions in coastal and inland communities for centuries (FAO 1995a).

Fresh fish is marketed only near production centres although traders will distribute fresh fish to most urban centres accessible by road. The most important traditional fish preservation technique in Africa is smoke drying. Depending on the market, the fish is dried to different moisture levels. A hard-dried product takes up to three days of hot smoking but may keep for several months, allowing for long distance trading. There is active intra-regional trade in traditional smoked/dried fish.

In Uganda, fish is the preferred source of animal protein with 70% of the production consumed domestically. Fish represents about 60% of the animal protein intake. The per capita consumption of fish on average is 12.5 kg per year, although an average figure of 38 kg is characteristic of fisher-folk communities within the radius of 35 km from the lake (SEDAWOG 1999). This is relatively higher than the current per capita consumption for sub-Saharan Region of 6.8 kg/person/year, and almost

equal to the world's figure of 13.6 kg (FAO 1996).

Fish is Uganda's most important non-traditional export with annual volume of about 55,000 tonnes and estimated earnings of US \$ 60-80 million. More than 700,000 people depend directly or indirectly on the fish industry in Uganda. These include: fishermen, fishmongers, fish processors, fish exporters, wholesalers and retailers, and the local administration in the districts, which collects taxes on landing sites and markets. These constitute a marketing system, i.e. the chain of links between producers/suppliers and consumers/users. The potential economic benefits of well functioning marketing systems are immense. However, the extent to which effective market signals about consumers and consumers' needs actually reach the producers and suppliers and their responsiveness to supply these needs depend to a large degree upon the efficiency and design of the marketing system.

Fish processing for exports has increased in importance, being attracted by the growing international market of Europe, the Middle East, the Far East, USA and other developed economies. Their activities include buying fish and fish production either directly or through sub-contracting with fishing enterprises. In the world where both consumers and traders are looking for products that are fresh, natural, transparent, healthy and safe, the fisheries industry in Uganda will continue to face an enormous fish marketing challenge.

Finally, it is a policy of the Government of Uganda to modernize agriculture, raise the quality and consequently increase the quantity of agricultural produce. Research on production and distribution from various sectors is part of the strategy to reduce poverty among the population and; the country has potential to do this from the fisheries sector. Access to precise, current and relevant information is fundamental when making decisions in the business world. Information on prices, species, landings and production, quotas, local and international trade, distribution, consumer needs, health and regulatory regulations and property rights is necessary in the fishery industry.

The Main Commercial Fishery in Uganda

Nile perch is the dominant fish targeted for commercial purposes, while other important species are Tilapia and mukene. Nile perch is mainly targeted for the fish processing factories for export, but the local market also consumes a large volume of it. The drive for profit means that more and more Nile perch has to be fished and this puts stress on the fishery. In the local market, the fish species preferred for consumption by most people is Tilapia (70 % for the whole lake region) against Nile perch (SEDAWOG 1999). Mukene fishery has also become one of the important commercial species for local traders due to its affordability by the poor and the growing local fishmeal industry.

Market Systems and Fish Distribution

There is a well-developed network for fresh fish, with fish being traded in large quantities to most urban markets in Uganda. On Lake Victoria, Uganda, some of the most prominent land beach markets for fish include Katosi, Kiyindi, Gabba, Kasenyi, Dimo; Bugoto, Wakawaka and some other prominent Island beaches. Fishers sell their fish to middlemen, local market traders, traditional fish processors, consumers and sometimes directly to fish processing factories.

Three main commercial fisheries have emerged with characteristic distribution channels (Fig. 9.4.2 a, b and c). The main outlets being Fish factories, Urban markets, semi-urban and rural communities, fishmeal factories, Hotels and restaurants within the country and, regional and international export markets.

