RESEARCH REPORT

GLOBALISATION AND FISH UTILISATION AND MARKETING STUDY

ECONOMIC PROFILES OF SELECTED LANDING SITES ON LAKE VICTORIA

SOCIO-ECONOMICS SECTION

FISHERIES RESOURCES RESEARCH INSTITUTE

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ACRONYMS

AFO	Assistant Fisheries Officer
DFID	Department for International Development
DFO	District Fisheries Officer
DFR	Department for Fisheries Resources
DRC	Democratic Republic of Congo
EPRC	Economic Policy Research Centre
EU	European Union
FIRRI	Fisheries Resources Research Institute
LVEMP	Lake Victoria Environmental Management Project
MFPED	Ministry of Finance, Planning and Economic Development
NARO	National Agricultural Research Organization
PAF	Poverty Action Fund
UBOS	Uganda Bureau of Statistics

DEFINITIONS

Mosquito net	A small-mesh net used for catching mukene.
Mukene	A local word for the small pelagic fish caught using light and scientifically called *Rastreneobola argentea*
Parachute	A term used to refer to a three-planked small boat with a flat bottom manually propelled
Ssesse	A local word widely used to mean a V-shaped boat with definite angles and a keel.
Trolling	A fishing method that involves dragging a baited hook from a moving boat.

EXECUTIVE SUMMARY

General

1) The objective of the study is to examine the impact of development of the export fishery on the poor. The report focuses on the economic structure of fish landing sites, providing data relating to the livelihoods of artisanal fish producers, processors, traders and consumers, in particular data relating to income and revenue flows.

2) The study was conducted at six beaches, namely Dimmo, Kasenyi and Bwondha which were regularly accessed by factory trucks and Saanya, Buwanzi and Bumeru (B), which were not accessed by the trucks but may be reached by factory/boat agents.

3) Some beaches like Dimmo and Kasenyi in Masaka and Wakiso Districts respectively have had refrigerated trucks for nearly ten years while at others like Busiro and Wakawaka in Bugiri District they arrived barely one year ago.

4) Factory trucks operate at selected beaches as authorized by the district authorities, where the supply of Nile perch is good and the required infrastructure exists. However, some trucks are reported to operate from un-authorised beaches in search for fish supply.

5) Insulated boats serve to collect Nile perch from islands and beaches without trucks and deliver to the refrigerated trucks or direct to the factories.

6) There are also other trucks collecting tilapia for export to the regional markets, notably Rwanda and Kenya.

7) There is better keeping of statistics by the authorities at beaches served by refrigerated trucks than at the other beaches.

8) The districts have benefited from increased revenues attributed to the presence of refrigerated trucks and vessels at the beaches. Sources of revenues include specific tax charged on trucks and vessels and market fees earned through tendering of the beaches. The Statutory Instrument No. 73 “The Fishing (Amendments) Rules” of 2001 has revised the rates and decentralized the collection to the districts.

9) Policies regulating the activities of fish exporters are generally made by the Central Government. However, district authorities have facilitated fish export activities by improving on infrastructure like roads, fish handling facilities and hygiene and by availing inspectors. No similar developments were seen at the other beaches visited.

10) In response to the negative impacts of fish export on the artisanal processors, traders and consumers, the districts are promoting aquaculture development to meet the domestic demands.

11) There are more facilities and infrastructure in support of fish production and marketing at beaches with refrigerated trucks than at the other beaches.

Fish Production

12) Investment requirements for the Nile perch fishing units, consisting of boats, engines and gears, are considerably higher than those for the tilapia and mukene units. Therefore, some fishermen have adopted low-cost fishing methods for Nile perch, namely trolling and long lining.

13) The average cost of Ssesse boats at beaches with refrigerated trucks is Shs 404,648 while at the other beaches visited, it is 292,250. The average cost of parachute boat at the beaches without the trucks is Shs 80,612.

14) At beaches with refrigerated trucks, owners of most fishing units employ hired labour to operate their boats because they own more than one boat and they can afford to pay them. At the other beaches, however, most owners go out fishing on their boats as they have only one boat and they cannot afford hired labour.

15) At the beaches with trucks, the labourers earn higher incomes but because they are paid a 'percentage of net venue', they operate at a higher risk than their counterparts at the other beaches where they are paid a 'proportion of gross revenue'.

16) Motorized fishing units have the highest catch rates. However, among the non-motorised fishing units, trollers had the highest Nile perch catch rates and hence net revenues, followed by long line and gillnet fishing units.

17) The price per kg of Nile perch almost triples that of tilapia, reflecting the high Nile perch export demand.

Processors

18. The most common type of fish processing at the beaches is sun-drying of mukene, with limited cases of smoking and deep-frying of other species.

19. The absence or small number of fish processors at the beaches is attributed to little or no supplies of fish as a result of competition from factory trucks.

20. Nile perch processors reported low profit levels and in some cases losses due to the limited quantities processed, largely attributed to competition for fish supplies with fish exporters.

21. Local processors obtain supplies of Nile perch at prices considerably lower than those paid by factory agents because they buy low quality fish, namely rejects and juveniles.

22. Local fish processors are the most vulnerable socio-economic group as indicated by their lowest disposable incomes and fish consumption levels compared to producers and traders and the continuous threat from industrial processors.

Fish Traders

23. A few traders have invested in fish marketing assets, namely boats, trucks and bicycles. However, apart from bicycle traders, many traders interviewed did not own assets but hired them.

24. There has been a noticeable decline in number of bicycle traders from the beaches with refrigerated trucks.

25. Different types of agents have emerged at the beaches with trucks, acting as middlemen between the producers and the refrigerated trucks/factories. This is attributed to the difficulties faced by producers when attempting to deal directly with the factory trucks/factories (mistrust, cheating and defaulting on payment for credit deliveries).

26. Only a small proportion of local traders deal in Nile perch because they cannot compete with factory trucks in securing raw supplies of the fish. The few traders who buy Nile perch pay significantly lower prices than those paid by factory agents because they trade in low quality fish (rejects and juveniles).

27. Apart from factory agents, pick-up traders constitute another major category of local traders because they deal in tilapia and supply urban areas where market prices are high.

28. Nile perch prices at beaches with factory trucks averaged Shs 2,100 per kg. compared to Shs 1,800 at beaches without trucks.

Consumers

29. Consumers were distinguished between those who engage in fishery activities and those who do not, with the former hardly buying the fish they consume. Both categories commonly consume tilapia, even at beaches where Nile perch is the most landed species. This is attributed to preference or to the fact that Nile perch fetches better prices and is, therefore, put for sale rather than consumption even by Nile perch producers.

30. Most consumers reported that the quantities, size of fish and the frequency of consumption have decreased over the last one year.

31. Most consumers reported that the prices of fish for consumption had increased over the last one year.
32. The most common substitute for fish reported was beans, followed by vegetables.

Perceptions to Chilled Facilities

33. Producers associate the factory trucks with positive impacts, namely increased fish prices, ready market for fish and employment opportunities for the youth at the beaches.

34. Artisanal processors, traders and consumers associate factory trucks with negative impacts, namely high prices on fish and competition for fish supplies

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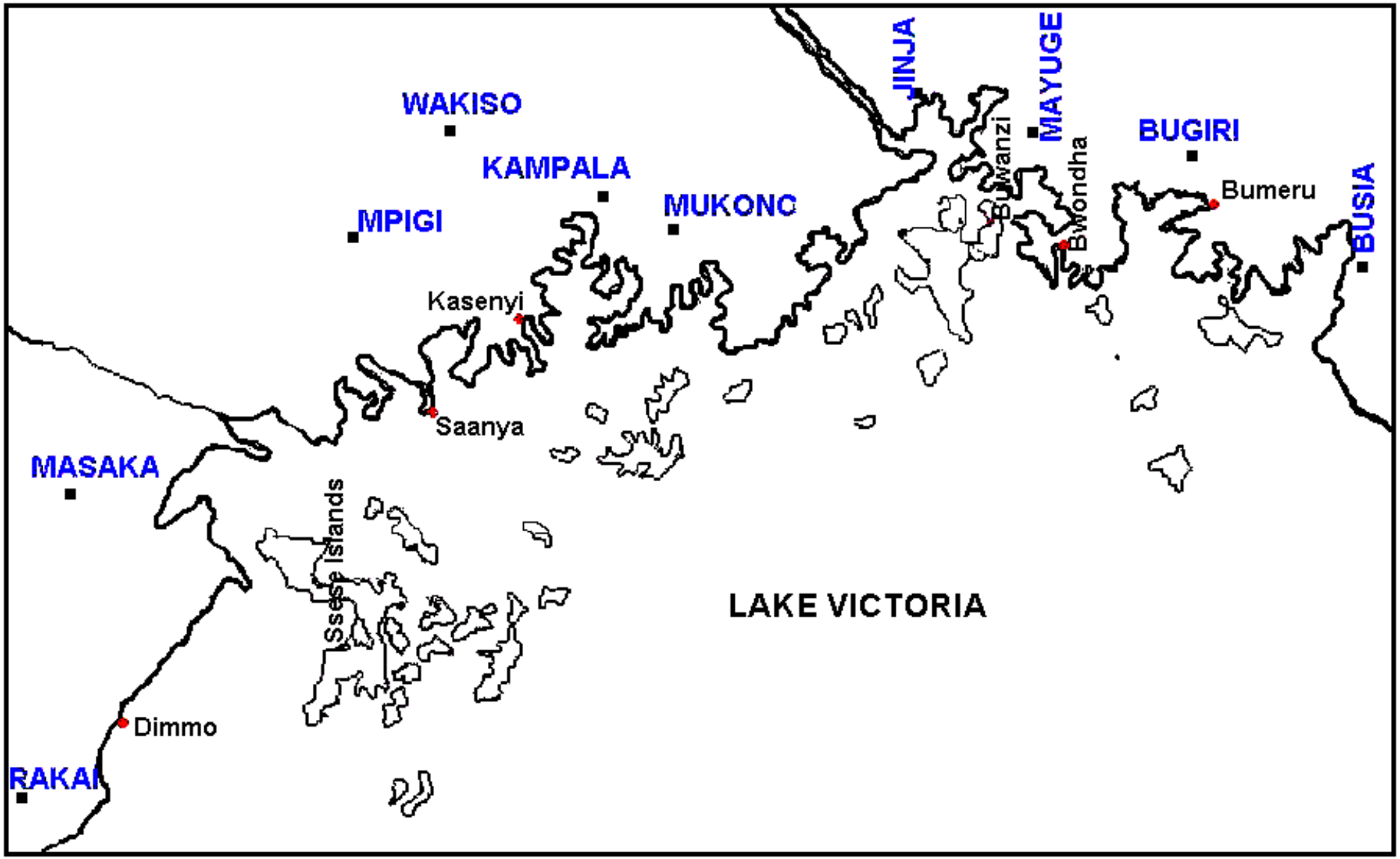

Fig1.1. Map of Lake Victoria Uganda, showing Riparian Districts and selected landing sites

ECONOMIC PROFILES OF SELECTED LANDING SITES ON LAKE VICTORIA

1. INTRODUCTION

The Globalisation and Fish Utilisation and Marketing Study is a collaboration between the Fisheries Resources Research Institute (FIRRI) and the Mike Dillon Associates Limited, with funding from the Department for International Development (DFID) of the Government of the United Kingdom. The study is designed to examine the impact of the development of the export fishery on the fish producers, processors, traders and consumers in the artisanal fishery in Uganda. FIRRI's role is to collect field data relating to the livelihoods of artisanal fish producers, processors, traders and consumers, in particular data relating to income and revenue flow. The initial focus is on the economic structure of fish landing sites.

During the first quarter, namely April to June, 2002, work was carried out on Lakes Kyoga and Albert and a report produced. During the second quarter, July to September, 2002, Lake Victoria was covered. In both phases, the focus has been on the economic structure of fish landings.

1.1 Objectives

The objective of the research is to develop a sector-wide model and detailed models of selected landing sites on Lakes Victoria. The specific objectives are as follows:

i) Identify six landing sites on Lake Victoria using the selection criteria described in the methodology section below.

ii) Identify discrete economic sub-sectors within the artisanal sector for analysis.

iii) Collect data on individual or household incomes and costs and revenues of economic units, both aggregate and individual, for the landing sites sampled.

iv) Prepare a research report on each landing site.

v) Plan the continuation of the data collection process into the next quarter.

The purpose of this document is to provide research reports on each of the landing sites at which the research was conducted.

1.2 The Policy Framework

Globalisation of the fisheries has been established as a result of policies introduced under Uganda's structural adjustment programme. The key policies include privatization, liberalization and investment promotion. The policies have different implications for the livelihoods of small scale fishery operators and fish consumers.

The privatisation policy was intended to transfer the ownership of business enterprises from public to private hands for greater efficiency (EPRC 1999). Its effect within the fisheries was that Government withdrew from its earlier role of supplying inputs, which had moderated their prices to the fishers. Fishers are now faced with the full market prices for outboard engines and fishing gears, some of which could be beyond their reach.

The market liberalisation policy reduced controls over the domestic as well as the export trade, aimed at creating a conducive environment for business. Although this led to increase of fishery inputs on the market, the policy resulted in rises in foreign exchange and interest rates, resulting in higher costs for imported inputs and of interests on loans (MFPED 2000, UBOS web site). Liberalization policy has led to

the export of substantial quantities of fish, with implications for domestic traders and consumers.

The investment promotion policy, laid down within the Investment Code of 1991, was aimed at encouraging private investment through tariff reduction and provision of tax incentives (Government of Uganda 1991). Other provisions included relaxation of restrictions on profit repatriation for foreign investors and assurances of the security of their assets against any forms of expropriation. The policy, in conjunction with the other measures, has stimulated rapid growth of industrial fish processing capacity on Lake Victoria.

There is need to study and establish the impacts of these policies on the livelihoods of the poor people with respect to the earnings to fishers, creation of jobs and the effects of greater foreign exchange earnings for the country. Issues of the high levels of investment in boat, gear and engine required for fishing *L. niloticus* for export and the implications for the participation of the poor need to be examined. Other concerns include the competition for fish supply that result in loss of livelihood opportunities to artisanal processors and traders (Abila & Jansen 1997). Fish export would also deprive many domestic consumers of a source of fish due to the high prices created. This would lead to increase in demand for juvenile fish, thus posing a major threat to the sustainability of the fisheries resource, leading to further poverty among the fishers (Odongkara 2001). Through export trade, fishers are exposed to external risk over which the country has little control. Fish price increases provide condition for influx of people to the landing sites, creating sanitary and health problems.

1.3 Model Specification

This study seeks to develop an input-output model to relate income, the dependent variable to key independent variables, namely boat, gear, labour costs and other factors. Income is itself derived from quantities of fish produced and prices at which they are sold.

Availability of chilled transport facilities would affect income through the relevant variables, namely fish prices, availability of capital equipment, infrastructure and others to be established by the research.

A relationship between availability of chilled transport facilities and earnings would be established from the data. This is done by comparing earnings between the different categories of landing sites as well as infrastructure and facilities and the perceptions of the enterprise operators towards the chilled transport facilities.

1.4 Methodology

1.4.1 Study Area

The study was carried out at six beaches within six districts on Lake Victoria. The eleven riparian districts were divided into the three ecological zones so as to ensure that the study was well spread throughout the lake region. It also enabled selection of respondents from both ‘rural’ and ‘urban’ beaches. The districts were also grouped on the basis of spatial location. Below are the zones with their corresponding districts:

Zone 1 – Rakai, Masaka, Kalangala, Mpigi

Zone 2 - Wakiso, Kampala, Mukono, Jinja

Zone 3 - Mayuge, Bugiri, Busia

In every zone, two landing sites were selected on the basis of the following criteria:

a) One landing site regularly accessed by factory trucks

b) One which was not accessed by fish factory trucks although may be accessed by factory/boat agents

The two landing sites would come from different districts in each zone.

Table 1.1: Selected Landing Sites

Selection Criteria	Zone 1	Zone 2	Zone 3
Landing sites accessed by factory trucks	Dimmo in Masaka District	Kasenyi in Wakiso District	Bwondha in Mayuge District
Landing sites not accessed by factory trucks	Ssanya in Mpigi	Buwanzi in Mukono District	Bumeru A in Bugiri District

1.4.2 Economic Sub-sectors

The relevant enterprises under the production, processing and marketing were identified and examined, as listed in Table 1.2 below:

Table 1.2: Fishery Enterprises by Sub-sector

Sub-sectors	Discrete Enterprises/ Categories
Production	Gillnetting
	Long lining
	Mosquito seining
Processing	Smoking
	Sundrying
Marketing	Bicycle trader
	Pick-up trader
	Boat trader
	Factory agent
	Processor / trader
Consumption	Consumers not engaged in fishery activity
	Consumers engaged in fish production
	Consumers engaged in fish processing
	Consumers engaged in fish trading

1.4.3 Sample Selection

The relevant fisheries sub-sectors were identified. Within each sub-sector, the available owners/ renters of fish production, fish processing and fish marketing units were interviewed.

1.4.4 Data Collection

Data collection involved the following activities:

i) Literature review of reports related to the study.

ii) Relevant records and reports at the district headquarters of Masaka, Mpigi, Wakiso, Mukono, Mayuge and Bugiri were examined.

iii) Key informant interviews were carried out with Department for Fisheries Resources staff and beach leaders.

iv) Interviews were carried out with persons representing the enterprise units within the identified sub-sectors by means of a unit questionnaire.

