RESEARCH REPORT

GLOBALISATION AND FISH UTILISATION AND MARKETING STUDY

FISH EXPORTS AND LIVELIHOODS: *MONITORING SURVEYS ON LAKES KYOGA AND ALBERT, UGANDA*

SOCIO-ECONOMICS SECTION

FISHERIES RESOURCES RESEARCH INSTITUTE

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ACRONYMS

ADB	African Development Bank
BMUs	Beach Management Units
DRC	Democratic Republic of Congo
DFR	Department of Fisheries Resources
FIRRI	Fisheries Resources Research Institute
IFAD	International Fund for Agricultural Development
LGDP	Local Government Development Project
PAF	Poverty Alleviation Fund

EXECUTIVE SUMMARY

Introduction

1. A survey designed to examine the impacts of fish exports on the artisanal fisheries of Lake Kyoga and Albert was carried out in 2002. A monitoring survey was conducted in 2003 and comparisons made with the findings of the previous year to determine temporal changes in relation to the impacts of the trade on livelihoods in the artisanal fisheries.

Methodology

2. The six beaches surveyed in 2002 were revisited; two where chilled transport facilities were already in operation, two where they were not in operation but were expected during the projects life and two where they were not expected throughout the projects life. The selected beaches on Lake Kyoga were Kansira in Nakasongola, Kayei in Apac and Iremeria in Kamuli while Kabolwa and Somsoi in Masindi and Runga in Hoima were selected on Lake Albert. However, the team was unable to carry out the monitoring survey at Wansolo in Apac District and Bikunyu in Hoima District.

Findings

3. The number of refrigerated trucks in Nakasongola and Kamuli had decreased mainly due to fish supply constraints while they had ceased their operations in Apac largely due to locational disadvantages that made it more cost effective to access Nile perch supplies by boat rather than by trucks. Consequently, Nile perch and Tilapia prices in Apac had declined significantly despite the continued operation of boat-based factory agents.

4. The number of refrigerated trucks in Masindi had increased from 8 to 20 coupled with the intensification of operations of boat-based factory agents while in Hoima they had reduced from 7 to 2 due to poor accessibility of the beaches compounded by the close proximity of the escarpment to the beaches. Boat-based factory agents therefore delivered most of the Nile perch landed in Hoima to trucks based in Masindi.

5. The catches from the districts north of Lake Kyoga were increasingly being delivered to districts south of the lake to the extent that the recorded Nile perch and Tilapia catches in southern districts such as Nakasongola had increased by almost 20 times.

6. The influence of the fish export trade on Lake Kyoga is so widespread as a result of the extensive network of truck and boat-based factory agents, who buy most of the Nile perch landed, provided it meets their requirements. For instance, at Iremeria, where the influence of the trade was not expected

throughout the projects life, bicycle traders were delivering Nile perch to refrigerated trucks stationed at nearby beaches and trading centre.

9. No refrigerated trucks were operating at the selected beaches of Lake Albert. Nevertheless, the influence of the trade was present at the beaches involving boat-based operators delivering fish to nearby beaches where trucks were present. In addition, the trade had attracted 'outsiders' with more advanced fishing and marketing technologies from Lake Victoria, who are taking advantage of the less competitive business prospects provided by the trade.

10. Total catches of Nile perch in Masindi despite declining from about 802 to 580 metric tonnes in the past year, increased in value terms due to large increases in prices attributed to the trade.

11. The investment costs per fishing enterprise decreased mainly due to reduced investment on fishing gear particularly of gill nets, an indication that the disposable incomes available for replacement of worn-out, stolen or lost gear had declined.

12. The levels of gill net fishing on Lake Albert had drastically reduced due to the widespread confiscation of gill nets below 4" by staff contracted by DFR while the use of longlines and perforated troughs had gained prominence. However, the reduction in the levels of gill net fishing had affected fishers targeting Hydrocynus and Alestes baremose most essentially because these species require mesh sizes below 4".

13. The costs of fishing had also declined with a few exceptional cases where they increased slightly. The decline in fishing costs was mainly attributed to the reduced labour costs. Given that labour costs are directly proportional to gross revenues, the reduced labour costs are an indication that revenues from fishing had declined.

14. The average Nile perch prices at the selected beaches had increased from 1,150 to 1400 Ug. Shs/ kg for Lake Kyoga and 850 to 1000 Ug. Shs/ kg for Lake Albert. However, the significant declines in catch rates for most Nile perch targeting enterprises had eroded the gains from increased prices with the effect that the enterprises realized reduced net incomes. Similarly, the net incomes of Tilapia fishing enterprises at the selected beaches on Lake Kyoga had declined despite increases in the average prices from 750 Ug. Shs/ kg to 850 Ug. Shs/ kg due to decreased catch rates.