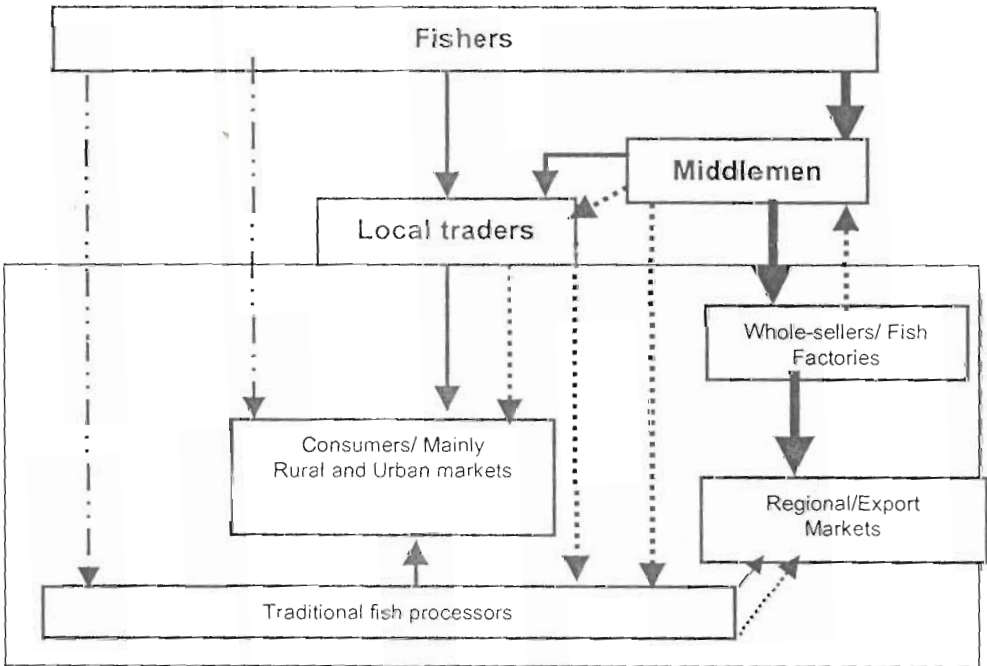


Fig. 9.4.2 a: Marketing structure for Nile Perch

.....➔ Signify the flow of reject fish or Nile perch scrap from factories
 - - - - -➔ Signify the flow of mainly immature Nile perch from very poor fishers
 NB: The thickness of the line denotes the intensity of fish flow.