The team spent one day at each of the relevant District headquarters meeting with district officials and reviewing records and reports. Thereafter, it proceeded to the beaches and spent 4 days on data collection at each of the large beaches served with chilled facilities and 3 days at the other beaches.

The variables covered under data collection at the aggregate and individual levels are given in Tables 1.3 and 1.4 below:

Table 1.3: Aggregate Level Data

Sub-sector	**Information**
Production	Infrastructure and facilities Production facilities Categories of fishers Number of persons employed Boat types and numbers Engine types and numbers Gear types and numbers Catch statistics
Processing	Infrastructure and facilities Types of fish processors Species processed Processing assets
Marketing	Infrastructure and facilities Fish handling facilities Weighing scales Transport services Water supply Iceboxes Availability of latrines Numbers of traders by type Species traded Main destinations

Table 1.4: Unit Level Data

Sub-sector Enterprises	Variables
Production	Personal characteristics Capital inputs and costs Labour inputs and costs Entrepreneurship costs Other costs Resource perceptions Catches and prices Sales data
Processing	Personal data Capital inputs and costs Labour inputs and costs Other inputs and costs Entrepreneurship costs Species, quantities and prices of fish processed and sold
Marketing	Personal data Capital inputs and costs Labour inputs and costs Transportation costs Ice/storage costs Entrepreneurship costs Species, quantities and prices of fish bought and sold
Consumption	Fish species commonly eaten Frequency of consumption Prices and quantities Substitutes for fish.

1.4.5 Data Analysis

Both qualitative and quantitative data were collected. The qualitative data were analyzed using frequencies whereas the quantitative data was first transformed to derive the target variables, which were analyzed using descriptive statistics particularly the mean. The SPSS Version 10.0 program was used in the data analysis.

Overall Table for L. Victoria, Fish Production sub-sector

	Paddled longlines-Nile perch	Paddled trollers-Nile perch	Paddled gill netters-Nile perch	Motorized gill netter-Nile perch	Paddled gill netter-Tilapia	Mosquito nets-Mukene
N= 132	31	7	17	34	36	7
Investment	119,785	155,193	966,397	5,437,353	182,569	1,040,000

Hire of boat	1,265	0	1,043	346	1,322	0
Hire of engine	0	0	0	2,951	0	0
Labour	57,242	47,698	26,361	70,054	18,120	24,901
Fuel	0	0	0	138,255	0	38,219
Bait	21,895	1,629	0	0	0	0
Boat maintenance	828	167	542	1,132	959	1,500
Gear maintenance	452	0	0	275	519	2,667
Engine maintenance	0	0	0	3,363	0	0
Other costs	0	0	0	1,482	0	1,233
Operating costs	**81,681**	**49,493**	**27,946**	**217,858**	**20,920**	**68,520**
Depreciation	1,950	504	11,600	46,033	4,188	27,287
Total costs	**83,631**	**49,998**	**39,546**	**263,891**	**25,108**	**95,807**
Quantities landed	86.84	61.92	42.85	143.04	60.28	452.21
Price/ kg	1,713	1,843	1,521	2,031	690	310
Gross revenue	149,464	113,450	70,937	291,185	42,352	113,612
Net revenue	**65,833**	**63,452**	**31,392**	**27,294**	**17,245**	**17,805**

Overall Table

	Smoking- Nile perch	**Smoking- Tilapia**	**Drying- Mukene**	**Frying- Nile perch**
N= 19	12	1	1	5
Investment	50,857	7,000	.	3,500
Hire of smoking kiln	280	0	1,307	0
Firewood	2,508	2,000	0	5,700
Oil	0	0	0	10,920

Maintenance of smoking kiln	389	0	0	0
Labour	3,364	1,867	0	373
Operating costs	**6,541**	**3,867**	**1,307**	**16,993**
Depreciation	88	67	0	97
Total costs	**6,629**	**3,934**	**1,307**	**17,090**
Quantities processed	14.25	100.00	30.00	29.00
Buying prices/ kg	642	600	600	900
Selling prices/ kg	896	750	1,000	1,420
Cost of raw fish	9,292	60,000	18,000	26,800
Gross revenue	12,917	75,000	30,000	43,300
Net revenue	**-3,004**	**11,066**	**10,693**	**-590**

ZONE 1

2. DIMMO LANDING SITE

2.1 Background

Dimmo Landing Site, located in Kyanamukaka Sub-county in Masaka District was selected as the beach accessed by fish factory trucks within Zone 1. The beach has a population of 480 people. The main economic activities at the beach are fishing and trading. Masaka is one of the riparian districts of Lake Victoria grouped in Zone 1 (see map). In total, there are 30 landing sites, 1908 fishermen and 1000 boats in the district. The catch statistics for Nile perch, tilapia and mukene species landed in 2001 and the estimated value are given in Table 2.1 below:

Table 2.1 Estimated Fish Catch for Masaka District by Species and Weight for 2001

Species	**Weight** (kgs)
Nile perch	3,429,365
Tilapia	846,072
Mukene	847,970

Source: Masaka District records

Table 2.2: Rates Charged by Masaka District on Fishery Activities and Fishing Vessels: 2002/2003.

Type of Licence	**Rate** (Shs)
Fishing vessel (Parachute <5 Metres)	20,000
Fishing vessel (Ssesse >5 metres)	30,000
Fishing permits	No charge
Specific licence fees	250,000

Source: Masaka District records

Factory trucks from all the fish factories in Uganda buy fish from the beaches of Dimmo and Lambu. Some of them also go to Namirembe landing site, though it is not gazatted.

The district has spearheaded the plan to improve sanitation and handling facilities at Dimmo. For instance through the LVEMP – Microproject component, an ecosan toilet has been constructed at Dimmo while private investors have been encouraged to manage and develop sanitation and fish handling facilities at Lambu. A number of staff have been trained in quality assurance and deployed at beaches with factory trucks.

According to the district officials, the incomes of fishers in the district have increased as a result of the increase in price of Nile perch which presently stands at Shs 2,100 per kilogram. However, the artisanal processors, traders and local consumers have

been affected in that they cannot compete for Nile perch with the truck traders who offer much higher prices.

2.1.1 Infrastructure and Facilities

Below are the general facilities and infrastructure at Dimmo.

Table 2.3. Infrastructure and Facilities

Infrastructure and Facilities	Number
Retail shops	50
Food kiosks	20
Public latrine	2
Drug shops	4
Primary school	1
Recreational facilities	1 football pitch

Source: FIRRI, survey data September 2002

2.1.2 Findings of the Focus Group Discussion

Focus Group Discussion was conducted at Dimmo with 8 participants. The participants were employed in fishery and non-fishery activities. Two were *mukene* fishers while four fished Nile perch and the remaining two participants were local beach leaders. The discussion lasted about 45 minutes.

There were two main topics of discussion:

a) Narration of the collapse of fish processing and trading at Dimmo

b) Impacts of Nile perch fish export industry on the *mukene* fishery.

Collapse of Fish Processing and Trading

The peak period in the history of fish processing and trading at Dimmo was during the Nile perch boom, between 1985 and 1989. Smoking was the main form of processing and the main species processed were Nile perch and tilapia. The main destination markets for processed fish were Kasese, DRC and Rwanda, however, some smoked fish was also taken to rural markets that were a bit far from Dimmo. There were nearly 180 traders and approximately 100 processors at Dimmo. Many people were also employed in fish processing support services such as fire wood collection and fish gutting.

Following the arrival of factory trucks in 1990, fish processing and trading activities began to decline at the beach because they were denied supplies. Much of the fish was sold to factory trucks. Between 1990 and 1998, the prices of fish were still low (between Shs 1200 – 1500) and some processors and traders could compete with factory agents. Some good supplies would also be obtained whenever factory trucks failed to come to the beach. There was also an abundant supply of fish rejected by factory agents due to poor quality. Another reason that ensured continued supply of fish to the local traders and processors was that they used to pay cash for fish quantities purchased unlike factory agents who used to buy on credit.

In 1999, some fishers began using poison to fish and this was followed by a ban on fish exports by the EU. The ban led to the resumption of fish processing, since there were no factory agents to out-compete the local traders. However, when the ban was lifted and hence the resumption of industrial fish processing in Uganda, there has been a steady rise in the price of a kilogram of Nile perch to the present level of Shs. 2100. At such a high price, the local processors and traders could not compete with factory agents and this led to the collapse of the two sectors. At present, the factory agents no longer obtain their fish supplies on credit. There is also reduction in quantities of fish rejected because most of the fish is landed early enough to avoid spoilage coupled with improved handling facilities such as the use of ice.

The mukene fishery

Mukene fishing at Dimmo began in 1993 with 3 fishers. Presently there are about 15 fishers. Below are the impacts of Nile perch fish export activities on the mukene fishery at Dimmo:

a) The increased demand for Nile perch by factories agents has led to a shift in demand for mukene by local traders who sell it in rural markets for consumption which has also led to an increase in prices. Presently a kilogram of processed mukene goes for Shs. 1000 yet before, it used to cost Shs. 250.

b) Some fishers who were targeting mukene have shifted to Nile perch in order to benefit from the rise in incomes of Nile perch fishers and a number of Nile perch fishers who have made losses have also shifted to the mukene fishery.

c) The mukene fishery has also benefited from the infrastructural developments such as roads maintenance , toilets and borehole construction that have been put up as a result of the Nile perch fish export activities at the beach.

d) Depending on the season, there is usually a shift of labour (crews) and fishing units such as boats and engines between mukene and Nile perch fishery.

2.2 Fish Production Sub-sector

2.2.1 Overview

Dimmo Landing Site has six raised platforms. The main type of fishery is gill netting followed by long lining. There are approximately 35 fishing unit owners at Dimmo. There are 70 Ssese boats and approximately 60 have out board engines. The main fish species landed is Nile perch followed by tilapia and then mukene.

2.2.2 Fishers Characteristics

The sample consisted of 21 fish producers who were entirely male and of the Buganda tribe. Almost all the fish producers were married (90.5%) while the rest were single. About 66.7% of them had gone to primarily school, 28.6% had advanced to secondary level whereas 4.8% did not go to school at all. Table 2.4 presents the average age, years spent fishing and at landing and household size.

Table 2.4: Age, Years Spent Fishing and Years at Landing and Household Size of Producers

	N	Mean	Std. Deviation
Age	21	34.67	8.3387
Years spent fishing	21	9.14	7.0731
Years spent at landing	21	10.00	10.6207
Household size	21	7.57	5.4366

Source FIRRI survey data September 2002.

2.2.3 Fishing Inputs and Costs

Boats and Engines

In the sample, 95.2% of the operators owned boats while 4.8% rented them at a fee of about Shs. 50,400 per month. All of them operated the large-sized Ssesse boats. Table 2.5 presents information on boat characteristics.

Table 2.5: Boat Characteristics

	Ssesse boat	
	Mean	**Std Deviation**
Cost price (Shs)	444,500	106,744.9
Salvage value (Shs)	24,750	42,410.1
Useful life (Years)	4	2.2
Years in operation	2	1.5

Source FIRRI survey data September 2002.

Nearly 76.2% of the respondents had boats that were motorized using mainly 15HP outboard engines whereas the rest (23.8%) were paddled. For the owners of motorized boats, 57.1% owned the outboard engines while 23.8% hired them at an average cost of Shs. 250,000 per month. Table 2.6 provides information on outboard engine characteristics.

Table 2.6: Outboard Engine Characteristics

	Mean	Std Deviation
Cost price (Shs)	3,023,333	560,887.9
Salvage value (Shs)	293,333	477,294.0
Useful life	10	3.7
Years in operation	3	3.6

Source FIRRI survey data September 2002.

Fishing Gear

The majority of the fish producers used gill nets (81%) with only a few using mosquito seines (19%). Table 2.7 presents information on gear characteristics.

Table 2.7: Information on gear Types Used

	Gill nets		Mosquito nets	
	Mean	Std Deviation	Mean	Std Deviation
Number per boat	78	28.1	1	.0
Size	7	.5	.	.
Unit cost price	29,118	12,839.8	450,000	57,735.0
Useful life	2	.9	0	.3
Salvage value	9,118	36,324.7	0	.0

Source FIRRI survey data September 2002.

Capital

Most of the fish producers derived their initial capital from fishing (47.6%), farming (31.8%) and various other sources (14.3%). Owners of motorized gill net fishing units on the average had invested Shs. 5,485,625 in their enterprises roughly doubling that of non-motorized gill net fishing units and about 7 times higher than for mosquito seine fishing units. See Table 2.9.

Labour

Most gill net and longline fishing units employed 3 crewmembers per boat while mosquito seine fishing unit employed 4 crewmembers per boat. The majority (81.2%) of fishing unit owners employed a ‘percentage of gross revenue’ system to remunerate their crewmembers with only a few particularly among motorized gill net fishing units (18.8%) employing a ‘percentage of net revenue’ system. Table 2.8 presents information on average crew number per boat and their share proportions.

Table 2.8: Crewmembers per Boat and their Share Proportions

	Motorized gill netters		Non-motorized gill netters		Mosquito seine netters	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Crewmembers per boat	2.88	.34	3.00	.	4.00	.00
Share proportion (%)	26.25	8.27	30.00	.	35.00	17.32

Source FIRRI survey data September 2002.

Other Costs

There were other costs incurred on a day-to-day basis. These included fuel, boat, gear and engine maintenance costs as presented in Table 2.9.

Table 2.9: Summary of Capital and Monthly Input Costs

	Paddled gill netters- Nile perch	Motorized gill netter- Nile perch	Mosquito nets- Mukene
N= 21	1	16	4
Investment	2,700,000	5,485,625	797,500
Boat hire	0	735	0
Engine hire	0	3,646	0
Labour costs	33,600	73,382	28,965
Fuel	0	185,275	39,343
Bait	0	0	0
Boat maintenance	0	802	583
Gear maintenance	0	0	0
Engine maintenance	0	3,063	0
Other costs	0	1,925	1,750
Operating costs	**33,600**	**268,827**	**70,641**
Depreciation	47,814	42,110	36,250

Total costs	**81,414**	**310,937**	**106,891**
Quantities landed (kg)	53.33	142.46	413.38
Price/ kg	2,100	2,041	340
Gross revenue	112,000	293,881	139,009
Net revenue	**30,586**	**-17,056**	**32,118**

Source FIRRI survey data September 2002.

2.2.4 Earnings of Production Enterprises

The fishers primarily target Nile perch (81%) with only a few catching mukene (19%). Fish catches, prices and revenues of the various types of fisheries production enterprises are summarized in Table 2.10. The negative net revenue for motorized gill netters was attributed to the low season at the time of survey.

Table 2.10: Average Catch, Prices and Revenues by Gear Type

Source FIRRI survey data September 2002.

Most fish producers sold their fish to factory agents (81%), bicycle traders (9.5%) and beach consumers (4.8%). Nearly 14.3% of them reported that the factory agents provided them with money, which they invested in fishing inputs whereas the rest had no special arrangement. About 42.9% of the fish producers did not have alternative sources of income with a few engaging in farming (28.6%), small-scale trading (23.8%) and other activities (4.8%).

2.3 Fish Processing Sub-sector

2.3.1 Overview

There are no publicly owned fish processing facilities at Dimmo. Sun-drying of mukene is the main fish processing method carried out.

2.3.2 Fish Processors Characteristics

It is important to note that artisanal fish processors have diminished with the increase in Nile perch exports. Fishers cannot sell their catch at low prices to local processors when factory processors offer higher prices. As a result, only two fish processors were available for interview at Dimmo Landing Site. Of the two respondents interviewed, 1 was male and the other a female. Both were Baganda by tribe. The male was single and never went to school at all. The female was separated and managed to attain primary education. The respondents had an average age of 45, have lived for 17 years at the landing and have a family size of 3 persons. Fish smoking and sun drying were their activities. Processing facilities included smoking pit, wire-mesh and drying rack, which were either privately owned or communally owned.

2.3.3 Fish Processing Inputs and Costs

Capital

The source of capital for one respondent was fishing while for the other, it was family/relatives. The processors invested little capital (average of Shs.60,000) due to the low technology involved in artisanal processing.

Labour

There are two categories of labour namely hired and own labour. The owner of smoking kiln spends Shs 4,000 on labour while the sundrier does everything by himself.

Other costs

These involve daily expenses incurred in the processing unit. The expenses include hire of drying ground at Shs.5, 600 and fire wood for fish smoking at Shs.4,000 per month.

Table 2.11: Monthly Input Costs for the Different Processing Facilities

	Smoking- Nile perch	**Drying- Mukene**
N= 2	1	1
Investment	60,000	.
Hire of smoking kiln	0	1,307
Firewood	1,000	0
Oil	0	0
Maintenance of smoking kiln	0	0
Labour	933	0
Operating costs	**1,933**	**1,307**
Depreciation	230	0
Total costs	**2,163**	**1,307**
Quantities processed	20.00	30.00
Buying prices/ kg	1,000	600
Selling prices/ kg	1,200	1,000
Cost of raw fish	20,000	18,000
Gross revenue	24,000	30,000
Net revenue	**1,837**	**10,693**

	Smoking		Sundrying	
	Mean	Std Deviation	Mean	Std Deviation
Nile perch				
Capital investment	60,000.00	.	.	.
Fuelwood	4,000.00	.	.	.
Labour	4,000.00	.	.	.
Operating costs	8,000.00	.	.	.
Depreciation	1,000.00	.	.	.
Total cost	9,000.00	.	.	.
Mukene				
Hire of drying ground	.	.	5,600.00	.
Operating costs	.	.	5,600.00	.
Total costs	.	.	5,600.00	.