15. The level of fish smoking in terms of number of kilns had declined substantially on both lakes and at some landings had died out while salting/ sun drying of Tilapia on Lake Kyoga and sun drying of *Brycinus nurse* on Lake Albert had become the most common processing methods. However, the few fish smokers enjoyed wider price margins and had increased the

quantities of fish processed thus improved net incomes. Salting of fish had persisted because its not dependant on the availability of Nile perch as opposed to smoking.

16. Similarly, the levels of artisanal fish marketing in terms of number of marketing intermediaries including factory agents had generally declined largely due to fish supply constraints and the poor condition of the access roads to the beaches.

17. Consumption of Nile perch at beach level was basically limited to households dependent on fishers who targeted it. Consumer prices of Nile perch increased from 750 to 1400 Ug. Shs/ kg on the Lake Kyoga beaches, an indication that the supply of immature Nile perch and factory rejects for home consumption even at beach level had declined. Consumption of Tilapia was still widespread among fishing communities with modest changes in the per capita consumption levels. Consumer prices on the Lake Kyoga beaches however increased from 720 to 950 Ug. Shs/ kg.

18. The scarcity of Nile perch for home consumption on the Lake Albert beaches was to some extent counterbalanced by the availability of other species such as *Hydrocynus, Alestes baremose* and *Bagrus bayad*. The consumer prices of Nile perch at the selected beaches increased from 760 to 950 Ug. Shs/ kg while that of Tilapia increased from 740 to 1000 Ug. Shs/ kg.

19. In conclusion, the number of factory trucks has reduced on both lakes, however, their presence at some beaches has led to improvements in the livelihoods of fishers as reflected by their higher incomes. Local authorities have also benefited from improved revenue collection and this explains why districts have supported the operations of chilled transport facilities through provision of public facilities and infrastructure.

20. The presence of chilled transport facilities at beaches has continued to displace local processors and traders and considerably reduced incomes for the remaining processors and traders. Therefore, it is important to reconsider the policy on fish export trade taking into account the number and capacities of the existing factories.

21. The presence of chilled transport facilities on Lake Albert has also attracted new fishers from Lake Victoria, West Nile and DRC hence leading to increase in fishing effort. It was also reported that there were declines in Nile perch catches landed attributed to suspected decline in stocks. Therefore, there is need to control fishing effort and to undertake stock and catch assessment studies.

1. INTRODUCTION

The Globalisation and Fish Utilisation and Marketing 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 on the study 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.

During the first quarter, namely April-to-June, 2002, work was done on Lakes Kyoga and Albert and the focus was on the economic structure of fish landings. In the second quarter a similar study was carried out at six beaches on Lake Victoria. In the third quarter a survey of the fish factory by-product marketing chains and consumption patterns at distribution centres and roadside points was carried out. In the fourth quarter a survey of fish marketing chains and consumption patterns away from beaches of Lakes Victoria, Kyoga and Albert was also carried out.

In this quarter, the beaches selected in the first quarter on Lakes Kyoga and Albert were revisited (see Table 1). The objective was to monitor and update data on revenues, costs and prices of the identified economic sub-sectors (production, processing and marketing) and make comparisons with the data collected at those beaches in the first quarter. However, the main focus was to collect data at aggregate level.

Table 1: Selected landing sites

Selection Criteria	**Landing Sites**	
	Lake Kyoga	**Lake Albert**
Chilled transport facilities already operate.	Kansiira	Kabolwa
No chilled transport facilities expected throughout project's life.	Iremeria	Somsio
No chilled transport facilities but may become available during project's life.	Kayei	Runga

Data collection involved a review of records and reports at the district headquarters of Kamuli, Nakasongola and Apac for Lake Kyoga and Masindi and Hoima for Lake Albert. Key informant interviews were carried out with Department for Fisheries Resources staff and beach leaders.

1.2 FIELD WORKPLAN

Fieldwork activities were carried out in accordance with the work plan given in Table 2 below.