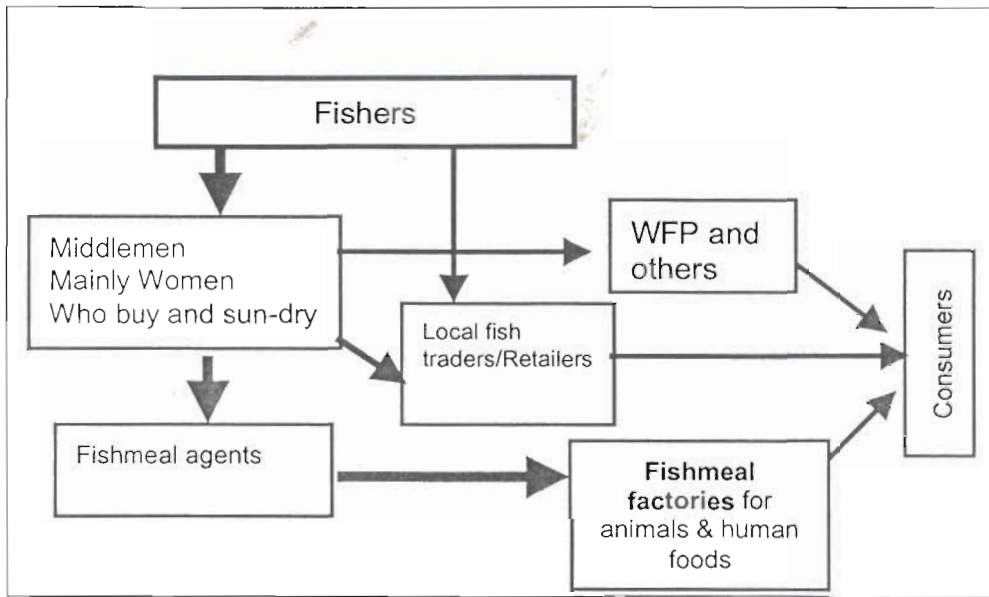


Fig. 9.4.2 b: Marketing structure for *Mukene*

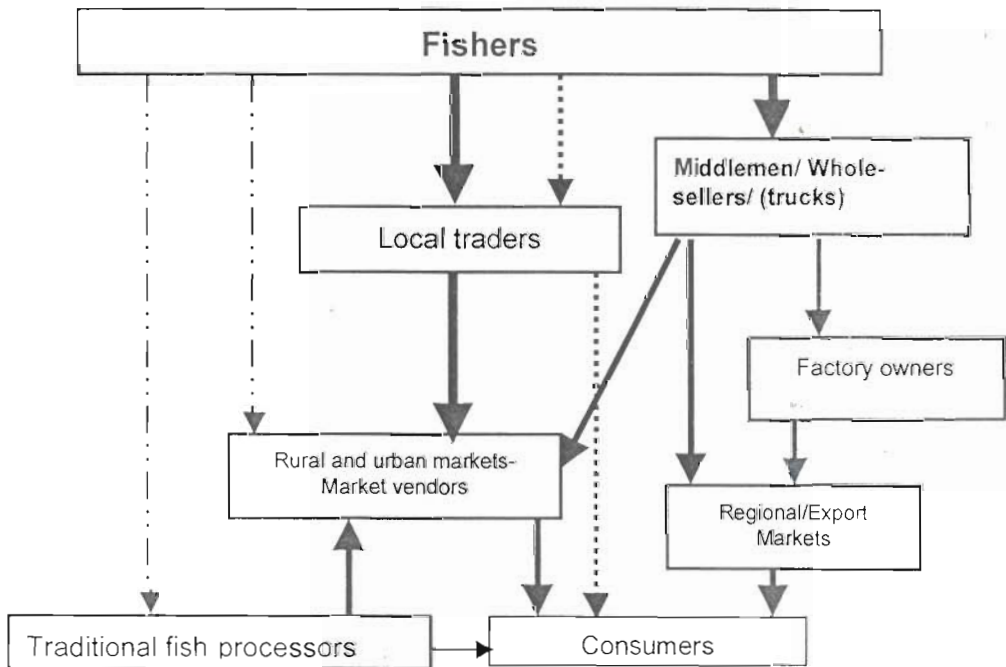


Fig. 9.4.2 c: Marketing structure for Nile Tilapia



Signify the flow of reject fish



Signify the flow of mainly immature Nile Tilapia from very poor fishers

NB: The thickness of the line denotes the intensity of fish flow.

Middlemen and local fish traders constitute the main links to the fishers. Most fishers sell their fish catch to local market traders and to middlemen with just a few supplying their fish directly to fish factories and least to local fish processors. Along the marketing chain there are several links of varying intensities such as wholesaler/fish factories, traditional/local fish processors, fishmeal agents, World Food Program and small-scale retailers who buy and link up to consumers.

In the marketing chain for Nile perch fish factories/wholesaler are connected back to the middlemen by the flow of fish scrap ("Mugongo wazi" a swahili translation for "just backbone") and other fish by-products or rejects from processing plants which are then sold to local traders/retailers for local consumption. Sometimes the fish rejects or by-products from fish factories are traditionally processed and sold to regional markets.

Supply Arrangement by Fish Processing Factories

Most fishers on Lake Victoria believe that the fish supply arrangement by factories is moderate and commensurate with the prevailing fish demand. However, other fishers are skeptical about the fish supply arrangement and believe that it has ultimately resulted in less fish supplies by fishers due to increased fishing effort, over exploitation and decreasing catches. Some fishers still think that the quantities of fish supplied by them have increased as a result of the supply arrangements by factories.