Source FIRRI survey data September 2002.

2.3.4 Processors' Outputs and Incomes

The main species processed is Mukene, followed by Nile perch in varying quantities. The average monthly quantities processed, buying price, selling price, cost of raw fish, gross revenue and net revenue are presented in the Table 2.12 below.

Table 2.12: Monthly Processing Revenues by Type of Enterprise

Source FIRRI survey data September 2002

The respondents revealed that fish supply was very poor because there are too many local competitors (50%) and that demand by factory agents out competes them (50%). The destinations for the processed fish are the beach and rural markets. The main buyers are the bicycle traders and consumers at the beach. There were no alternative income sources reported for Dimmo processors.

2.4 Fish Marketing Sub-sector

2.4.1 Overview

There is a good access road from Kalisizo, which facilitates fish marketing. There are approximately 8 truck traders and 2 factory agents. The main fish species traded is Nile perch. The main destinations of fresh Nile perch are the factories while tilapia is consumed locally at the beach. Mukene is sold in the neighbouring rural markets.

The average prices of fresh fish per kg for the various fish species landed at Dimmo are given below (Table 2.13).

Table 2.13. Fresh Fish Prices by Species

Fish species	**Prices** (Shs/kg)
Nile perch	2,100
Tilapia	1,000
Mukene	240

Source: FIRRI, survey data September 2002

2.4.2 Fish Traders Characteristics

There were 10 traders interviewed at Dimmo Landing Site, of whom all were males. The traders comprised of 1 bicycles trader and 9 factory agents. The main tribes dominating the trading sector were the Baganda 7, Basoga, Samia and other tribes constituted 10% respectively. Most of the traders 9 were married and only 1 trader was single. In the sample 4 traders out of the 10 had attained secondary and 6 primary education. Initial capital mainly came from fishing (3), loans (3), family members (1) farming (1) and processing factory (2). Two categories of labour were identified namely self - employment (10) and hired labour (9). Labour was calculated on weekly basis depending on the number of days worked.

Table 2.14: Distribution of Fish Traders in the Sample by Means of Transport

	Frequencies	Percentage
Bicycle trader	1	10.0
Factory agent	9	90.0
Total	10	100.0

Source: FIRRI survey data September 2002

2.4.3 Marketing Inputs and Costs

There are two types of traders operating in Dimmo. Bicycle traders with average capital investment of 33.000/= and factory agent with no trading Assets. Both type of traders incur labour cost but the factory agent spends more due to huge quantities dealt in and species involved. The table below shows a cost table associated with fish trading enterprises.

Table 2.15: Mean Input Costs of Fish Trading Units by Type of Trader.

	Bicycle trader		**Factory agent**	
	Mean	Std Deviation	Mean	Std Deviation
Nile perch				
Labour	.	.	102,026	93,105
Operating costs	.	.	102,026	93,105
Total costs	.	.	102,026	93,105
Clarias				
Capital investment	33,000	.	.	.
Labour	3,040	.	.	.
Operating costs	3,040	.	.	.
Depreciation	1,083	.	.	.
Total costs	4,123	.	.	.

Source: survey data September 2002

2.4.4 Marketing Outputs and Incomes

The bicycle trader interviewed dealt in *Clarias* whereas factory agents traded Nile perch. Table 2.16 below presents the quantities of fish traded, buying price, selling price, cost of raw fish and gross revenues.

Table 2.16: Average Cost of Raw Fish and Revenues of Fish Traders by Species and Type of Trader

	Bicycle trader		Factory agent	
	Mean	Std Deviation	Mean	Std Deviation
Nile Perch				
Quantities traded (kg/month)	.	.	1,162	1,057
Buying price (Shs. /kg)	.	.	1,911	196
Selling price (Shs./kg)	.	.	2,122	44
Cost of raw fish (Shs./month)	.	.	2,325,556	2,239,472
Gross revenue (Shs./month)	.	.	2,505,111	2,339,390
Net revenue (Shs./month)	.	.	77,529	184,896
Clarias				
Quantities traded (kg/month)	196	.	.	.
Buying price (Shs. /kg)	700	.	.	.
Selling price (Shs/kg)	850	.	.	.
Cost of raw fish (Shs/month)	137,200	.	.	.
Gross revenue (Shs/month)	166,600	.	.	.
Net revenue (Shs/month)	25,300	.	.	.

Source: FIRRI, survey data September 2002

The majority of Dimmo traders reported that the supply of fish was poor (6) 60%, fair (3) 30%and good (1) 10%. The poor supply was attributed enforcement of regulations (4) that was exercised during the study, low catches (2) due to Bad season and other related problems. The main destinations for the fish was urban markets (1) and factories (9).

2.5 Fish Consumption

2.5.1 Consumers' characteristics

A total of 43 fish consumers were interviewed at Dimmo Landing Site. The largest tribe was of the Baganda (76.2%), followed by the Banyankole (9.3%). Other tribes included the Basoga, Samia and others. Most (86.0%) of the respondents were males and a few (14.0%) women were also interviewed. Most of the respondents (76.7%) were married, (18.6%) single, (4.7%) separated. The respondents had an average age of 32 years, family size of 4 persons and had lived at the landing for 7 years. The majority 58.1% had attained primary education, 32.6% secondary, 2.3% Tertiary while 7.0% had not been to school at all. Among the respondents interviewed, 67.4% bought their fish for household consumption while the others got from the boat. In the absence of fish, the substitutes available to the consumers were meat (44.2%) beans (39.5%) and others.

2.5.2 Consumption levels and trends.

The artisanal fisherfolk mainly consumed tilapia (58.1%) and Nile perch (34.9%) with only a few (4.7%) eating Mukene. Nearly 60.5% of the respondents reported that there had been a decline in fish consumption levels over the past one year.

The average daily quantity of fish consumed by households was 1.7 kgs and this ranged between 0.2 and 6.0 kgs. Household and per capita quantities consumed varied between sub-sectors and fish species as provided in Table 2.18. Most respondents (87%) reported a change over the years in the quantities consumed by their household members with 76.7% saying that they had decreased, 20.9% saying that the quantities had increased and 2.3% could not tell.

The average number of times fish was consumed was 3.4 times a week and this ranged between 1 to 7 times with variations between sub-sectors and common species consumed as given in Table 2.18. Most respondents (62.8%) reported a change in frequency of fish consumption over the past year with 90.2% of these saying it had decreased. A few (2.4%), however, said it had increased. A majority of respondents (62.8%) also reported a change in the sizes of fish they ate with their families over the past year and 46.3% said that the sizes had decreased and 4.9% said the sizes had increased.

A majority of respondents (44.2%) mentioned meat as the main substitute to fish followed by beans (39.5%), groundnuts (2.3) and others (9.3%).

Most respondents (74.4%) reported a change in prices of fish for consumption over the past year and 69.8% of these reported an increase. The consumer prices of fish species varied among the different sub-sectors as indicated in Table 2.18.

Generally the per capita consumption per month was reported highest in producer households (5.4 kg/month) and least in local processor households (1.60kg/month). Per capita consumption of Nile perch was higher than that of tilapia as indicated in Table 2.18.

Table 2.17: Consumption Data by Category of Consumers

	Non-fishery consumers		Local traders		Local processors		Fish producers	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Household size	4.56	4.95	5.6	1.90	3.0	2.83	5.0	.00
Household consumption (kg/day)	1.79	1.98	1.6	.61	.9	.92	1.9	.92
Per capita consumption (kg/day)	.36	.18	.3	.14	.3	.07	.4	.18
No. of times per week	3.00	1.66	3.7	1.70	1.5	.71	3.8	1.97
Per capita consumption (kg/month)	3.93	2.35	4.5	3.71	1.6	1.13	5.4	4.01
Nile perch								
Per capita consumption (kg/month)	4.90	2.74	4.0	2.26	.8	.	5.0	4.99
Price/ kg	1,272	322.44	2,100	.00	900	.	.	.
Cost of fish (Shs/month)	4,332	2,732.26	8,400	4,751.76	720	.	.	.
Nile tilapia								
Per capita consumption (kg/month)	3.20	2.28	3.3	1.50	2.0	.	3.9	1.62
Price/ kg	960	364.69	1,085	285.36	1,500	.	927	245.32
Cost of fish (Shs/month)	2,720	1,420.21	3,842	2,952.88	3,000	.	3,327	1,297.76
Mukene								
Per capita consumption (kg/month)	.	.	.	.	.	.	4.8	5.09
Price/ kg	.	.	.	.	.	.	.	.
Cost of fish (Shs/month)	.	.	.	.	.	.	.	.
Other species								
Per capita consumption	.	.	4.5	.	.	.	.	.

(kg/month)								
Price/ kg	.	.	.	.	.	.	.	.
Cost of fish (Shs/month)	.	.	.	.	.	.	.	.

Source: FIRRI, survey data September 2002

2.6 Community Perceptions towards Chilled Facilities

At Dimmo, local fish processors and consumers did not see any positive impacts of factory trucks. Out of the 21 fish producers, 14 reported higher incomes as the main positive impact, followed by ready market (4). Out of the 10 traders, 5 reported higher prices while 3 reported increased employment.

The main negative impact associated with chilled transport facilities by producers was under-weighing practices of buyers. Traders, however, reported high fish prices as the main problem. Fish consumers, on the other hand, complained of high fish prices, resulting in reduced fish consumption.

Some respondents had no suggestions to address the negative impacts. However, some consumers and traders recommended that capacities of factories be limited.

3. SAANYA LANDING SITE

3.1 Background

Saanya Landing Site, located in Kamengo Sub-county in Mpigi District was selected as the beach not accessed by fish factory trucks although may be accessed by factory/boat agents within zone 1. The beach has a population of 84 people. The main economic activities at the beach are fishing, livestock keeping, crop farming and trading. Mpigi is one of the riparian districts of Lake Victoria grouped in Zone 1 (see map). In total, there are 2,133 fishermen and 1,232 boats in the district. The catch statistics for fish species of Nile perch and tilapia landed in 2001 and their estimated value are given in Table 3.1 below:

Table 3.1: Estimated Fish Catch for Mpigi District by Species, Weight and Value for 2001

Species	**Weight** (kgs)	**Value** (Shs)
Nile perch	707,887	1,021,031,200
Tilapia	82,264	196,894,100

Source: Mpigi District records

The district generates public revenues from the fisheries annually, through licensing fees, tender of landing sites and graduated tax paid by fishers. The rates below are charged for the various fishery activities and vessels.

Table 3.2: Rates Charged by Mpigi District on Fishery Activities and Fishing Vessels: 2002/3

Type of Licence	**Rate** (Shs)
Fishing vessel (Parachute <5 metres)	20,000
Fishing vessel (Ssesse >5 metres)	30,000
Fishing permits	10,000
Specific licence fees	250,000

Source: Mpigi District records

Trucks from fish processing plants began operating in Mpigi District in the early 1990s. There are four regular trucks from the fish factories of Uganda Fish Packers Ltd., Ngege Limited, Byansi fish factory and Uganda Marine Products Limited that operate in the district. The trucks operate only at Ggolo Landing Site in the whole district.

The district has reported a number of positive impacts associated with factory. Generally, the incomes of fishers in the district are said to have increased as a result of the increase in price of a kilogram of Nile perch, which is Shs 2,100. There are

also increased employment opportunities for many youths who used to be idle before the arrival of chilled transport facilities. A good number of them are now employed as crews, bait suppliers and casual fish labourers. There is also relatively improved sanitation and fish handling at beaches where these trucks are found. The district has benefited from the revenues that are promptly paid by the tenderers of beach markets and also from the specific licences that are paid by the factory trucks.

The artisanal processors, traders and local consumers, however, are affected in that they cannot compete for Nile perch with the truck traders who offer much higher prices.

3.1.1 Infrastructure and Facilities

Below are the general facilities and infrastructure at Saanya.

Table 3.3. Infrastructure and Facilities at Saanya

Infrastructure and Facilities	Number
Retail shops	3
Food kiosks	2
Borehole	1
Public latrine	1

Source: FIRRI, survey data September 2002

3.2 Fish Production Sub-sector

3.2.1 Overview

Saanya Landing Site lacks any facility in support of fish production. The main type of fishery is gill netting with approximately 30 fishers. Some fishers also use long lines. There are approximately 30 fishing unit owners at Saanya. There are 30 parachute boats and none of the fishing boats has an out board engine. There are 3 transport boats with outboard motor engines of horsepower 15. The main fish species landed is tilapia followed by *Protopterus* and then Nile perch.

3.2.2 Fishers' Characteristics

The sample in the production study at Saanya consisted of 15 respondents, of whom all were male and their mean age was 32 years. The majority were of the Ganda tribe (67%) and a number of other smaller tribes (33%). The majority (73%) were married with an average family size of 4 members. Most fishers (60%) had attained primary education, 13% had attained secondary level education while 27% had not gone to school at all. The mean number of years respondents had spent fishing was 10 while the average number of years the respondents had lived at Saanya Beach was 9.

3.2.3 Fishing Inputs and Costs

Boats and engines

Some 93% of the fishers own boats while only one fisher was renting a “parachute” boat at Shs. 15,000 per month. Most fishers (87%) own “parachute” boats while only one fisher owned the Ssese type. Information on the boats used is given in the Table 3.4 below.

Table 3.4: Information on the Boats Owned

	Parachute boat		**Ssesse boat**	
	Mean	Std Deviation	Mean	Std Deviation
Cost price (Shs)	27,462	6,923	15,000	.
Salvage value (Shs)	0	.0	0	.
Useful life (Years)	2	1.1	1	.
Years in operation	1	.8	0	.

Source: FIRRI, survey data September 2002

None of the respondents used an outboard engine to fish.

Fishing gear

The main types of gear used as reported by respondents are shown in Table 3.5 below.

Table 3.5: Main Gear Types Used

	Long lines		**Gill nets**	
	Mean	Std Deviation	Mean	Std Deviation
Number per boat	100	.	5	3.3
Size	9	.	5	.3
Unit cost price	100	.	6,786	2,242.2
Useful life		.	1	0
Salvage value	0	.	0	.0

Source: FIRRI, survey data September 2002

The main source of initial capital for production enterprises is fishing, as indicated in Table 3.6 below:

Table 3.6: Sources of Initial Capital

	Long lines	Gillnets	Total
Fishing	1	8	9
Farming	--	5	5
Other	--	1	1
Total	1	14	15

Source: FIRRI, survey data September 2002

Labour costs

The data on average number of crew members per boat, modes of payment and number of days fished per week are provided in Table 3.7 below:

Table 3.7: Payments to Production Labour

	Long lines	Gillnets
Average number of crew	1	1
Respondents employing % of revenue payment system	1	14
Mean number of days worked per week	4	4

Source: FIRRI, survey data September 2002

Other costs

Other operational costs were identified in fish production and the information is summarized in Table 3.8. Boat and gear maintenance, particularly among gillnet fishers, were the main ones.

Based on the production data presented above, the monthly operating costs are computed as given by Table 3.8 below:

Table 3.8: Summary of Monthly Production Costs

	Paddled gill netters- Nile perch	**Paddled gill netter- Tilapia**
N= 14	6	8
Investment	43,125	70,000
Boat hire	622	0
Engine hire	0	0
Labour costs	9,592	9,966
Fuel	0	0
Bait	0	0
Boat maintenance	194	0
Gear maintenance	0	0
Engine maintenance	0	0
Other costs	0	0
Operating costs	**10,409**	**9,966**
Depreciation	645	1,488
Total costs	**11,054**	**11,454**
Quantities landed (kg)	31.69	36.95
Price/ kg	858	625
Gross revenue	27,231	23,255
Net revenue	**16,177**	**11,801**

	Long liners - Nile Tilapia
Capital investment	35,000
Boat maintenance	--
Labour cost	27,000
Monthly operating costs	27,000

Monthly depreciation	10,417
Monthly total costs	37,417

Source: FIRRI, survey data September 2002

3.2.4 Earnings of the Production Enterprises

The fishers primarily target tilapia and Nile perch. Fish prices, monthly catches and revenues for the various enterprises and species are summarized in Table 3.9. Net revenues are derived by deducting monthly costs from gross revenues.

Table 3.9: Average Catches and Incomes of Fishers by Species.

	Long liners - Protopterus
Catch (kg/month)	180.0
Price (Shs/kg	300
Gross revenue (Shs/month)	54,000
Net revenue (Shs/month)	16,583

Source: FIRRI, survey data September 2002

All the fishers sell their catch to bicycle traders and only at that beach. All respondents had no arrangements with their buyers such as credit in forms of money or fishing inputs. Most respondents (53%) mentioned farming as their alternative source of income, followed by livestock keeping. Some respondents (40%) had no alternative sources of income.

3.3 Fish Processing Sub-sector

3.3.1 Overview

There are no publicly owned fish processing facilities at Saanya. There is no fish processing at Saanya.

3.4 Fish Marketing

3.4.1 Overview

Fish marketing at Saanya is facilitated by the presence of a good access road that is linked to the main Masaka-Kampala road. Kamengo is the nearest trading centre.

There are approximately 30 bicycle traders, 5 motorcycle traders and 3 boat traders who buy fish from the islands of Buganga. The main fish species traded is tilapia. The main destinations of fresh tilapia are Kamengo and Kampala City.