Table 2: Work Plan

Dates	**Activities**
5 September	Travel to Kamuli District Headquarters Meet with district officials Review official records and reports Travel to Irimaire Landing Site
6 September	Work at Irimaire Landing site
7 September	Travel to Nakasongola
8 September	Meet with Nakasongola District Headquarters officials Review official records and reports Travel to Kansiira Landing Site
9-10 September	Work at Kansiira Landing Site
11 September	Work at Kayei Landing Site
12 September	Travel to Apac District Headquarters and meet with district officials Review official records and reports Travel to Masindi District Headquarters and Meet with District officials and review official records and reports
13-14 September	Work at Kabolwa Landing Site
15 September	Work at Somsio Landing Site
16 September	Travel to Hoima District Headquarters Meet with district officials Review official records and reports Travel to Runga Landing Site
17 September	Work at Runga Landing Site
18 September	Return to Jinja
19 – 23 September	Data analysis Report writing Preparation of data collection plan and budget for sixth quarter

2. KANSIIRA LANDING SITE

2.1 Background

In the survey of 2002, Kansiira, located in Nakasongola District, was selected as the landing site where chilled transport facilities already operate on Lake Kyoga. During the monitoring survey of 2003, it was found out that the number of trucks at Kansiira had reduced from 2 to 1. The population of the beach had increased from approximately 600 to 1,500 people.

The number of landing sites in the whole district had reduced from 25 to 20 following the guidelines on BMU location that requires a minimum of 30 boats per landing site. Fishers had increased from 1,265 to 1,631 while boats had increased from 702 to 879 with an improvement in the level of motorisation of fishing boats. The increase in number of fishers and boats was attributed to immigration of fishers from the Northern districts of Apac and Lira and relocation of the majority of fishing communities living on sudds to landing sites in Nakasongola.

The main fish species landed in the district was tilapia followed by Nile perch. There was an increase in the catches landed in 2002 compared to 2001 (Table 2.1). This was attributed to improvements in recording of catches as result of deployment of more field staff and increase in catches of fish landed in Nakasongola from the northern districts of Apac and Lira. It was reported that boat traders ferry a lot of fish to Nakasongola District where better prices are offered owing to the presence of factory trucks that buy both Nile perch and tilapia.

Table 2.1: Estimated Fish Catches by Species, Weight and Value for Nakasongola District 2001 and 2002

Species	**Year**			
	2001		**2002**	
	Wt (kgs)	**Value** (Shs)	**Wt** (kgs)	**Value** (Shs)
Nile perch	21,326	26,739,600	547,760	592,029,300
Tilapia	82,264	114,863,700	1,119,515	973,978,800
Protopterus	636	508,800	362,061	187,044,980
Clarias	1,111	1,163,400	132,287	96,970,900
Momyrus	43	34,400	57,703	31,404,540
Barbus	6,190	8,020,800	5,997	4,413,200

Bagrus	68	68,000	77,984	46,228,690
Synodontis	-	-	1,649	839,800
Total	**111,638**	**151,398,700**	**2,304,956**	**1,933,090,210**

Source: Nakasongola District records

Factory trucks arrived in Nakasongola District in November 2001. There were 14 trucks operating in the district in 2002, however, they had decreased to an average of 10 (fluctuating between 8 and 12) at the time of the monitoring survey in 2003. The reduction in number of trucks was attributed to seasonal fluctuations in catches and suspected reduction in Nile perch stocks. Two trucks were buying tilapia for the Rwandan market while the rest were buying Nile perch for fish factories. Trucks were privately owned by agents who sold fish to any factory of their choice depending on the prices offered. The trucks were operating at the following beaches; Kansiira, Kikalaganya, Lwampanga, Zengebe, Kibuye and Kikoiro.

Before the arrival of trucks, the price of a kilogram of Nile perch was Ushs 500/=, however, it increased to Ushs 1,500/= per kg and during the monitoring survey it was established that prices ranged between Ushs1,200/= and 1,900/= while prices of tilapia ranged between Ushs 800/= and 1,000/= depending on the season.

During the monitoring survey, it was reported that revenue sources from fishery related activities such boat licensing and fishers' permits rose from Ushs 10 million in 2001/2 to Ushs 13,509,350/= in 2002/3 financial year. Fish movement permits are yet to be charged in the new financial year 2003/4.

The District Fisheries Officer continued to receive complaints from artisanal processors, traders and local consumers who could not compete for both Nile perch and tilapia with chilled transport operators since the latter offered much higher prices. Boat traders who are mainly agents of owners of trucks were still involved in buying fish on the lake, which affected collection of catch statistics at the landings and provided opportunities for fishing crews to cheat fishing unit owners.

2.2 Fish Production Sub-sector

2.2.1 Overview

During the monitoring survey, gill netting was mentioned as the major fishery as opposed to basket trapping, which was mentioned in 2002. Illegal gears notably boat seining and cast netting had also been phased out (Table 2.2).