The supply arrangement of Nile perch impacts on fish sales by way of prices and quantities supplied in that prices considerably influence the quantities supplied to factories, which affects price stability and induces competition from buyers. The supply arrangements according to fishers have resulted in good and prompt sales. Thus, fishers are able to sell-off all the catch promptly on cash basis.

Some fishers however, believe the fish supply arrangements by factories are largely unfair, unreliable, characterized by cheating and do not support fishers to directly sell fish to factories. According to fishers, factory owners normally set prices and are responsible for price manipulations and fluctuations. Nile perch price is relatively higher compared with other fish species especially tilapia in Lake Victoria. This influences prices of other locally consumed fish like tilapia making it difficult for local people to afford fish.

Almost all the fish factories in Uganda procure fish through agents/middlemen because they consider fishers as unreliable and ineffective to operate with. Moreover, the risks of transportation of such a perishable commodity like fish in a country where transport infrastructure is still poor and distances are far apart between production areas and fish-processing plants reinforces the factory owners' justification for not dealing with fishers directly. Factory owners argue that faced

with the realities of the market place, and the consumers' demand for quality at the lowest price and the competitive pressure of rival firms, they are forced to pursue cost-efficient business strategies. While such strategies entail many facets of production engineering and management organization, they also entail obtaining factors of production and other business and marketing-related services at the lowest cost possible.

Industrial Fish Processing- Capacity and Outputs

The fish factories in Uganda are owned on partnership or sole basis by different nationalities, which include Ugandans, Kenyans, Koreans, Saudi Arabians, Indians and Dutch. Most factory owners have extensive professional experience in the fish processing business and; a few have only some relevant training in the business. All the fish factories deal in Nile perch processing which is on demand in the overseas export market; commands a good price and is available in good supply making it convenient for exportation. Some few factories process Tilapia in addition to Nile perch.

Changes have taken place in the industrial fish processing sector and the capacities of factories and their real output per day from the year they started processing to 1999 (Fig. 9.4.3).

There has been a general growth in capacity and in real output for the factories over the recent years. Some factories such as A, B, E, G and H, performed poorly or maintained the same level both in capacities and daily output whereas C, D and F registered a big growth both in capacities and daily output. This was most probably because the former were still updating and improving on their status in response to the EU fish ban.