The average prices of fresh fish per kg for the various fish species landed at Saanya are given below (Table 3.10).

Table 3.10. Fresh Fish Prices by Species

Fish species	**Prices** (Shs/kg)
Nile perch	1,500
Tilapia	1,000

Source: FIRRI, survey data September 2002

3.4.2 Fish Traders' Characteristics

Sixteen traders were interviewed in the sample, all were males with an average age of 33. Most had primary education (56.3%) while others had Secondary schooling (43.8%). Most of them were of the Baganda tribe (75%). Fish traders were classified on the basis of the means of transport they used to transport their fish, and their distribution is given in Table 3.11

Table 3.11: Distribution of Fish Traders in the Sample by Means of Transport

	Frequency	**Percentage**
Bicycle trader	11	69
Motor cycle	4	25
Boat trader	1	6
Total	16	100.0

Source: FIRRI, survey data September 2002

3.4.3 Marketing Inputs and Costs

Assets of individual fish traders consisted of bicycles, motor cycles, fish baskets and boats. The fish traders reported wide variations in the capital investment with motorcycle traders investing an average of Shs 934,500, followed by boat traders with an average of Shs. 500,000. Although the bicycle traders had more labour cost, in total the boat traders had more operational costs. The costs associated with the fish trading enterprises by species of fish traded in are presented in Table 3.12

Table 3.12: Mean Input Costs of Fish Trading Units by Type of Trader and Species

	Bicycle trader		**Motorcycle trader**		**Boat trader**	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation

Nile tilapia						
Capital investment	42,060	23,262	934,500	512,709	500,000	.
Fuel	.	.	97,920	42,400.	.	.
Hire of pick-up	.	.		.	168,000	.
Labour	53,229	99,368	40,533	25,984	23,200	.
Operating costs	53,229	99,368	113,973.	34,315	191,200	.
Depreciation	933	807	583	.	13,888	.
Total cost	54,163	99,067	114,118	34,290	205,088	.

Source: FIRRI, survey data September 2002

3.4.4 Marketing Outputs and Incomes

All the fish traders interviewed were dealing in is Nile Tilapia. The table below presents the quantities of fish traded, buying price, selling price, cost of raw fish and gross revenues.

Table 3.13: Average Revenues of Fish Traders by Species and by Type of Trader

	Bicycle trader		**Motorcycle trader**		**Boat trader**	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Nile Tilapia						
Quantities traded (kg/month)	620	1,132	2,232	1,849	800	.
Buying price (Shs/kg)	1,036	401	875	250	80	.
Selling price (Shs/kg)	1,364	463	2,500	2,337	1,000	.
Cost of raw fish (Shs./month)	620,909	1,134,996	1,932,000	1,908,728	64,000	.
Gross revenue (Shs/month)	776,364	1,351,605	5,631,000	6,226,658	800,000	.
Net revenue (Shs/month)	101,291	121,394	3,584,881	6,342,461	530,911	.

Source: FIRRI, survey data September 2002

3.5 Fish Consumption

3.5.1 Consumers' characteristics

In total there were 41 heads of households interviewed about levels and trends of fish consumption and prices at Saanya. 10 where not employed in any fishery-related activity, 15 were fish producers and another 16 were fish traders. The average age of the respondents was 32 years and 85% were male while 15% were females. They were predominantly of the Baganda tribe (63%), followed by Banyankole (12%) and other tribes (25%). Most respondents (83%) were married and had attained primary level education (57%) followed by those who had not attained any formal education (23%). The households had resided at Saanya for an average of 8 years and had an average number of 6 family members, although this varied according to the different sub-sectors.

3.5.2 Consumption levels and trends

Most households (97%) commonly consumed tilapia. The average quantity of fish consumed by households was 1.7 kgs per day and this ranged between 0.5 and 4 kgs. Household and per capita quantities (day/month) consumed varied between sub-sectors and fish species as provided in Table 3.14. Most respondents (88%) reported a change over the years in the quantities consumed by their household members with 95% saying that they had decreased and only 5% saying that the quantities had increased.

The average number of times fish was consumed was 3.4 times a week and this ranged between 1 to 7 times with variations between sub-sectors and common species consumed as given in Table 3.14. Most respondents (93%) reported a change in frequency of fish consumption over the past year with 97% saying it had reduced. A few (3%), however, said it had increased. A majority of respondents (68%) also reported a change in the sizes of fish they ate with their families over the past year and 69% said that the sizes had decreased while 31% said the sizes had increased.

Most respondents (71%) among consumers not involved in fish production usually bought the fish they ate with their families. A few (29%) did not buy fish for home consumption.

Most respondents (93%) reported a change in prices of fish for consumption over the past year and 93% of these reported an increase. The consumer prices of fish species varied among the different sub-sectors as indicated in Table 3.14.

A majority of respondents (65%) mentioned beans as the main substitute to fish followed by vegetables (13%), meat (12%) and other substitutes (10%).

Table 3.14: Household/per Capita Quantities, Frequency and Prices of Fish Species for Consumption by Sub-Sector at Saanya

	Non-fishery consumers		**Local traders**		**Fish producers**	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Household size	5.5	3.4	5.5	2.0	5.0	.0
Household	1.7	.9	1.7	.9	1.8	.9

consumption (kg/day)						
Per capita consumption (kg/day)	.4	.3	.3	.2	.4	.2
No. of times per week	2.4	.8	3.8	1.1	3.9	1.6
Per capita consumption (kg/month)	3.9	3.2	5.0	3.7	5.4	3.0
Nile perch						
Per capita consumption (kg/month)	.	.	.	.	11.2	.
Price/ kg	.	.	.	.	.	.
Cost of fish (kg/month)	.	.	.	.	.	.
Nile Tilapia						
Per capita consumption (kg/month)	2.4	.8	3.8	1.1	3.6	1.3
Price/ kg	933	514	1,025	375	850	212
Cost of fish (kg/month)	1,933	968	3,812	1,717	2,900	141

Source: FIRRI survey data, September 2002.

3.6 Community Perceptions towards Chilled Facilities

Unlike Dimmo, Saanya does not have direct influence of chilled transport facilities but has boat traders who buy from the lake and other traders who buy and transport to areas were these facilities exist. As a result, out of the 14 fish producers interviewed, 10 reported high prices and 2, ready market. Local traders and consumers have not witnessed the positive impacts.

Negative impacts reported by producers included price setting by factory agents 1 and buying fish on the lake 1. Of the 16 fish traders, 6 reported high prices of fish, 6 reported reduced fish supplies, 1 reported buying fish on the lake and 1 buying of tilapia as well as the negative impacts.

Out of the 10 consumers interviewed, 8 complained of high prices of fish while 2 reported reduced fish consumption.

The main solutions to the negative impacts of chilled transport facilities was given by traders, namely to limit capacities of factories and to curb buying of fish on the lake. Consumers and producers had no suggestions to address the negative impacts of chilled transport facilities.

ZONE 2

4. KASENYI LANDING SITE

4.1 Background

Kasenyi Landing Site, located in Katabi Sub-county in Wakiso District was selected as the beach accessed by fish factory trucks. The beach has a population of 900 people. The main economic activities at the beach are fishing and trading. Wakiso is one of the riparian districts of Lake Victoria grouped in Zone 2 (see map). The catch statistics for main fish species landed in 2001 and the estimated values are given in Table 4.1 below:

Table 4.1: Estimated Fish Catch for Wakiso District by Species, Weight and Value for 2001

Species	**Weight** (kgs)	**Value** (Shs)
Nile perch	2,593,417	2,818,120,145
Tilapia	1,952,005	1,667,669,780
Protopterus	32,279	29,810,270
Clarias	1029	803,200

Source: Wakiso District records

Table 4.2: Rates Charged by Wakiso District on the Fishery Activities and Fishing Vessels: 2002/3

Type of licence	**Rate** (Shs)
Fishing vessel (Parachute <5 Metres)	20,000
Fishing vessel (Ssesse >5 metres)	30,000
Fishing permits	Not Charged
Specific licence fees	250,000

Source: Wakiso District records

Trucks from fish processing plants began operating in Wakiso District in the early 1990s. Factory trucks are found at the beaches of Kasenyi, Kigungu, and Greenfields. Some trucks also operate, though illegally, at the beaches of Gerenge and Busabala. Trucks from Uganda Fish Packers Ltd., Greenfields Ltd, Gomba fish factory, Marine and Agro, Ngege Limited, Byansi fish factory and Uganda Marine Products Limited operate in the district.

The district has tried to restrict the operations of factory trucks at only the gazatted beaches of Greenfields, Kasenyi and Kigungu. The district reported a number of positive impacts associated with chilled facilities. The incomes of fishers in the district are said to have increased as a result of the increase in price of a kilogram of Nile perch, which is Shs 2,300. There has been development of infrastructure such as roads, weighing shades and toilets at the gazetted beaches. There is also improvement in revenue collections at the beach markets. However, artisanal processors, traders and local consumers are affected in that they cannot compete for Nile perch with the truck traders who offer much higher prices.

4.1.1 Infrastructure and Facilities

Below are the general facilities and infrastructure at Kasenyi.

Table 4.3. Infrastructure and Facilities at Kasenyi

Type of Infrastructure and Facilities	Number
Retail shops	150
Food kiosks	2
Bars	50
Latrines	2
Toilet	16
Drug shops	3
Police Post	1
Borehole	None
Recreational facilities	Several

Source: FIRRI, survey data September 2002

4.2 Fish Production Sub-sector

4.2.1 Overview

Kasenyi Landing Site has the following facilities in support of fish production:

a) Two boat making yards

b) Seven fish handling platforms, privately owned by the fish processing plants operating at Kasenyi

c) Four wooden stalls for handling of other species of fish than the Nile perch

The main type of fishery is gill netting with approximately 30 fishers. Some fishers also use long lines. In all, there are approximately 36 fishing unit owners at Kasenyi.

There are 65 fishing boats of the Ssesse type and approximately 52 fishing boats have out board engines. There are 15 transport boats with outboard motor engines of horsepower 15.

60 boats are involved in gill netting and 5 are involved in long lining. The main fish species landed is Nile perch followed by tilapia.

4.2.2 Fishers Characteristics

The sample consisted of 21 fish producers, of whom 85.7% were males. Nearly all the producers belonged to the Buganda tribe (90.5%) and were married (90.5%). About 62% of the fish producers had gone to primarily school, 28.6% had advanced to secondary level whereas 9.5% did not go to school at all. Table 4.4 presents the average age, years spent fishing and at landing and household size.

Table 4.4: Average Age, Years Spent Fishing, at Landing and Household Size.

	N	Mean	Std. Deviation
Age	21	35	7.2
Years fishing	21	8.4	4.6
Years at landing	21	9.0	10.2
Household size	21	6.8	4.4

Source: FIRRI, survey data September 2002

4.2.3 Fishing Inputs and Costs

Boats and Engines

In the sample, 95.2% of the fish producers owned boats while 4.8% rented them at an average fee of Shs. 22,400 per month. All the fish producers operated the large-sized Ssesse boats. Table 4.5 presents information on boat characteristics.

Table 4.5: Boat Characteristics at Kasenyi

	Ssesse boat	
	Mean	Std Deviation
Cost price (Shs)	505,000	204,154.2
Salvage value (Shs)	48,750	68,936.9
Useful life (Years)	5	2.7
Years in operation	3	2.4

Source: FIRRI, survey data September 2002

Nearly 76.2% of the boats were motorized using 8 -15HP outboard engines whereas the rest (23.8%) were paddled. For the owners of motorized boats, 69.3% owned the

outboard engines while 31.9% hired them at an average cost of Shs. 90,000 per month. Table 4.6 provides information on outboard engine characteristics.

Table 4.6: Outboard Engine Characteristics at Kasenyi

	Mean	Std Deviation
Cost price (Shs)	2,007,143	832,479.4
Salvage value (Shs)	169,231	425,018.9
Useful life (Years)	10	6.2
Years in operation	4	2.3

Source: FIRRI, survey data September 2002

Fishing Gear

The majority of the fish producers used gill nets (90.5%) with only a few using long lines (4.8%) and mosquito seines (4.8%). Table 4.7 presents information on gear characteristics.

Table 4.7: Characteristics of Gears Used at Kasenyi

	Long lines		Gill nets		Mosquito seines	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Number per boat	300	.	145	258.3	1	.
Size	9	.	7	1.4	.	.
Unit cost price (Shs)	100	.	37,237	53,073	400,000	.
Useful life (Years)		.	2	.8		.
Salvage value (Shs)	0	.	0	.0	0	.

Source: FIRRI, survey data September 2002

Capital

Most of the fish producers derived their initial capital from fishing (52.4%), farming (14.3%), credit (9.5%) and various other sources (23.8%). Owners of motorized gill net fishing units on the average had invested Shs. 5,798,000 in their enterprises roughly doubling that of non-motorized gill net and mosquito seine fishing units and about 25 times higher than for longline fishing units. See Table 4.9.

Labour

Most gill net and longline fishing units employed 2 crewmembers per boat while Mosquito seine fishing unit employed 4 crewmembers per boat. The majority of non-motorized fishing unit owners (100%) employed a '% of gross revenue' system to remunerate their crewmembers whereas owners of motorized (73.3%) and mosquito seine (100%) fishing units primarily employed a '% of net revenue' system. Table 4.8 presents information on average crew number per boat and their share proportions.

Other Costs

These were the costs incurred on a day-to-day basis. These included fuel, bait and boat-gear-engine maintenance presented in Table 4.9.

Table 4.8: Crewmembers per Boat and their Share Proportions

	Motorized gill netters		**Non-motorized gill netters**		**Long liners**	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Crew per boat	2.20	.41	2.00	.00	1.00	
Crew Share (%)	28.00	6.76	37.50	9.57	30.00	

Source: FIRRI, survey data September 2002

Table 4.9: Summary of Capital and Monthly Input Costs

	Paddled longlines-Nile perch	**Paddled gill netters-Nile perch**	**Motorized gill netter-Nile perch**	**Paddled gill netter-Tilapia**	**Mosquito nets-Mukene**
N= 21	1	3	15	1	1
Investment	230,000	3,306,667	5,798,000	75,000	2,770,000
Boat hire	0	0	0	5,227	0
Engine hire	0	0	2,800	0	0
Labour costs	28,500	39,817	57,252	12,250	10,928
Fuel	0	0	104,457	0	110,160
Bait	250	0	0	0	0
Boat maintenance	0	2,683	1,556	0	0
Gear maintenance	0	0	467	0	0
Engine maintenance	0	0	4,356	0	0
Other costs	0	0	1,307	0	1,633
Operating costs	**28,750**	**42,500**	**172,194**	**17,477**	**122,722**
Depreciation	2,391	31,226	55,893	2,869	28,625
Total costs	**31,141**	**73,726**	**228,086**	**20,346**	**151,346**
Quantities landed (kg)	47.50	62.08	135.17	35.00	1215.00
Price/ kg	2,000	2,000	2,047	700	110
Gross revenue	95,000	124,167	277,713	24,500	133,650
Net revenue	**63,859**	**50,441**	**49,627**	**4,154**	**-17,696**

Source: FIRRI, survey data September 2002

4.2.4 Earnings of Production Enterprises

The fishers primarily target Nile perch (90.5%) with only a few catching Nile Tilapia (4.8%) and mukene (4.8%). Fish catches, prices and revenues of the various types of fisheries production enterprises are summarized in Table 4.10.

Table 4.10: Average Catch, Prices and Revenues by Gear Type

Source: FIRRI, survey data September 2002

Most fish producers sold their fish to factory agents (95.3%) operating at the beach and largely reported (90.5%) that they had no special arrangement with the fish buyers such as provision of fishing inputs or credit. Nearly 72% of the fish producers did not have alternative sources of income with a few engaging in small-scale trading (14.3%) and farming (14.3%).

4.3 Fish Processors Sub-Sector

4.3.1 Overview

There are no publicly owned fish processing facilities at Kasenyi. Deep-frying is the most common processing method at Kasenyi.

A sample of 7 processors interviewed at Kasenyi landing either smoke or deep fry fish. There are no publicly owned processing facilities since very simple technologies are employed. There are only 2 fish smokers at the landing following increased prices of Nile perch fish and regulation enforcement that eliminates the capture of immature fish. The processors used to process a lot of immature fish because they could not compete with factory processors in terms of prices. The remaining 5 processors, deep- fry using simple pans/basins. These mostly buy rejects from fish factories. Table 4.11 shows average age, household size and number of years spent at the landing.

Table 4.11: Average Age, Household Size and Number of Years Spent at Kasenyi

	Number	Minimum	Maximum	Mean
Age	7	27	45	37
Household size	7	1	10	6
Years spent at landing	7	1	15	5

Source: FIRRI, survey data September 2002

Females dominate the artisanal processing sector. All the processors interviewed were the Baganda (7). 28.6% were married, 57.1% separated and 14.3% widowed. Almost 71.4% of the respondents had attained primary education while 28.6% had no schooling at all. The widely used method of processing is deep-frying using frying pan 71.4% and only 28.6% smoke using smoking kiln (low technology oven). All the processing equipment is privately owned.

4.3.2 Fish Processing Inputs and Costs

Capital

Fish processors have very low capital investments because of the simple technologies employed in the artisanal processing. The majority 28.6% obtained capital from their relatives, from farming or other sources while 14.2% got from fishing. Fish smokers own on average 1 smoking kiln with average expected useful life of 7 years. The average cost of a kiln is Shs.100, 000. For those who deep-fry fish in hot oil, they own on average 1 frying pan costing Shs.3,500 and expected useful lifespan of 4 months, with no salvage value.

Labour

The results indicate that there are 3 categories of labour: 42.9% of the respondents are self-employed, 28.6% employ family labour and 14.3% hire labour. Where self and family labour is employed, the information on the cost was derived from what the processor would have paid if he had hired labour to operate the unit in his absence. The average number of labourers per processing unit is 1 for self and 2 for hired or family labour units. Owners of smoking kiln spend on average Shs.30, 000 compared to the deep-frying processors who spend Shs 8,000 on average per month on labour. This indicates that smoking is relatively more labour intensive.

Other costs

Generally, traditional processors incur costs on a daily basis to transform fresh fish into dried products. At Kasenyi, they use firewood, which costs Shs 34,000 and Shs 28,500 for smoking and deep-frying respectively. Deep-frying requires additional expense of cooking oil of Shs.72,000 per month, as given in Table xx.

Table 4.12: Monthly Input Costs by Type of Processing

	Smoking- Nile perch	**Frying- Nile perch**
N= 7	5	2
Investment	100,000	3,500
Hire of smoking kiln	0	0
Firewood	8,500	5,700
Oil	0	10,920
Maintenance of smoking kiln	2,333	0
Labour	7,000	373
Operating costs	**17,833**	**16,993**
Depreciation	105	97

Total costs	**17,939**	**17,090**
Quantities processed	15.00	29.00
Buying prices/ kg	850	900
Selling prices/ kg	1,100	1,420
Cost of raw fish	13,500	26,800
Gross revenue	17,000	43,300
Net revenue	**-14,439**	**-590**

Source: FIRRI, survey data September 2002

4.3.3 Processors' Outputs and Incomes

Kasenyi processors only process Nile Perch rejected by factory trucks. Because of its low quality, the prices compared to the high quality fish required by factory trucks, is relatively low. The average quantities of fish processed, buying and selling prices, cost of raw fish and gross revenue is presented on Table 4.13.

Table 4.13: Cost of Raw Fish and Revenues from Processed Fish by Processing Methods

Source: FIRRI, survey data September 2002

The processors mainly deal in Nile perch species. Most smokers (100%) and deep-fryers (80%) reported that the supply of fish was poor due to the high demand by factory processors. Smoked fish is sold to wholesale traders who later take it to urban markets while fried fish is sold to consumers at the beach. The processors involved in smoking reported that farming 50% was their main alternative source of income while the majority 60% involved in deep-frying fish reported no other alternative. Only 20% of them kept livestock and practiced subsistence farming respectively.

4.4 Fish Marketing

4.4.1 Overview

Fish marketing at Kasenyi is facilitated by the presence of a good murrum road that is regularly maintained. It is linked to the Entebbe-Kampala road. Abaita-Ababiri is the nearest trading centre.

There are approximately 5 bicycle traders, 20 traders who hire 4 pick-ups and seven truck traders. The main fish species traded in are Nile perch and tilapia. The main destinations of fresh tilapia are Kampala City while much of the Nile perch is taken to factories. All the fish that is processed (fried) is locally consumed at the beach.

The average prices of fresh fish per kg for the various fish species landed at Kasenyi are given below (Table 4.14).

Table 4.14. Fresh Fish Prices by Species

Fish species	**Prices** (Shs/kg)
Nile perch	2200
Tilapia	1,000

Source: FIRRI, survey data September 2002

4.4.2 Fish Traders' Characteristics.

Kasenyi landing site used to have many fish traders but only 19 were available during this particular study. Of the respondents interviewed, 17 were male while 2 were females. These traders use different facilities like bicycles; pick ups, trucks, motorcycles and so on. The main tribes dominating the trading sector were the Baganda (14); Baruli (2). Other tribes include Basoga and itesots.

Most of the traders (18) are married and only (1) trader is single. In the sample 12 traders out of the 19 have attained secondary education, 6 primary education, with only 1 not have attained any education. Initial capital mainly came from family members (9) followed by farming (4) fishing (3). Other sources of capital included loans and other means. Two categories of labour were identified namely own - labour (10) and hired labour (9). Labour was calculated on weekly basis depending on the number of days worked.

Table 4.15: Distribution of Fish Traders in the Sample by means of Transport

	Frequencies	**Percentage**
Bicycle trader	1	5.3
Beach side retailer	1	5.3
Factory agent	6	31.6
Pick up trader	11	57.9
Total	19	100.0

Source: FIRRI, survey data September 2002

4.4.3 Marketing Inputs and Costs

Fish traders who operate in Kasenyi consists of bicycle traders with average capital investment of Shs 80,000; beachside retailers, factory agents and pick up traders without assets but hire premises/vehicles and there fore incur other expenses like labour and transport cost. A factory agent who hires a pick up to supply a factory spends on average Shs 112,000. The table below presents the costs associated with the fish trading enterprise.

Table 4.16: Mean Input Costs of Fish Trading Units by Type of Trader.

	Bicycle trader		**Beach side trader**		**Factory agent**		**Pick-up trader**	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Nile perch								
Capital Investment	80,000	.	.	.	.	.	.	.
Hire of truck	.	.	.	.	112,000	.	.	.
Labour	210,824	.	21,024	.	114,520	98,409.54	.	.
Operating costs	210,824	.	21,024	.	133,186	95,673.45	.	.
Depreciation	833	.	.	.	.	.	.	.
Total costs	211,657	.	21,024	.	133,186	95,673.45	.	.
Nile tilapia								
Hire of pick-up	.	.	.	.	.	.	159,520	122,275
Labour	.	.	.	.	.	.	26,885	24,628
Operating costs	.	.	.	.	.	.	171,904	141,991
Total cost	.	.	.	.	.	.	171,904	141,991

Source: FIRRI, survey data September 2002

4.4.4 Marketing Outputs and Incomes

The main species of fish traded on is Nile perch and Nile Tilapia. The bicycle traders, beachside retailers and factory agents are the main dealers in Nile perch while pick up traders essentially buy Nile tilapia. Bicycle trader's deal in small quantities of rejects and as a result ends in losses. The table below presents the quantities of fish traded, buying price, selling price, Cost of raw fish and gross revenues.

Table 4.17: Average Cost of Raw Fish and Revenues of Fish Trader by Species and by Type of Trader.

	Bicycle trader		**Beach side trader**		**Factory agent**		**Pick-up trader**	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation

Nile Perch								
Quantities traded (kg/month)	1,520	.	320	.	3,933	2,976	.	.
Buying price (Shs. /kg)	1,800	.	800	.	2,042	66	.	.
Selling price (Shs./kg)	1,900	.	900	.	2,155	97	.	.
Cost of raw fish (Shs./month)	2,736,000	.	256,000	.	7,973,333	5,896,367	.	.
Gross revenue (Shs./month)	2,888,000	.	288,000	.	8,520,667	6,606,998	.	.
Net renue (Shs./month)	-59,657	.	10,976	.	414,147	732,505	.	.
Nile Tilapia								
Quantities traded (kg/month)	.	.	.	.	.	.	602	415
Buying price (Shs. /kg)	.	.	.	.	.	.	945	476
Selling price (Shs./kg)	.	.	.	.	.	.	1,182	540
Cost of raw fish (Shs./month)	.	.	.	.	.	.	648,000	625,421
Gross revenue (Shs/month)	.	.	.	.	.	.	792,364	758,909
Net revenue (Shs/month)	.	.	.	.	.	.	-27,540	168150

Source: FIRRI, survey data September 2002

The poor fish supply was attributed to high demand by factory agents (9) 47.4%; followed by low catches (4) 21.1%; bad season (3) 15.8% and other factors.

The main fish traded on are Nile perch (8) 42.1% and Tilapia 11 (57.9%). The destinations for these fish species are urban markets (63.2%)12, factory trucks 6 (31.6%) with only 1 trader taking to rural markets.

4.5 Fish Consumption

4.5.1 Consumer's characteristics

A total of 52 fish consumers were interviewed at Kasenyi landing site. Most of them were of the Baganda tribe (86.5%). Other tribes included, Basoga and the Banyankole. Most (78.8%) of the respondents were males and a few (21.2%) women. Most (75.0%) of the respondents were married, (13.5%) single, (9.6%)

separated and (1.9%) widowed. The majority (55.8%) had attained primary education, (30.8%) secondary, (1.9%) University education and (11.5%) had not been to school at all. Among the respondents interviewed, 67.3% bought their fish for household consumption while the others did not.

4.5.2. Consumption levels and trends.

In the sample 88.5% of the respondents reported that there had been a decline in fish consumption levels over the past one year.

The artisanal fisherfolk mainly consumed tilapia (59.6%) and Nile perch (34.6%)

The average quantity of fish consumed by households was 1.8 kgs per day and this ranged between 0.2 and 5 kgs. Household and per capita quantities consumed varied between sub-sectors and fish species as provided in Table 4.18. Most respondents (87%) reported a change over the years in the quantities consumed by their household members with 53.8% saying that they had decreased, 3.8% saying that the quantities had increased and 42.3 had no comment.

The average number of times fish was consumed was 1-.4 times a week. Most respondents (80.8%) reported a change in frequency of fish consumption over the past year with 78.8% saying it had decreased. A few (2.4%), however, said it had increased. A majority of respondents (80.8%) also reported a change in the sizes of fish they ate with their families over the past year and 55.83% said that the sizes had decreased while 25.0% said they had increased.

A majority of respondents (34.6%) mentioned beans as the main substitute to fish followed by meat (28.8%), groundnuts (5.8%) and others (17.3%).

Most respondents (86.5%) reported a change in prices of fish for consumption over the past year and 84.6% of these reported an increase. The consumer prices of fish species varied among the different sub-sectors as indicated in Table 4.18.

In Kasenyi, local traders reported the highest household per capita consumption of 6.kg/month followed non fishery consumers (5.8kg/month), fish producers (4.6kg/month) while local processors reported the least (1.6kg/momth). However, among those who mainly ate Nile perch, local fish traders again had the highest monthly per capita consumption of 6.3 kg/month and processors reported the least (1.61 kg/month). For Nile tilapia consumers, local processors reported the highest per capita consumption (3.67kg /month) while local traders reported the least (2.8 kg/month). Consumers not involved in fishery activities consumed (3.0kg/month).

Table 4.18: Consumption Data by Category of Consumers

	Non-fishery consumers		**Local traders**		**Local processors**		**Fish producers**	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Household size	4.3	3.1	5.0	.0	6.3	2.8	5.0	.0
Household consumption (kg/day)	.9	.8	2.0	1.3	2.1	1.8	1.8	1.1

Per capita consumption (kg/day)	.3	.2	.4	.3	.3	.2	.4	.2
No. of times per week	5.7	7.7	3.5	1.6	3.0	2.0	3.1	1.6
Per capita consumption (kg/month)	5.1	5.6	6.1	5.4	3.7	3.6	4.6	3.8
Nile perch								
Per capita consumption (kg/month)	5.9	6.5	6.3	4.2	1.6	.5	6.0	3.9
Price/ kg	1,675	788	1,666	577	900	173	.	.
Cost of fish (Shs/month)	9,116	8,895	10,133	6,466	1,325	598	.	.
Nile tilapia								
Per capita consumption (kg/month)	3.0	.0	2.9	.9	3.7	2.9	3.0	1.5
Price/ kg	1,500	.	1,063	456	1,166	763	1,166	360
Cost of fish (Shs/month)	4,500	.	3,109	2,032	3,166	1,040	3,122	2,009
Other species								
Per capita consumption (kg/month)	.	.	12.8	13.6	.	.	.	.
Price/ kg	.	.	1,500	.	.	.	.	.
Cost of fish (Shs/month)	.	.	4,800	.	.	.	.	.

Source: FIRRI, survey data September 2002

4.6 Community Perceptions towards Chilled Facilities

In the sample of 21 producers interviewed, 14 (66.7%), associated the coming of chilled transport facilities with positive impacts of high prices; 5 (19.0%) with ready market and only (2) respondents did not notice the positive impacts.

Out of the 19 traders interviewed, 12 did not associate any positive impacts with chilled facilities. However, of the remaining 7, who were all middlemen between fishers and chilled facility operators, 4 (21.1%) revealed that the positive impacts were high prices; 2 (10.5%) ready market and 1 said it was increased employment.

Artisanal processors, traders and consumers also reported negative impacts of chilled transport facilities. Four out of the seven traditional processors interviewed reported high prices of fish while (3) said that there were reduced fish supplies. Artisanal traders (7) revealed that prices of fish are high; (2) said there was reduced

fish supplies and that chilled transport facility operators also bought tilapia, which could be for the local processors. Some traders also reported that there were price fluctuations (1) and under weighing (1) of fish using faulty scales. Five consumers reported that chilled transport facilities resulted in high prices of fish.

Because the producers did not have any negative impacts, solutions were given only by those affected. Local processors suggested that concerned authorities should set fish size limits for factories. Local traders suggested that Tilapia should not be exported (7) while others suggested that factory capacities be limited (3). Out of 6 consumers in Kasenyi, (2) suggested that fish size limits be set for factories.

5. BUWANZI LANDING SITE

5.1 Background

Buwanzi Landing Site, located in Busamizi Sub-county on the Buvuma Isalnds in Mukono District, was selected as the beach not accessed by fish factory trucks although may be accessed by factory/boat agents. The beach has a population of 723 people. The main economic activities at the beach are fishing and livestock keeping. Mukono is one of the riparian districts of Lake Victoria grouped in Zone 2 (see map). In total, there are 240 landing sites, 11,450 fishermen and 4,865 boats in the district. The catch statistics for fish landed in the year 2000 are given in Table 5.1 below:

Table 5.1: Estimated Fish Catch for Mukono District by Species and Weight

Species	**Weight** (kg)
Nile perch	43,346,782
Tilapia	41,327,205
Clarias	5,196
Bagrus	65,038
Mormyrus	547
Other	25,049
Total	84,769,817

Source: Mukono District records

Table 5.2: Rates Charged by Mukono District on Fishery Activities and Fishing Vessels: 2002/3

Type of licence	**Rate** (Shs)
Fishing vessel (Parachute <5 Metres)	20,000
Fishing vessel (Ssesse >5 metres)	30,000
Fishing permits	10,000
Specific licence fees	250,000

Source: Mukono District records

Trucks from fish processing plants began operating in Mukono District in the early 1991, coming from Kenya. Presently, trucks come from the fish factories of Hwan Sung, Uganda Fish Packers Ltd., Ngege Limited, Byansi fish factory and Uganda

Marine Products Limited. They operate at the landing sites of Katosi, Kiyindi and Senyi.

The district has put in place infrastructure in support of the fish export industry at beaches. For instance, fencing off of areas designated for export industry and construction of weighing shades and toilets/latrines to improve fish handling and sanitation respectively. Two fisheries inspectors have been deployed at each of the gazetted landing sites. There are plans to secure a loan from the African Development Bank (ADB) to fund electrification programme for the gazetted beaches.

The incomes of fishers in the district are said to have increased as a result of the increase in price of a kilogram of Nile perch. There is increased use of the right mesh-seized gear as a result of the demand for big sized Nile perch by factory agents. There is increased use of ice for fish preservation. The district has benefited from the revenues that are promptly paid by the tenderers of beach markets and also benefits from the specific licences that are paid by the factory trucks. On the negative side, artisanal fish processing, trading and local consumption have been affected in that they cannot compete for Nile perch with the truck traders who offer much higher prices. There is also a threat of over exploitation.

There are plans by the District Fisheries Department to develop fish farming to cater for the local demand for fish.

5.1.1 Infrastructure and Facilities

Below are the general facilities and infrastructure at Buwanzi.

Table 5.3: Infrastructure and Facilities at Buwanzi

Infrastructure and facilities	**Number**
Retail shops	3
Food kiosks	4
Borehole	1
Public latrine	1
Primary School	1

Source: FIRRI, survey data September 2002

5.2 Fish Production Sub-sector

5.2.1 Overview

There is a boat-making yard at Buwanzi Landing Site. The main type of fishery is gill netting with approximately 15 fishers. 10 fishers use long lines and 3 have beach seines.

There are approximately 25 fishing unit owners at the beach. There are 22 parachute boats and 3 Ssese boats. None of the fishing boats has outboard engine.

The main fish species landed is tilapia followed by Nile perch.

5.2.2 Fishers' Characteristics

The sample in the production study at Buwanzi consisted of 11 respondents, of whom all were male and their mean age was 31 years. The majority were of the Busoga tribe (36%), followed by Baganda (9%), Banyoro (9%), Adhola (9%) and a number of other smaller tribes (36%). The majority (73%) were married with an average family size of 4 members. A majority of fishers (46%) had attained primary education, 27% had attained secondary level education while 27% had not gone to school at all. The mean number of years respondents had spent fishing was 7 while number of years they had lived at Buwanzi Beach was 5.

5.2.3 Fishing Inputs and Costs

Boats and engines

Some 82% of the fishers own boats while 18% of them rent boats at an average cost of Shs 24,000 per month. Information on the boats used is given in Table 5.4 below.

Table 5.4: Information on the Boats Owned

	Parachute boat		**Ssesse boat**	
	Mean	Std Deviation	Mean	Std Deviation
Cost price (Shs)	93,125	29,873.2	180,000	.
Salvage value (Shs)	5,625	11,160.4	0	.
Useful life (Years)	5	2.6	6	.
Years in operation	1	1.7	0	.