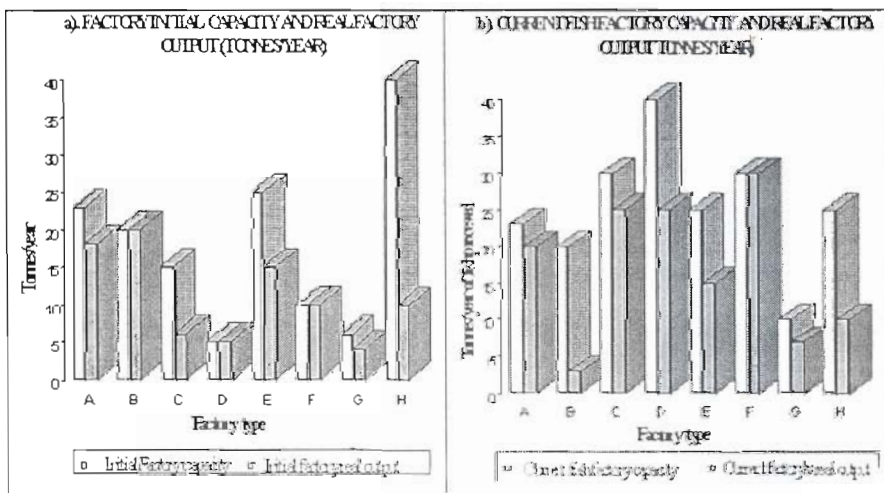


Fig. 9.4.3a & b: Initial and current capacity and real output

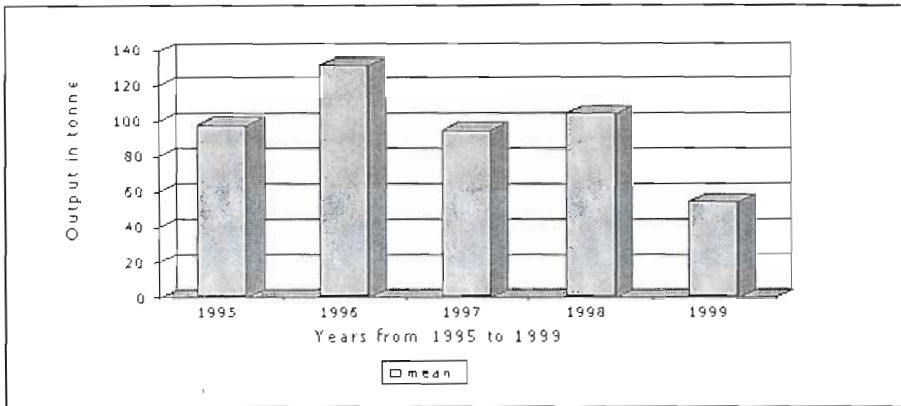


Fig. 9.4.4: Average fish output per week from fish processing factories, 1995 to 1999.

There was a decline in the volumes of fish processed from 1995 to 1999 (Fig. 9.4.4) because of the same reasons affecting factory capacities and outputs as mentioned above. These factory production trends have since shot up with improved factory quality standards and increasing global demand for fish.

Fish factories in Uganda export about 2500 tones of Nile perch per month, which is only 50% of the existing capacity. The excess capacity is mainly due to the difficulty factories face in getting adequate fish supplies, although some of them also have constraints related to marketing, fish quality and under-financing. Besides fillet, the plants also produce frames (skeletons), fish maws (bladder), fish oil and skins for various markets. Fillet and maws are exported to several countries overseas. There is however already a potential local market for much of the exported Nile perch.

Most of the fish frames produced by factories now go for fishmeal. Similarly about three quarters of the catch of a small sardine-like fish, mukene, goes for fishmeal. The demand for both products in the local market for human consumption is high and unsatisfied. Therefore Nile perch frames and mukene going for fishmeal is directly in conflict with food security requirements for local people. Because of the strong demand for fishmeal, the price of fish frames (Plate 9.4.2) and mukene has risen beyond what most consumers can afford. The industries also draw away fish and fish products from the traditional processing sectors, thus causing unemployment, which outweigh the new employment opportunities created in the modern sectors.



Plate 9.4. 2. Fish frames, the main by-products sold in the local market

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Local Fish Processing and Marketing

Artisanal fisheries catches are marketed fresh or processed in line with consumer taste, storage conditions and; supply and demand. The lack of a highly developed cold storage and marketing network makes fresh and frozen fish distribution to the inland population in the country difficult. In Uganda, cold-storage systems are either lacking or inadequate and fish not sold the same day is either dried or smoked. However, more than 80% of the fish is sold fresh, about 10% is salted/dried and 8% smoked. There is an increasing tendency to sell the fish captured by artisanal fishers in fresh form due to an increased availability of ice, together with increased demand from fish factories. There is also a growing trade among neighbouring countries in the Lake Victoria region due to the same reasons together with improved co-operation between countries. The main trade flows are: The DRC, Rwanda and Kenya. The processing methods used are mainly traditional ones dominated by women, though improved technologies are being introduced and gradually adopted. Different techniques of smoking fish exist and are based on tradition, preferred tastes and market preferences. The main products processed and traded include dried mukene, smoked catfish and smoked tilapia. Other traditional forms of processing are sun-dried, dried-salted and fried.

Factory owners indicated that the sizes of fish processed were mainly determined by specifications of the export market and the legal obligations, which emphasize non-exploitation of immature fish. It is difficult for factory owners to agree that they buy immature Nile perch though personal observations (October 2001) from various landing sites on Lake Victoria showed that all factories were buying fish of less than 2 kg. This had come about due to the increasing demand for Nile perch for export resulting from the lifting of the fish ban by EU countries.

Fish agents / Middlemen

Fish agents act on behalf of the fish processing factories by buying the fish from fishers and then supplying the same to the factories. Most of the fish agents are influential and powerful. Many own outboard engine boats and vehicles for fish transportation, while some own canoes and nets and employ fishers. Many times the fish is bought in the lake and brought directly to the factory.

As a go-between for the fishers and fish processing factories, the fish agent is in a position to exploit the fisher. Instead of buying fish at the agreed price (agreed between the agents and the fish processors), upon reaching the beach, the agents set their own buying prices, which in most cases are lower than the agreed prices; they then retain the balance. The situation worsens when there is only one agent buying fish at the beach. According to some fishers interviewed; 'on seeing the catch, the agent behaves as if he is not interested at all'. By displaying this attitude the fisher becomes helpless and the agent sets his own price. The fishers are forced to sell at that price to avoid the loss, since fish is highly perishable. Some narrated the kind of frustration they had undergone through the agents: *'These people are so connected with the factory management to the extent that if you take your fish directly to the factory, by-passing them either you will not enter the factory, but if you enter, then much of your fish will be declared "reject" and hence sold at a throw away price'*.

Arrangements are sometimes made between individual agents/factories and fishers, in which the agents either employ the fishers or provide them with fishing equipment on credit and in return, the fishers supply fish to the agent and in the process pay back the loan. This strong patron-client relationship is geared towards serving the interests of the factories and agent. By establishing tight control of the fishers who, in many cases are forced to supply them with fish, many fish agents have undermined the role of the fishers' co-operatives. They have become constraints for community participation in the marketing of the fisheries. This system of fish marketing resulting from the Nile perch export trade, benefits mostly the factory owners and their agents, although most boat owners and fish traders believe they have also benefited from the market (Table 9.4.1.).

Socio-Economic Implications

Nile perch was the main target commercial fishery is the one driving the fish industry with prices rising and stabilizing in phases. For example, many powerful people in the fishery business consider the Nile perch a savior, not an ecological disaster, since the lake is still producing record numbers of perch that are bringing in badly needed foreign exchange.

Table. 9.4.1: Fishers' attitudes towards fish factories in Uganda.

-Statement of fish factories	CATEGORIES		
	Agree	Dis agree	Not sure
Created employment	71	9	5
Provide credit to fishers	20	44	21
Provide good market for fishers	82	1	2
Helped improve fishers' income	73	9	3
Educate fishers on fish handling	25	52	8
Deprive fisher livelihood by unfair supply arrangement	35	34	16
Are responsible for illegal and bad fishing practices	21	58	6
Deprive locals of their food fish	19	62	4
Fish factories increase likely to deplete fish	28	49	8

The strategies they use to procure fish combine making credit available to fishers in return for regular supplies, boat engines and collection boats, and resident agents on larger beaches. Even though there was no recorded competition between processing plants and local traders for fish during the time of this survey, accounts of cases where competition is augmented by demand during times of scarcity were noted as also observed by Gibbon (1997) about the developments in Nile perch markets on the Tanzanian side of Lake Victoria. Gibbon describes how industrial fish processors managed to win control of the fish market by using fish agents, offering higher prices for fish and supplying vessel owners with gear, an arrangement that was associated with increases in fish supply.