Source: FIRRI, survey data September 2002

None of the respondent used an outboard engine to fish.

Fishing gear

The main types of gear used as reported by respondents are shown in Table 5.5 below.

Table 5.5 Main Gear-Types Used

Gear types	**Count**	**Percentage**
Long lines	5	45
Gillnets	6	55

Source: FIRRI, survey data September 2002

Table 5.6: Information on Gear Types Used

	Long lines		Gill nets	
	Mean	Std Deviation	Mean	Std Deviation
Number per boat	196	143.5	11	5.6
Size	7	.7	5	.4
Unit cost price	91	12.4	6,333	1,472.0
Useful life	0	.1	1	.3
Salvage value	0	.0	0	.0

Source: FIRRI, survey data September 2002

The main source of initial capital for production enterprises is fishing, as indicated in Table 5.7 below:

Table 5.7: Source of Initial Capital (Count)

Enterprise	Source of Initial Capital			Total
	Fishing	Farming	Other	
Long lines	2	2	1	5
Gillnets	3	3		6
Total	5	5	1	11

Source: FIRRI, survey data September 2002

Labour costs

The data on average number of crewmembers per boat, modes of payment and number of days fished per week are provided in Table 5.8 below:

Table 5.8: Payments to Production Labour

	Long lines	Gill nets
Average number of crew	2	2
Respondents employing % of revenue payment system	5	6
Mean number of days worked per week	5	4

Source: FIRRI, survey data September 2002

Other costs

Other operational costs included boat and gear maintenance, particularly among gillnet fishers, were the main ones. Based on the production data presented above, the monthly operating costs are computed as given by Table 5.9 below:

Table 5.9: Summary of Monthly Production Costs

	Paddled longlines- Nile perch	Paddled gill netter- Tilapia
N= 11	5	6
Investment	127,450	137,083
Boat hire	0	1,867
Engine hire	0	0
Labour costs	124,600	24,120
Fuel	0	0
Bait	27,600	0
Boat maintenance	1,073	1,167
Gear maintenance	0	1,167
Engine maintenance	0	0
Other costs	0	0
Operating costs	153,273	28,320
Depreciation	2,007	2,089
Total costs	155,281	30,410

Quantities landed (kg)	161.40	63.14
Price/ kg	1,380	717
Gross revenue	237,400	44,664
Net revenue	82,119	14,254

Source: FIRRI, survey data September 2002

5.2.4 Earnings of the Production Enterprises

The fishers primarily target tilapia and Nile perch. Fish prices, monthly catches and revenues for the various enterprises and species are summarized in Table 5.10. Net revenues are derived by deducting monthly costs from gross revenues.

Table 5.10: Average Catches and Incomes of Fishers by Species.

Source: FIRRI, survey data September 2002

All the fishers sell their catch to bicycle traders and only at the beach. All respondents had no arrangements with their buyers such as credit in terms of money and fishing inputs. Most respondents (54%) did not have an alternative source of income. A few (36%) mentioned farming as their alternative source of income.

5.3 Fish Processing Sub-sector

5.3.1 Overview

There are no publicly owned fish processing facilities at Buwanzi. There is no fish processing at Buwanzi.

5.4 Fish Marketing Sub-sector

5.4.1 Overview

Buwanzi is an Island beach that is only accessed by water. There are two boat traders who ferry fish to Masese and Bwondha .

The average prices of fresh fish per kg for the various fish species landed at Buwanzi are given below (Table 5.11).

Table 5.11. Fresh Fish Prices by Species

Fish species	**Prices** (Shs/kg)
Nile perch	1,800
Tilapia	1,000

Source: FIRRI, survey data September 2002

5.4.2 Fish Traders' Characteristics

Two boat traders were interviewed at Buwanzi. Both were male and single with an average age of 22 and had traded in fish for an average of 2 years. One had primary-level education while the other had attained tertiary- level education. Both belonged to the Basoga tribe.

5.4.3 Inputs and Costs

None of the fish traders at Buwanzi possessed any assets. Both traders hired the boats they used for transporting their fish. One dealt in Nile perch while the other dealt in Nile tilapia.

Generally, the one who dealt in Nile tilapia had more operating costs than the one who dealt in Nile perch. The costs incurred by both traders are presented in Table 5.12.

Table 5.12: Mean Input Costs of Fish Trading Units by Type of Trader and Species Traded.

	Boat trader	
	Mean	Std Deviation
Nile perch		
Hire of boat	12,000	.
Labour	30,000	.
Operating costs	42,000	.
Total costs	42,000	.
Nile tilapia		
Hire of boat	240,000	.
Labour	48,000	.
Operating costs	288,000	.
Total cost	288,000	.

Source: FIRRI, survey data September 2002

5.4.4 Marketing Outputs and Incomes

The main species of fish traded in are Nile perch and Nile Tilapia. The table below presents the quantities of fish traded, buying price, selling price, cost of raw fish, gross and net revenues.

Table 5.13: Average Cost of Raw Fish and Revenues of Fish Traders by Species and by Type of Trader

	Boat trader	
	Mean	Std Deviation
Nile Perch Quantities traded (kg/month)	480	.
Buying price (Shs. /kg)	1,500	.
Selling price (Shs./kg)	1,700	.
Cost of raw fish (Shs./month)	720,000	.
Gross revenue (Shs./month)	816,000	.
Net revenue (Shs./month)	54,000	.
Nile Tilapia Quantities traded (kg/month)	1,200	.
Buying price (Shs. /kg)	500	.
Selling price (Shs./kg)	800	.
Cost of raw fish (Shs./month)	600,000	.
Gross revenue (Shs./month)	960,000	.
Net revenue (Shs./month)	72,000	.

Source: FIRRI, survey data September 2002.

5.5 Fish Consumption

5.5.1 Consumers' Characteristics

A total of 31 heads of households were interviewed about fish consumption/price levels and trends at Buwanzi (Buvuma Islands). They included 11 fish producers, 2 traders and 18 heads of households not involved in any fishery-related activity. Their average age was 30 years and 68% were male while 32% were females. Respondents of the Basoga tribe were predominant (39%), followed by Baganda (13%) and various other tribes (48%). Most respondents (71%) were married and had attained primary level education (48%) followed by those who had attained secondary level education (26%) and those who had not attained any formal education (29%). Their households had an average number of 4 family members and had lived at Buwanzi for an average of 4 years.

5.5.2 Consumption Levels and Trends

Most households (93%) commonly consumed tilapia and 7% consumed Nile perch (see Table 5.14). The average quantity consumed by households was 1.2 kgs per day and this ranged between 0.2 and 3 kgs. The quantities consumed by households varied between sub-sectors. Table 5.14 provides the information on average quantities consumed by common species and sub-sector of consumers. Most respondents (67%) reported a change over the years in the quantities of fish eaten with 97% saying that the quantities consumed by their families had decreased while only 3% said that the quantities had increased.

The average number of times fish was consumed was 3.9 times a week and this ranged between 1 to 7 times with variations between sub-sectors and common species consumed as given in Table 5.14. Most respondents (61%) reported a change in frequency of fish consumption over the past year with all saying it had reduced. A majority of respondents (71%) also reported a change in the sizes of fish they ate with their families over the past year and 68% said that the sizes had decreased while 32% said the sizes had increased.

Most respondents (64%) usually bought the fish they ate with their families. A few (36%) did not buy fish for home consumption, this was common among those involved in fish production. Most respondents (61%) reported a change in prices of fish for consumption over the past year and 90% reported an increase. The prices of fish by species varied among the different sub-sectors as indicated in Table 5.14.

A majority of respondents at Buwanzi (39%) mentioned beans as the main substitute to fish followed by vegetables (36%), meat (15%) and other substitutes (10%).

Table 5.14: Consumption Data by Category of Consumers

	Non-fishery consumers		Local traders		Fish producers	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Household size	4.2	3.0	1.0	.0	5.0	.0
Household consumption (kg/day)	1.1	.5	.4	.2	1.4	.7
Per capita consumption (kg/day)	.3	.2	.4	.2	.3	.2
No. of times per wk	4.2	2.2	3.0	.0	3.8	1.8
Per capita consumption (Shs/month)	6.1	6.5	4.5	2.1	4.2	2.5
Nile perch						
Per capita consumption (kg/month)	1.0	.	6.0	.	.	.
Price/ kg	800	.	500	.	.	.
Cost of fish (Shs/month)	800	.	3,000	.	.	.
Nile tilapia						
Per capita consumption (kg/month)	4.2	2.2	3.0	.	3.8	1.8
Price/ kg	625	154	500	.	560	89
Cost of fish (Shs/month)	2,175	1,249	1,500	.	1,840	971

Source: FIRRI, survey data September 2002

5.6 Community Perceptions towards Chilled Facilities

Almost all the fish producers (11) anticipated that if chilled transport facilities began to operate at their landing, they would fetch higher fish prices (36.4%) and have a ready market (54.1%). Additionally, all the fish producers (12) did not associate any negative impacts with chilled transport facilities. However, local traders and processors reported that operation of chilled transport facilities would result in reduced fish supplies (10) while the non-fishery consumers (8) particularly associated them with high fish prices.

ZONE 3

6. BWONDHA LANDING SITE

6.1 Background

Bwondha Landing Site, located in Malongo Sub-county in Mayuge District was selected as the beach accessed by fish factory trucks. The beach has a population of 4,704 people. The main economic activities at the beach are fishing, livestock keeping, crop farming and trading. Mayuge is one of the riparian districts of Lake Victoria grouped in Zone 3 (see map). In total, there are 63 landing sites, 5,744 fishers and 2,428 boats in the district. The catch statistics for fresh fish species landed in 2001 and the estimated values are given in Table 6.1 below:

Table 6.1: Estimated Fish Catch for Mayuge District by Species, Weight and Value for 2001

Species	**Weight** (kgs)	**Value** (Shs)
Tilapia	2,037,393	1,499,567,488
Nile perch	1,911,750	2,212,088,836
Protopterus	63,325	26,519,183
R. argentea	165,969	47,104,949
Clarias	6,604	2,888,995

Source: Mayuge District records

Table 6.2: Rates Charged by Mayuge District on Fishery Activities and Fishing Vessels: 2002/3

Type of Licence	**Rate** (Shs)
Fishing vessel (Parachute <5 Metres)	20,000
Fishing vessel (Ssesse >5 metres)	30,000
Fishing permits	10,000
Specific licence fees	250,000

Source: Mayuge District records

Trucks from fish processing plants began operating in the then Iganga District in the early 1990s. There are three regular trucks from Masese Fish Packers Ltd. and Gomba fish factory. In the whole district, trucks operate at only Bwondha Landing site.

The district has reported a number of positive impacts associated with fish factories. Generally, the incomes of fishers in the district are said to have increased as a result of the increase in price of a kilogram of Nile perch which is Shs 2,100. There is also relatively improved sanitation and fish handling at beaches where these trucks are found. The artisanal processors, traders and local consumers, however, are affected in that they cannot compete for Nile perch with the truck traders who offer much higher prices

6.1.1 Infrastructure and Facilities

Below are the general facilities and infrastructure at Bwondha.

Table 6.3: Infrastructure and Facilities at Bwondha

Infrastructure and Facilities	Number
Retail shops	30
Health centre	1
Drug shop	5
Food kiosks	10
Borehole	1
Public latrine	1
Police post	1
Recreational facility	1

Source: FIRRI, survey data September 2002

6.2 Fish Production Sub-sector

6.2.1 Overview

Bwondha Landing Site has a boat making yard and three raised platforms. The main type of fishery is trolling with approximately 50 fishers, followed by gill netting (40 fishers) and then cast netting (15 fishers). Some fishers also use long lines.

There are approximately 90 fishing unit owners at Bwondha. There are 100 parachute boats and 50 Ssesse boats. There are 2 fishing boats with outboard engines.

The main fish species landed is tilapia followed by Nile perch and then mukene.

6.2.2 Fishers' Characteristics

The sample consisted of 39 fish producers, of whom 84.6% were males. Bwondha is characterized by a relatively wide ethnic diversity consisting of the Basoga (46.2%), Baganda (11.9%), Samia (5.1%), Adhola (5.1%), and various other tribes (23.1%). About 80% of the fish producers had gone to primarily school, 5.1% had advanced to

secondary level whereas 12.8% did not go to school at all. Table 6.4 presents the average age, years spent fishing and at landing and household size.

Table 6.4: Average Age, Years Spent Fishing and at Landing and Household Size.

	N	Mean	Std. Deviation
Age	39	29.6	6.8
Years spent fishing	39	7.6	4.6
Years spent at landing	39	6.8	4.9
Household size	39	5.8	4.2

Source: FIRRI, survey data September 2002

6.2.3 Fishing Inputs and Costs

Boat and engines

In the sample, 53.8% of the fish producers owned boats while 46.2% rented them at a fee of about Shs. 15,900 per month. Nearly 62% of the fish producers fished using parachute boats while 38.5% operated Ssesse boats. Table 6.5 presents information on boat characteristics.

Table 6.5: Boat Characteristics

	Parachute boat		Ssesse boat	
	Mean	Std Deviation	Mean	Std Deviation
Cost price (Shs)	100,417	45,350.1	264,444	95,539.4
Salvage value (Shs)	0	.0	2,222	6,666.7
Useful life (Years)	4	2.4	5	2.0
Years in operation	1	1.1	2	2.5

Source: FIRRI, survey data September 2002

All the boats except for one Ssese boat were paddled. Table 6.6 provides information on outboard engine characteristics.

Table 6.6: Outboard Engine Characteristics

	Mean	Std Deviation
Cost price (Shs)	700,000	.
Salvage value (Shs)	0	.
Useful life (Years)	10	.
Years in operation	0	.

Source: FIRRI, survey data September 2002

Fishing Gear

A wide range of fishing gears are used by the respondents interviewed at Bwondha with gill nets (48.7%) dominating and long lines following very closely (43.6%). Other fishing gears of lesser importance were trolls (5.1%) and mosquito seines (2.6%). Table 6.7 presents information on gear characteristics.

Table 6.7: Gear Characteristics at Bwondha

	Trolling		Long lines		Gill nets		Mosquito nets	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Number per boat	5.0	1.4	171	173.2	17	25.1	1	.
Size	8.5	.7	7	1.7	5	.4	.	.
Unit cost price	75.0	35.4	93	68.1	9,289	5,566.1	450,000	.
Useful life	.	.	0	.	1	.4	1	.
Salvage value	.0	.0	0	.0	0	.0	300,000	.

Source: FIRRI, survey data September 2002

Capital

Most of the fish producers derived their initial capital from fishing (51.3%), farming (25.6%), credit (7.7%) and various other sources (15.4%). Owners of motorized gill net fishing units on the average had invested Shs. 1,950,000 in their enterprises or about 3 times higher than for mosquito seine fishing units. Other fishing units on the average invested in the range of Shs. 89,000-225,400 per fishing unit (see Table 6.8).

Labour

Most gill net, logline and trolling fishing units employed 2 crewmembers per boat while mosquito seine fishing units employed 4 crewmembers per boat. The majority of the fish producers (94.9%) employed a '% of gross revenue system' with only 5.1% paying their crew a '% of net revenue'.

Other Costs

These included costs that are incurred on a more or less day-to-day basis. These included fuel, bait and boat-gear-engine maintenance presented in Table 6.9.

Table 6.8: Crewmembers per boat and their share proportions

	Motorized gill netters		Non-motorized gill netters		Trollers		Long liners		Mosquito nets	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Crewmembers per boat	2.0	.	1.9	.7	1.5	.7	1.9	.6	4.0	.
Share proportion (%)	30	.	46	16	50	--	44	10	60	.

Source: FIRRI, survey data September 2002

Table 6.9: Summary of Capital and Monthly Input Costs

	Paddled longlines-Nile perch	**Paddled trollers-Nile perch**	**Paddled gill netters-Nile perch**	**Motorized gill netter-Nile perch**	**Paddled gill netter-Tilapia**	**Mosquito nets-Mukene**
N= 39	17	2	5	1	13	1
Investment	88,974	225,400	222,000	1,950,000	134,615	650,000
Boat hire	2,306	0	2,800	0	1,041	0
Engine hire	0	0	0	0	0	0
Labour costs	43,899	71,250	31,106	59,850	19,384	39,600
Fuel	0	0	0	50,400	0	0
Bait	21,294	3,000	0	0	0	0
Boat maintenance	206	583	0	0	1,221	2,333
Gear maintenance	137	0	0	0	808	1,167
Engine maintenance	0	0	0	0	0	0
Other costs	0	0	0	0	0	0
Operating costs	**67,842**	**74,833**	**33,906**	**110,250**	**22,454**	**43,100**
Depreciation	1,711	865	7,172	11,141	2,922	4,144
Total costs	**69,554**	**75,699**	**41,078**	**121,391**	**25,376**	**47,244**
Quantities landed (kg)	56.33	79.17	37.75	105.00	61.10	165.00
Price/ kg	1,712	1,800	1,820	1,900	673	400
Gross revenue	99,271	142,500	68,810	199,500	42,394	66,000
Net revenue	**29,718**	**66,801**	**27,732**	**78,109**	**17,018**	**18,756**

Source: FIRRI, survey data September 2002

6.2.4 Earnings of Production Enterprises

The fishers primarily target Nile perch (66.7%) and Nile Tilapia (30.8%) with only a few catching Mukene (2.6%). Fish catches, prices and revenues of the various types of fisheries production enterprises are summarized in Table 6.10.