This research has shown that industrial fish processors in Uganda are presently the main link between the artisanal fisher-folk and the overseas export markets. They have helped stabilize fish prices; and expanded the fish market for artisanal fisher-folk, which has led to increase in their average earnings. There have been changes in the distribution of wealth resulting from the Nile perch fishery, different

from that of the original artisanal fishery. Most local fishers interviewed actually consented to doing well as a result of the Nile perch boom though large-scale operations that exploit the Nile perch for foreign currency were doing much better (Table 9.4.1). It was found that more quantitative and qualitative transformations in capital flows in the fisheries sector emerged and accelerated faster in mid 1990s. Significant investments were made by many "artisanal" vessel-owners, independently of the gear and engines supplied to them by the factories. These sharply rising investment levels were accompanied by a steep increase in full time equivalent fishers and auxiliaries (except "artisanal" processors) and, a more than corresponding increase in total real income to the artisanal sector as a whole (much of which has been ploughed back into the industry). Most fishers reported improvement in incomes, assets and living standards to good changes in the market (see Table 9.4.2) as noted from their responses when asked about major changes since 5 years ago.

Table 9.4.2: Major changes in the last five years

Changes in the fishery	Frequency	Percent
Income of fisher communities have improved	60	39.5
The fish market has greatly improved	58	38.2
Fishing effort has shot up	13	8.6
Local processors have reduced	4	2.6
Increase of illegal gear and destructive fishing	11	7.2
Reduced destructive fishing and illegal gear	6	3.9
Total response	152	100.0

Improvement in standards of living according to fishers (76%) is evidenced from increased incomes and local investments in form of houses, other assets, and increased capital for fishing (Fig. 9.4.5). These fishers indicated that they have been able to acquire land, build houses, marry and raise children plus the basic requirements while others have acquired vehicles and other income generating activities like shops, etc.

On the contrary, most fishers suggested that their major concern was the need to stabilize the fish market, establishment of credit facilities and good governance on the part of government fisheries officials. However, observed that the crew (real fishers) and traditional fish processors were marginalized and poor in reality unlike the boat owners, which this study targeted.



Fig. 9.4.5: Perceptions on impact of industrial fish processing boom on local fishers' living conditions.

Implications for Food Security

Fish protein requirements for fisher-folk communities in Uganda are not seriously affected by the Nile perch export trade in spite of protein malnutrition fears in the lake basin as expressed by socio-economists especially on the Kenyan side (Mugabe *et al.*, 1999). The explanation to this is that fishers in Uganda normally have easy access to cheap fish at prices much less than urban prices (about 50 % less), and due to dependency on alternative fish species of less international value (Tilapia, lungfish, mukene, cat fish, etc.) by fishers. Moreover, the prices at landing sites, urban markets and export markets are generally in the range 1:2:7. This situation may rapidly change. Given the greater exportability of fish and increasing demand from fish factories, it is possible that the rural consumers are receiving less fish than before the fish export drive. The dramatic increase in fish exports promoted by higher export prices and favorable exchange rates and the attractive markets in the urban centers are the underlying factors to the diversion of fish demand and supply.

Local Fish Demand

The demand for Uganda fish, according to government sources (Fisheries Master Plan 1996), was divided into five market segments as for 1995-1996. The rural fish markets take up to 55 % followed by urban fish market (16 %), and export market (14 %). Subsistence consumption by fishing communities and fish farmers was estimated (11%) and regional markets (3 %). This again concurs with the

findings that most fish is sold to local market traders by fishers. In Uganda, fish prices fluctuate following the law of supply and demand. Two distinct markets prevail: the Tilapia and mukene, that is of low market value, and the Nile perch that targets customers with a relatively higher purchasing power, and for exports. The price of mukene and Tilapia captured by artisanal fishers varies seasonally in relation to their abundance. It is cheaper than meat, while higher valued species show a price near to that of meat. Moreover, the fish species preference for most people is Tilapia (70 % for the whole lake region) against Nile perch (SEDAWOG 1999). In general, as far as the product form is concerned, prices of fresh fish fluctuate more than fish in other forms. The volume of the catches of fish species of less global value i.e. Tilapia and Mukene has more direct implications for the food security particularly of urban poor and rural communities. These species are most economically caught, handled and distributed in large quantities and are thus suitable for urban markets and rural communities.

Implications for the Fisher-Folk Communities and the Lake's Sustainability

In 1996 the total commercial catch of fish from Lake Victoria was 106,400 tons of which 13,650 tons was exported (Namisi 2000). In 1997, the total commercial catch almost stagnated at 106,800 tons of which only 11,580 tons were exported. By 1998 the total catch was 105,200 tons and the exports went down to 10,530 tons. These figures show a small but steady decline in the fish harvest from the lake, which until that point had been increasing. The poor subsistence fisher-folk communities of Lake Victoria who rely on fish for their daily food requirements lose out as demand and prices increase. Usually the price of Nile perch greatly influences the price of other fish species like Tilapia. Whenever, the price of Nile perch goes up that for other fish automatically goes up too. This means that as prices are hiked by the export market, the domestic consumers and some fisher-folk communities become vulnerable to the high prices, which they cannot afford. Odongkara and Okaronon (1997) expressed fears that expansion of export-oriented fishing industry for Nile perch was likely to drive the cost of the fish beyond the reach of many fisher-folk communities. The findings of this study confirm the steady rise in fish prices (Namisi 2000) ever since the international fish market was established in early 1990s. Already some domestic consumers have resorted to alternative low priced fish consisting mainly of juveniles. This in turn is encouraging fishers to use illegal gear. Fishers acknowledge that they use this type of gear because it is affordable compared to the legal gear. This is a more ill fated activity for the sustainability of the fishery resource. When hard pressed by the need to survive and sustain the family the fishers will have no alternative but to fish regardless of the stress put on the resource. Widespread poverty within the

population plays a significant role in environmental degradation (Pinstrup-Andersen & Pandya-Loch 1996). It is particularly difficult for poor and hungry people to make the critical trade-offs necessary for long-term sustainability of natural resources because of their pressing immediate needs.

Conclusions and Recommendations

- a) The fisheries sector plays an important role in food security through provision of supplies of fish, the provision of employment opportunities especially for the rural poor fisher-folk communities and in its contribution to economic growth. The rapid growth in fish exports has remarkably enhanced fishing effort (fishers and gears) and competition.
- b) The significant increase in fish exports in the last decade was influenced by the boom in Nile perch fishery and international fish demand, which resulted in increases in real prices and stimulation of investments in industrial fish processing for export and boosted domestic fish market trade.
- c) Many fishers have benefited from the boom in terms of employment, income, and living standards but some groups of fishers (crews, baria), traditional fish processors and poor fisher-folks have lost out. Deprived of work and unable to afford this higher priced fish, some local people face a serious economic threat.
- d) Although most fishers felt contented with the fish market arrangement, the fact that fishers lack any serious organization leaves them vulnerable to fish agents and fish traders who 'exploit' them by giving low prices.
- e) Local demand for fish seems stable among the fisher-folk communities but with the continual steady growth in the fish export industry, the local demand will most likely suffer as prices hike.
- f) Equity concerns should be addressed by government, NGOs and other service providers to ensure that women, traditional fish processors, fishers/boat crews and poor fisherfolk communities are helped financially, and by promoting diversification into other economic activities.
- g) Sustainability concerns need to be taken seriously and addressed through, amongst other approaches, co-management arrangements including fishers, Government (as well as wider co-operation between the three countries sharing the lake) and, the private sector in the form of the processors.
- h) In spite of some partial economic optimism by fishers as expressed from the results of this study, the worries of many fishers about their catches becoming sporadic and fish smaller should be taken seriously. The day-to-day operational reality of the artisanal fishing community should form the basis for a precautionary approach where science-based construction of reality is scanty.