Most fish producers sold their fish to factory agents (76.9%) and truck traders (20.5%). The former mainly buy the Nile perch whereas the latter specialize in Nile Tilapia. The fish producers widely reported that there was no special arrangement (94.9%) between them and the buyers in terms of providing them with money, fishing inputs etc. Nearly 63% of the fish producers did not have alternative sources of income with a few engaging in small-scale trading (12.8%) and farming (12.8%).

Table 6.10: Average Catch, Prices and Revenues by Gear Type

	Motorized gill netters	Non-motorized gill netters	Trollers	Long liners	Mosquito nets
	Nile perch	**Nile perch**	**Nile perch**	**Nile perch**	
Catch (kg/ month)	420.0	151.0	316	225.3	.
Price/ kg	1,900	1,825	1,800	1,706	.
Gross revenue (Shs/ month)	798,000	254,050	570,000	418,527	.
Net revenue (Shs/ month)					.
		Nile tilapia			
Catch (kg/ month)	.	244.4	.	.	.
Price/ kg	.	673	.	.	.
Gross revenue (Shs/ month)	.	169,577	.	.	.
Net revenue (Shs/ month)	.		.	.	.
					Mukene
Catch (kg/ month)	.	.	.	.	660.0
Price/ kg	.	.	.	.	400
Gross revenue (Shs/ month)	.	.	.	.	264,000
Net revenue (Shs/ month)	.	.	.	.	

Source: FIRRI, survey data September 2002

6.3 Fish Processing Sub-Sector

6.3.1 Overview

There are no publicly owned fish processing facilities at Bwondha. Smoking is the main fish processing method, followed by sun-drying.

6.3.2 Characteristics of fish processors.

Fish processing activities at Bwodha, is dominated by women (100%). These operate on small capital and therefore, small quantities. The largest tribes involved in the processing are the Basoga 50%, Baganda and Bagungu 10% respectively. The average age of Bwondha fish processors is 31 year with a family size of 8 members and have lived at the landing for 7 years on average.

Most (90%) of the processors are married and only 10% single. The results indicate that very few (20%) have attained secondary education while 40% have either had primary education or no schooling at all. The major processing method is smoking (100%) using smoking kiln (90%) or smoking pit (10%). The processing facility are either privately owned or hired (50%).

Capital

Fish processors at the landing operate with average capital of Shs.20, 600. The main source of capital is farming (60%), family capital and loans 10% and lastly other sources that include sale of assets (20%).

Labour

There are two types of labour. Own-labour constitutes 80% while hired labour 20%. On average therefore a processor incurs labour cost of Shs.13, 000 per month and fire wood cost of Shs.5, 640 per month (Table 6.11).

Table 6.11: Monthly Input Costs for Processing Facilities

	Smoking- Nile perch	**Smoking- Tilapia**
N= 10	9	1
Investment	24,000	7,000
Hire of smoking kiln	373	0
Firewood	1,344	2,000
Oil	0	0
Maintenance of smoking kiln	0	0
Labour	2,826	1,867
Operating costs	**4,544**	**3,867**
Depreciation	68	67

Total costs	**4,612**	**3,934**
Quantities processed	13.44	100.00
Buying prices/ kg	556	600
Selling prices/ kg	817	750
Cost of raw fish	7,167	60,000
Gross revenue	10,778	75,000
Net revenue	**-1,001**	**11,066**

Source FIRRI survey data September 2002.

6.3.3 Processors' Outputs and Incomes

The major species processed are Nile perch (90%) and Tilapia (10%). The quantities of fish processed are very small partly due to the competition by refrigerated trucks that offer high prices for same sizes of fish.

Table 6.12: Cost of Raw Fish and Revenues from Processed Fish by Species

Source FIRRI survey data September 2002.

The fishers reported that fish supply was poor indicted by low catches 50%. Poor supply was attributed to demand by factory agents (30%) and other reasons (20%) beyond their knowledge. The main buyers for processed fish are bicycle traders (80%), wholesale traders (10%) and boat traders (10%). The main destinations for processed fish are at the beach 10%, rural markets 80% and urban markets10%. The majority (70%) of fish processors have no alternative source of income, (20%) are involved in non-fishery related trading and (10%) other businesses.

6.4 Fish Marketing Sub-sector

6.4.1 Overview

Fish marketing at Bwondha is facilitated by the presence of a good access road from Mayuge Town Council. There are 3 bicycle traders, 3 factory agents and 12 pick-up traders and boat traders at Bwondha. The main destination of fresh tilapia is Busia while fresh Nile perch is taken to fish factories in Jinja. The average prices of fresh fish per kg for the various fish species landed at Bwondha are given below (Table 6.13).

Table 6.13 Fresh Fish Prices by Species

Fish species	**Prices** (Shs/kg)

Nile perch	1,800
Tilapia	1,000

Source: FIRRI, survey data September 2002

6.4.2 Fish Traders' Characteristics.

There were 10 traders at Bwondha landing site at the time of the interview. Of the 10 traders 5 were females and 5 were men. The main tribes were the Basoga (7) 70% and the remaining 3 came from the Baganda (1), Bakenye (1) and others (1). Pick up dealers mainly hired space in the vehicle. Most of the traders (8) 80% were married, (1) 10% divorced and (1) 10% separated. In the sample only 2 traders out of the 10 had attained secondary education, 6 primary education and 1 had not attained any education. The results indicate that initial capital mainly came from farming (8) family members (1) and loans (1). Two categories of labour were identified namely self - employment (8) and hired labour (2). Labour was calculated on weekly basis depending on the number of days worked.

Table 6.14: Distribution of Fish traders in the Sample by means of Transport

	Frequencies	**Percentage**
Bicycle trader	1	10.0
Beach side retailer	4	40.0
Pick up trader	5	50.0
Total	10	100.0

6.4.3 Marketing Inputs and Costs

There are three types of traders operating in Bwondha namely Bicycle traders, Beach side retailers and pick up traders, Bicycle traders employ on average 39,500/= and a basket 1500/= for traders involved in tilapia fish as capital investment while beach side retailers and pick up traders have no assets but incur monthly expenses like hire space in pick up (transport costs). Both type of traders incur labour cost at varying degrees. Pick up traders spend more due to huge quantities dealt with and species involved. The table below shows a cost table associated with fish trading enterprises.

Table 6.15: Mean Input Costs of Fish Trading Units by Type of Trader.

	Bicycle trader		**Beach side trader**		**Pick-up trader**	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation

	Bicycle trader		Beach side trader		Pick-up trader	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Nile perch						
Capital Investment	39,500	.	.	.	.	.
Hire of pick-up	.	.	.	.	20,000	.
Labour	35,040	.	.	.	3,248	.
Operating costs	35,040	.	.	.	23,248	.
Depreciation	525	.	.	.	.	.
Total costs	35,565	.	.	.	23,248	.
Nile tilapia						
Capital investment	.	.	.	.	1,500	.
Fuel	.	.	.	.	1,440,000	.
Hire of pick-up	.	.	.	.	646,666	481,802
Labour	.	.	4,445	2,759	41,600	32,119
Operating costs	.	.	4,445	2,759	1,168,266	1,338,660
Depreciation	.	.	.	.	416	.
Total cost	.	.	4,445	2,759	1,168,405	1,338,551
Mukene						
Hire of pick-up	.	.	.	.	80,000	.
Labour	.	.	.	.	20,000	.
Operating cost	.	.	.	.	100,000	.
Total costs	.	.	.	.	100,000	.

Source: survey data September 2002

6.4.4 Marketing Outputs and Incomes

The main species of fish traded on is Nile perch and Nile Tilapia. The bicycle traders and pick up traders are the main dealers in Nile perch while beachside retailers essentially buy Nile tilapia. The table below presents the quantities of fish traded, buying price, selling price, Cost of raw fish and gross revenues.

Table 6.16: Average Cost of Raw Fish and Revenues of Fish Traders by Species and by Type of Trader

	Bicycle trader		Beach-side trader		Pick-up trader	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Nile Perch						
Quantities traded (kg/month)	240	.	.	.	160	.
Buying price (Shs/kg)	1,000	.	.	.	500	.
Selling price (Shs/kg)	2,000	.	.	.	700	.
Cost of raw fish (Shs/month)	240,000	.	.	.	80,000	.
Gross revenue (Shs/month)	480,000	.	.	.	112,000	.
Net revenue (Shs/month)	204,435	.	.	.	8,752	.
Nile Tilapia						
Quantities traded (kg/month)	.	.	87	54	3,867	3,511
Buying price (Shs/kg)	.	.	500	0	767	57
Selling price (Shs/kg)	.	.	700	0	1,167	152
Cost of raw fish (Shs/month)	.	.	43,500	27,000	2,853,333	2,479,139
Gross revenue (Shs/month)	.	.	60,900	37,800	4,300,000	3,622,098
Net revenue (Shs/month)	.	.	12,954	8,041	278,261	1,184,575
Mukene						
Quantities traded (kg/month)	.	.	.	.	400	.
Buying price (Shs/kg)	.	.	.	.	700	.
Selling price (Shs/kg)	.	.	.	.	1,000	.

	Bicycle trader		Beach-side trader		Pick-up trader	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Cost of raw fish (Shs/month)	.	.	.	.	280,000	.
Gross revenue (Shs/month)	.	.	.	.	400,000	.
Net revenue (Shs/month)	.	.	.	.	120,000	.

Source: FIRRI, survey data September 2002

Traders in Bwondha reported that the supply of fish was poor (7) 70%, fair (1) 10%and good (2) 20%. The poor supply was attributed to Bad season 50%, demand by factory agents 40% and too many local competitors 10%. The main destination for fish is urban markets 50%.

6.5 Fish Consumption

6.5.1 Consumers' Characteristics

A total of 68 fish consumers were interviewed at Bwondha Landing Site. The majority were of the Basoga tribe (57.4%), followed by the Baganda (16.2%). Other tribes included the Samia, Banyarwanda, Bakenye, Banyoli and Adholas. Most (61.2.6%) of the respondents were males and (32.8%) were women. The majority (85.3%) of the respondents were married, 8.8% single, 4.4% separated and 1.5 divorced. The majority 67.6% had attained primary education, 7.4% secondary, 1.5% University education while 23.5% had not been to school. Among the respondents interviewed, 66.2% bought their fish for household consumption while the others got from their boats.

6.5.2 Consumption levels and trends.

The fishers of Bwondha mainly consumed tilapia (80.9.1%) and Nile perch (16.2%). In the sample 85.3% of the respondents reported that there has been a decline in fish consumption levels over the past one year.

The average quantity of fish consumed by households was 1.1 kgs per day and this ranged between 0.2 and 3 kgs. Household and per capita quantities consumed varied between sub-sectors and fish species as provided in Table 6.17. Most respondents (85.3) reported a change over the years in the quantities consumed by their household members with 70.3% saying that they had decreased, 2.1% saying that the quantities had increased and 26.6% had no comment.

On average, fish was consumed 2.3 times a week with variations between sub-sectors and the most common species consumed as given in Table 6.17. Most respondents (69.1%) reported a change in frequency of fish consumption over the past year with 66.2% saying it had decreased. A few (2.4%), however, said it had increased. A majority of respondents (80.8%) also reported a change in the sizes of fish they ate with their families over the past year and 55.83% said that the sizes had decreased while 25.0% said they had increased.

A majority of respondents (41.2%) mentioned vegetables as the main substitute to fish followed by beans (29.4%), others (16.2%), meat (4.4%) and Ground nuts (7.4%).

Most respondents (75.0%) reported a change in prices of fish for consumption over the past year and 60.3% of these reported an increase. The consumer prices of fish species varied among the different sub-sectors as indicated in 6.17

The results indicate that the local traders' household per capita consumption was highest (6.2 kg/month) as opposed to fish producers (4.1 kg/month), non-fishery consumers (3.0 kg/month) and local processors (1.9 kg/month). Among those who mainly ate Nile perch, local fish processors reported the highest per capita consumption (7.4 kg/month), followed by fish producers (4.8kg/month), while local traders had the least (1.3 kg/month). For the tilapia consumers, fish producers reported the highest per capita consumption (3.8 kg /month) while local processors reported the least (2.1 kg/month). Consumers not involved in fishery activities consumed 2.4 kg/month.

Table 6.17: Consumption Data by Category of Consumers

	Non-fishery consumers		Local traders		Local processors		Fish producers	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Household size	4.3	3.1	5.0	.0	6.3	2.8	5.0	.0
Household consumption (kg/day)	.9	.8	2.0	1.3	2.1	1.8	1.8	1.1
Per capita consumption (kg/day)	.3	.2	.4	.3	.3	.2	.4	.2
No. of times per week	5.7	7.7	3.5	1.6	3.0	2.0	3.1	1.6
Per capita consumption (kg/month)	5.1	5.6	6.1	5.4	3.7	3.6	4.6	3.8
Nile perch								
Per capita consumption (kg/month)	5.9	6.5	6.3	4.2	1.6	.5	6.0	3.9
Price/ kg	1,675	788	1,666	577	900	173	.	.
Cost of fish (Shs/month)	9,116	8,895	10,133	6,466	1,325	598	.	.
Nile tilapia								
Per capita consumption (kg/month)	3.0	.0	2.9	.9	3.7	2.9	3.0	1.5
Price/ kg	1,500	.	1,063	456	1,166	763	1,166	360
Cost of fish (Shs/month)	4,500	.	3,109	2,032	3,166	1,040	3,122	2,009
Other species								
Per capita consumption (kg/month)	.	.	12.8	13.6	.	.	.	.
Price/ kg	.	.	1,500	.	.	.	.	.
Cost of fish (Shs/month)	.	.	4,800	.	.	.	.	.

Source: FIRRI survey data 2002

6.6 Community Perceptions towards Chilled Facilities

Nearly all (36) the fish producers reported that the factory trucks had brought about positive changes in terms of increased fish prices (35.9%) and have helped establish ready markets (56.4%) for their fish. In addition, about 90% of the fish producers did not associate the operation of the factory trucks with any negative impacts with only a few (3) reporting that fish factories dictate upon fish prices. Neither the non-fishery consumers (9) nor the fish traders (2) attached any positive significance to the factory trucks at the landing. However, the non-fishery consumers reported that as a result of the factory trucks, there has been reduced fish for consumption (60%) and an increase in fish prices (40%).

7. BUMERU (B) LANDING SITE

7.1 Background

Bumeru (B) Landing Site, located in Mutumba Sub-county in Bugiri District was selected as the beach not accessed by fish factory trucks although may be accessed by factory/boat agents in Zone 3. The beach has a population of 600 people. The main economic activities at the beach are fishing, livestock keeping, crop farming and trading. Bugiri is one of the riparian districts of Lake Victoria grouped in Zone 3 (see map). In total, there are 74 landing sites, 5,292 fishermen and 2,044 boats in the district.

The rates given in Table 7.1 below are charged for the various fishery activities and vessels.

Table 7.1: Rates Charged by Bugiri District on Fishery Activities and Fishing Vessels: 2002/3

Type of licence	Rate (Shs)
Fishing vessel (Ssesse >5 metres)	30,000
Fishing permits	5,000
Specific licence fees	250,000

Source: Bugiri District records

Trucks from fish processing plants began operating in Bugiri District in August 2001. There are three regular trucks from the fish factories of Masese Fish Packers Ltd., Marine and Agro Fish Processing Company and Gomba Fish Factory Limited all from Jinja. In the whole district, trucks operate at Busiro and Wakawaka Landing Sites. However, even before the coming of trucks in the district, insulated boats were operating at the island beaches of Golofa, Singira, Hama and Maninga ferrying Nile perch to Kenya. However, the practice was stopped when security was tightened at the Uganda-Kenya border. Therefore, fish is now ferried to the mainland beaches of Busiro and Wakawaka, where factory trucks are now fully established.

As part of the district policy to encourage activities of factory trucks, the District Fisheries Department has facilitated and also been part of the operations to curb smuggling of Nile perch across the border. The district has also deployed personnel to attend to fishery activities at the two beaches were factory trucks are found. The district together with the fish factories has facilitated the construction of weighing shades at Busiro, Wakawaka, Golofa and Mamba. Toilets have also been constructed at Namatu, Singira and Hama to improve sanitation at the beaches. The roads to Busiro and Wakawaka have been properly graded to facilitate the movement of factory trucks.

The district has reported a number of positive impacts associated with factory. The incomes of fishers in the district are said to have increased as a result of the increase in price of a kilogram of Nile perch that is Shs 2,100. There are also increased employment opportunities for many youths at Busiro and Wakawaka. A good number of them are now employed as crews, bait suppliers and casual fish

labourers. There is improved sanitation and fish handling at beaches where these trucks are found. There is also improvement in the types and sizes of gear used. Most fishers use gillnets of mesh sizes above 5 inches to target the size of Nile perch demanded by factory trucks.

The artisanal processors, traders and local consumers, however, are affected in that they cannot compete for Nile perch with the truck traders who offer much higher prices. The district has encouraged fish farming to cater for the increasing demand of fish.

7.1.1 Infrastructure and Facilities

Below are the general facilities and infrastructure at Bumeru (B) (Table 7.2).

Table 7.2. Infrastructure and Facilities at Bumeru (B)

Infrastructure and facilities	Number
Retail shops	10
Food kiosks	5
Borehole	1
Drug shops	3
School	1
Latrine	Several latrines owned by households
Police post	1

Source: FIRRI, survey data September 2002

7.2 Fish Production Sub-sector

7.2.1 Overview

There is a boat-making yard at Bumeru (B). The main type of fishery is trolling with approximately 15 fishers, followed by gill netting (10 fishers), mosquito seining (10 fishers) and long lining (5 fishers).

There are approximately 40 fishing unit owners at Bumeru. There are 25 parachute boats and 15 Ssesse boats. Three fishing boats have outboard engines. There is one transport boat with outboard motor engine of Horsepower 15.

The main fish species landed is Nile perch followed by Mukene and then tilapia.

7.2.2 Fishers' Characteristics

The sample in the production study at Bumeru (B) consisted of 26 respondents, of whom all were male and their mean age was 30 years. The majority was of the Samia tribe (61.5%), followed by Adhola (15%) and other tribes (23.5%). All the respondents were married with an average family size of 5 members. Most fishers

(77%) had attained primary education and 23% had attained secondary level education. The mean number of years respondents had spent fishing was 7 while number of years lived at Bumeru (B) Beach was 6.

7.2.3 Fishing Inputs and Costs

Boats and engines

Some 85% of the fishers owned boats while 15% of them rented boats at an average cost of Shs. 18,900 per month. Most fishers (52%) owned "parachute" boats while 48% owned the Ssese type. Information on the boats used is given in the Table 7.3 below.

Table 7.3: Information on the Boats Owned

	Parachute boat		**Ssesse boat**	
	Mean	Std Deviation	Mean	Std Deviation
Cost price (Shs)	121,250	47,488.0	404,500	457,095.0
Salvage value (Shs)	3,333	11,547.0	50,000	81,649.7
Useful life (Years)	6	2.4	6	3.6
Years in operation	2	1.8	3	3.6

Source: FIRRI, survey data September 2002

Only 8% of the fishers own engines. Information on the engines used is given in Table 7.4 below.

Table 7.4: Characteristics of Engines Used

	Mean	**Std Deviation**
Cost price (Shs)	2,650,000	494,974.7
Salvage value (Shs)	450,000	636,396.1
Useful life (Years)	11	6.4
Years in operation	5	6.4

Source: FIRRI, survey data September 2002

Fishing gear

The main types of gear used as reported by respondents are shown in Table 7.5 below.

Table 7.5 Main Gear Types Used

Gear types	Count	Percentage
Mosquito nets	1	4
Long lines	8	30
Motorised gill netters	2	8
Non-Motorised gill netters	10	38
Trollers	5	20

Source: FIRRI, survey data September 2002

Table 7.6: Information on Gear Types Used

	Trolling		Long lines		Gill nets		Mosquito nets	
	Mean	Std Dev.	Mean	Std Dev.	Mean	Std Dev.	Mean	Std Dev.
Number per boat	1	.0	248	322.6	27	17.4	1	.
Size	10	2.2	8	.6	6	.7	.	.
Unit cost price (Shs)	110	54.8	58	18.9	15,667	12,325.8	250,000	.
Useful life (Shs)		.			1	.7		.
Salvage value (Shs)	0	.0	0	.0	0	.0	0	.

Source: FIRRI, survey data September 2002

Most fishers (50%) obtained their initial capital from fishing, followed by farming (30%), credit (4%) and other sources (15%).

Labour costs

The data on average number of crew members per boat, modes of payment and number of days fished per week are provided in Table 7.7 below:

Table 7.7: Payments to Production Labour

Enterprise	Average number of crew	Respondents employing % of revenue payment system	Respondents employing % of net revenue payment system	Mean number of days worked per week
Long lines	2	6	2	6
Motorised Gillnets	2	1	1	7
Non Motorised Gillnets	2	10	--	6
Trollers	2	5	--	7
Mosquito nets	4	--	1	4

Source: FIRRI, survey data September 2002

Other costs

Other operational costs, which include bait, fuel, boat and gear maintenance are given in Table 7.8. Based on the production data presented above, the monthly operating costs are computed as given by Table 7.8 below:

Table 7.8: Summary of Monthly Production Costs

	Paddled longlines - Nile perch	**Paddled trollers-Nile perch**	**Paddled gill netters-Nile perch**	**Motorized gill netter-Nile perch**	**Paddled gill netter-Tilapia**	**Mosquito nets-Mukene**
N= 26	8	5	2	2	8	1
Investment	166,694	127,110	1,220,000	4,090,000	420,625	670,000
Boat hire	0	0	0	0	2,205	0
Engine hire	0	0	0	0	0	0
Labour costs	47,088	38,277	41,000	144,550	20,454	7,920
Fuel	0	0	0	59,500	0	0
Bait	22,313	1,080	0	0	0	0
Boat maintenance	2,100	0	0	1,167	1,458	5,833
Gear maintenance	1,458	0	0	1,167	146	17,500
Engine maintenance	0	0	0	0	0	0
Other costs	0	0	0	0	0	0
Operating costs	**72,959**	**39,357**	**41,000**	**206,383**	**24,263**	**31,253**
Depreciation	2,366	360	7,985	20,927	10,681	13,245
Total costs	**75,325**	**39,717**	**48,985**	**227,310**	**34,944**	**44,498**
Quantities landed (kg)	110.01	55.02	55.00	225.75	83.30	132.00
Price/ kg	1,888	1,860	1,750	1,900	763	300
Gross revenue	207,972	101,830	107,000	416,500	61,880	39,600

Net revenue	**132,647**	**62,113**	**58,015**	**189,190**	**26,935**	**-4,898**

Source: FIRRI, survey data September 2002

7.2.4 Earnings of the Production Enterprises

Most respondents (65%) primarily target Nile perch, followed by tilapia (31%) and mukene (4%). Fish prices, monthly catches and revenues for the various enterprises and species are summarized in Table 7.9. Net revenues are derived by deducting monthly costs from gross revenues.

Most fishers (50%) sell their catch to factory agents and only at that beach. Most respondents (88%) had no arrangements with their buyers, a few (12%) had arrangements with buyers such credit in terms of money and fishing inputs. A large proportion of respondents (42%) mentioned farming as their alternative source of income, followed by trading (16%) and livestock (4%). Some respondents (38%) had no alternative source of income.

Table 7.9: Average Catches and Incomes of Fishers by Species.

Source: FIRRI, survey data September 2002

7.3 Fish Processing Sub-sector

7.3.1 Overview

There are no publicly owned fish processing facilities at Bumeru (B). Only mukene is processed at the beach.

7.4 Fish Marketing

7.4.1 Overview

Fish marketing at Bumeru (B) is facilitated by the presence of a good access road which is linked to the main Busia-Mayuge road. Namayingo is the nearest trading centre.

There are approximately 5 bicycle traders, 2 boat traders and 2 pick-up traders who buy fish at Bumeru (B). The main destinations of fresh tilapia is Busia while Nile perch is ferried to the factory trucks at Busiro.

The average prices of fresh fish per kg for the various fish species landed at Bumeru are given below (Table 7.10).

Table 7.10. Fresh Fish Prices by Species

Fish species	**Prices** (Shs/kg)
Nile perch	1,800
Tilapia	1,000

Source: FIRRI, survey data September 2002

7.4.2 Fish Traders' Characteristics

In total, there were six traders interviewed at Bumeru. (B) All respondents were male and married, of average age of 29 and had traded in fish for an average of 7 years. Most had primary-level education (83%) while others had attained secondary- level education (17%). Most of them were of the Samia tribe (67%), some (33%) belonged to other tribes. Fish traders were classified on the basis of the means of transport they use to transport their fish, and their distribution is given in Table 7.11

Table7.11: Distribution of Fish Traders in the Sample by Means of Transport

	Frequency	**Percentage**
Bicycle trader	3	50
Pick-up trader	2	33
Boat trader	1	17
Total	6	100.0

Source: FIRRI, survey data September 2002

7.4.3 Marketing Inputs and Costs

Assets of individual fish traders consisted of bicycles, motor cycles, fish baskets and boats. The fish traders reported wide variations in the capital investment with boat traders approximately investing Shs 5,000,000. The pick-up traders had no capital costs because they hired the services of the pick-ups either directly from the owners or from those who hired them. On average, they spent Shs 136,000 for the hire of pick-ups per month. Generally, pick-up traders had the highest labour costs (Shs 89,096). The costs incurred for each fish trading enterprises are presented in Table 7.12.

Table 7.12: Mean Input Costs of Fish Trading Units by Type of Trader by Species Traded.

	Bicycle trader		**Pick-up trader**		**Boat trader**	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Nile perch						
Capital Investment	61,750	13,788	.	.	5,000,000	.
Fuel	.	.	.	.	720,000	.
Ice	.	.	.	.	720,000	.
Labour	8,595	9,058	.	.	8,400	.
Operating costs	8,595	9,058	.	.	1,448,400	.
Depreciation	1,143	91	.	.	128,888	.
Total costs	9,738	9,149	.	.	1,577,288	.
Nile tilapia						
Capital investment	32,000	.	.	.	.	.
Hire of pick-up	.	.	136,000	11,313	.	.
Labour	15,184	.	89,096	104,798	.	.
Operating costs	15,184	.	225,096	93,485	.	.
Depreciation	590	.	.	.	.	.
Total cost	15,774	.	225,096	93,485	.	.

Source: FIRRI, survey data September 2002

7.4.4 Marketing Outputs and Incomes

The main species of fish traded in is Nile perch and Nile Tilapia. The table below presents the quantities of fish traded, buying price, selling price, cost of raw fish and gross revenues.

Table 7.13: Average Cost of Raw Fish and Revenues of Fish Traders by Species and by Type of Trader

	Bicycle trader		Pick-up trader		Boat trader	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Nile Perch Quantities traded (kg/month)	70	71	.	.	8,000	.
Buying price (Shs /kg)	1,000	283	.	.	2,050	.
Selling price (Shs/kg)	1,250	354	.	.	2,250	.
Cost of raw fish (Shs./month)	60,000	50,912	.	.	16,400,000	.
Gross revenue (Shs./month)	75,000	63,640	.	.	18,000,000	.
Net revenue (Shs./month)	5,262	3,578	.	.	22,711	.
Nile Tilapia Quantities traded (kg/month)	160	.	2,400	1,131	.	.
Buying price (Shs. /kg)	1,000	.	850	212	.	.
Selling price (Shs./kg)	1,300	.	1,200	283	.	.
Cost of raw fish (Shs./month)	160,000	.	1,920,000	452,548	.	.
Gross revenue (Shs./month)	208,000	.	2,720,000	678,823	.	.
Net revenue (Shs./month)	32,226	.	574,904	132,789	.	.

Source: FIRRI, survey data September 2002

7.5 Fish Consumption

7.5.1 Consumers' characteristics

A total of 41 heads of household were interviewed about the levels and trends of fish consumption and prices at Bumeru (B). 9 respondents where not employed in any fish related activity although they were residing at the beach, 26 were fish producers and another 6 were fish traders. They were of average age of 30 years and 95% were male while 5% were females. They were predominantly of the Samia tribe (68%) and other tribes (32%). Most respondents (95%) were married and had attained primary level education (75%) followed by those who had secondary level education (22%). The average household size of fish consumers was 4 family members and they had lived at Bumeru (B) for an average of 6 years.

7.5.2 Consumption levels and trends

Most households (58%) commonly consumed tilapia, followed by those who consumed Nile perch (39%) and Mukene (3%) (see Table 7.14). The average daily quantity consumed by households was 1.9 kgs per day and this ranged between 0.5 to 7.5 kgs. The quantities consumed by households varied between sub-sectors. Table 7.14 provides the information on average quantities consumed by common species and sub-sector of consumers. Most respondents (85%) reported a change over the years in the quantities of fish eaten with 95% saying that the quantities consumed by their families had decreased and only 5% saying they increased.

The average number of times fish was consumed was 3.4 times a week with variations between sub-sectors and common species consumed as given in Table 7.14. Most respondents (71%) reported a change in frequency of fish consumption over the past year with all saying it had reduced. A majority of respondents (68%) also reported a change in the sizes of fish they ate within their households over the past year and 78% said that the sizes had decreased while 22% said the sizes had increased.

Most respondents (51%) usually bought the fish they ate with their families, particularly the consumers not involved in fish production. A few (49%) did not buy fish for home consumption. Most respondents (65%) reported a change in prices of fish for consumption over the past year and 93% reported an increase. The prices of fish by species varied among the different sub-sectors as indicated in Table 7.14.

A large proportion of respondents (46%) mentioned vegetables as the main substitute to fish, followed by beans (37%) and other substitutes (17%).

Table 7.14: Household/per Capita Quantities, Frequency and Prices of Fish Species for Consumption by Sub-sector at Bumeru (B)

	Non-fishery consumers		**Local traders**		**Fish producers**	
	Mean	Std Deviation	Mean	Std Deviation	Mean	Std Deviation
Household size	4.1	2.7	4.5	3.1	5.0	.0
Household consumption (kg/day)	1.5	.6	2.0	.0	1.9	1.4
Per capita consumption (kg/day)	.5	.5	.7	.7	.4	.3
No. of times per week	2.1	.9	2.5	.6	4.0	1.8
Per capita consumption (kg/month)	3.6	2.2	7.7	8.3	6.6	7.9
Nile perch						
Per capita consumption (kg/month)	2.0	.	3.6	1.5	5.4	2.8
Price/ kg	.	.	1,783	275	1,400	.
Cost of fish (kg/month)	.	.	6,586	3,000	5,600	.
Nile tilapia						
Per capita consumption (kg/month)	2.4	.8	2.7	.6	3.7	1.9
Price/ kg	933	550	900	173	1,042	454
Cost of fish (Shs/month)	2,583	1,809	2,366	550	4,057	2,308
Mukene						
Per capita consumption (kg/month)	6.4	.	.	.	.	.
Price/ kg	.	.	.	.	.	.
Cost of fish (Shs/month)	.	.	.	.	.	.

Source: FIRRI survey data, September 2002.

7.6 Community Perceptions towards Chilled Facilities

According to the fish producers (26), the operation of the factory trucks has brought about positive changes ranging from high fish prices (30.8%), ready market (53.8%), reduced transport costs (3.8%) and have enabled them acquire ice (3.8%) to preserve their fish. Only a few fish producers associated the factory trucks with negative impacts such as their price dictating ways (3.8%) and fish trading (3.8%) on the lake. Nearly all the non-fishery consumers and fish traders (19) reported that the operation of the factory trucks has not positively affected their livelihood. On the contrary, the fish traders reported that the demand by the factory trucks had resulted in reduced fish supplies (20%) and high fish prices (80%) while the non-fishery consumers associated the factory trucks with reduced fish consumption (33.3%) and high fish prices (66.7%).

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Appendix 1: PRINCIPAL PERSONS MET

Mr. Mukasa Bukenya	DFO, Masaka District
Mr. Moses Semambo	AFO, Ddimo Landing Site
Mr. Ali Munyami	DFO, Mpigi District
Mr. Dezideriyo Wamala	Vice/Gabunga, Saanya Landing Site
Mr. Michael Lubulwa	DFO, Wakiso District
Mr. Christopher Othieno	AFO, Kasenyi Landing Site
Mr. Romulus Mulambi	DFO, Mukono District
Mrs. Nakaziba Sarah	DFO, Mayuge District
Mr. Joseph Nmbale	AFO, Bwondha Landing Site
Mr. Fred Igoma	DFO, Bugiri District
Mr. Wafula	Gabunga, Bumeru Landing Site

Appendix 2: EXTRACT FROM THE FISHING (AMENDMENT) RULES, 2001 FOR LAKE VICTORIA

STATUTORY INSTRUMENTS
SUPPLEMENT No. 41 7th December,2001

STATUTORY INSTRUMENTS SUPPLEMENT

to The Uganda Gazette No. 78 Volume XCIV dated 7th December, 2001.

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S T A T U T O R Y I N S T R U M E N T S
2001 No. 73
The Fishing (Amendment) Rules, 2001.

(Mode under section 43 of the Fish Act, Cap. 228)

IN EXERCISE of the powers conferred upon the Minister responsible for fisheries by section 43 of the Fish Act, these Rules are made this 28th day of November 2001. Cap. 228.

1. These Rules may be cited as the Fishing (Amendment) Rules, 2001 and shall be read as one with the Fishing Rules, 1964 Title. S.1.228-6

2. The Fourth Schedule to the Fishing Rules, 1964 is repealed and substituted with the Schedule to these Rules Substitution of Fourth Schedule

SCHEDULE
FOURTH SCHEDULE Rule 12
PART 1

Waters	Fishing Vessel Licence section 7(1)a of the Act			Specific Licence section 9(2) of the Act		
	CITIZENS			NON CITIZENS		
	LOA<5m	LOA5-11m	LOA>11m	LOA<5m	LOA5-11m	LOA>11m
L. Victoria	20,000	30,000	50,000	200,000	500,000	1,000,000

Waters	PART II					
	SPECIFIC LICENCES section 8(1)b of the Act					
	TRUCK BASED			VESSEL BASED		
	GRT<5t	GRT5-10t	GRT>10t	LOA<11m	LOA11-15m	LOA>15m
L. Victoria (U)	250,000	250,000	500,000	230,000	500,000	1,000,000

DR. KISAMBA MUGERWA
Minister of Agriculture, Animal Industry and Fisheries