Table 2.2: Production Enterprises by Number at Kansiira for 2002 and 2003

Category of gear user	Year	
	2002	2003
	Number	Number
Gill netting	35	40
Long lining	20	20
Basket trapping	40	10
Boat seining	30	-
Cast netting	1	-

Source: FIRRI, survey data

In the monitoring survey, it was reported that there was an increase in the number of fishing unit/boat owners and renters. The number of crews had reduced (Table 2.3). Only 2 traders owned boats with outboard engines. There were mainly two types of boats: parachute (60) and Ssesse (10).

Table 2.3: Number by Category of Employment of People in Fishery Related Activities at Kansiira for 2002 and 2003

Category of employment	Year	
	2002	2003
	Number	Number
Crews	100	50
Fishing boat owners	50	80
Fishing unit renters	20	50
Bait suppliers	-	10
Carrying fish	-	2
Gear suppliers/makers	-	2
Fuel dealers	-	1
Firewood suppliers	-	10
Boat makers/repairs	-	2

Source: FIRRI, survey data

There was an increase in the catches landed at Kansiira. In 2002, Nile perch was the main fish species landed at Kansiira, however, in the monitoring survey of 2003, estimated weekly quantities of tilapia catches landed were superseding those of Nile perch (Table 2.4). It was reported that there were seasonal variations in catches of *Synodontis, Clarias and Momyrus*.

Table 2.4: Estimated Weekly Quantities of Catches Landed at Kansiira for 2002 and 2003

Species	**Year**	
	2002	**2003**
	Wt (Kgs)	**Wt** (Kgs)
Nile perch	2,500	2,400
Tilapia	1,000	6,000
Clarias	600	600
Bagrus	1,000	300
Proteptorus	600	1,800
Momyrus	400	600
Synodontis	50	-

Source: FIRRI, survey data

2.2.2 Fishing Inputs and Costs

The investments costs declined for all fishing enterprises, decreasing by 47% and 56% for gill net and longline fishing units respectively. The reduced investment on fishing gear to a large extent accounted for the decline in investments costs of fishing enterprises. The reduced expenditure on fishing gear is in turn an indication that the disposal income available for replacement of worn-out, stolen or lost gear had declined.

Table 2.5: Average Fishing Inputs and Investment Costs

	Gear type			
	Longline		Gill nets	
	2002	2003	2002	2003
Nile perch				
Boat	130,000	180,000	193,125	276,000
Gear	407,167	19,200	828,500	371,667
Investment costs	450,500	199,200	983,000	601,667
Tilapia				
Boat	.	.	150,000	147,500
Gear	.	.	277,500	92,000
Investment costs	.	.	307,500	176,286
Other species				
Boat	.	50,000	120,000	.
Gear	6,000	44,860	26,000	.
Investment costs	6,000	54,860	146,000	.

Source: FIRRI, survey data

The costs of fishing had also declined for all fishing enterprises, reducing by about 23% and 52% for gill net and longline fishing units respectively. The decline in fishing costs was mainly attributed to the reduced expenditures on labour costs by fishing unit owners. Given that the crew share is directly proportional to the gross revenues, reduced labour costs is an indication that fishing revenues had declined.

Table 2.6 Average weekly Production costs

	Gear type			
	Longline		Gill nets	
	2002	2003	2002	2003
Nile perch				
Boat hire	17,500	.	33,125	12,500
Labour	39,380	16,800	63,316	51,530
Total costs	52,380	16,800	69,941	55,102
Tilapia				
Boat hire	.	.	26,500	5,167
Labour	.	.	24,298	21,890

Total costs	.	.	45,498	24,104
Other species				
Boat hire	16,000	4,250	.	.
Labour	10,800	11,261	15,900	.
Total costs	26,800	14,661	15,900	.

Source: FIRRI, survey data

2.2.3 Earnings of Production Enterprises

The catch rates for all types of fishing enterprises declined by about 31-40% possibly due to the reduced investment on fishing gear. The price of Nile perch increased by approximately, Ug. Shs 145 (about 12%) while that of Tilapia increased slightly by about Ug. Shs 38. The gross and net revenues for all types of fishing enterprises decreased in spite of the reduction of fishing costs, an indication that catch rates were the most important determinant of fishing incomes.

Table 2.7: Average Weekly Catches and Incomes of Fishers

	Gear type			
	Longline		Gill nets	
	2002	2003	2002	2003
Nile perch				
Quantities landed	81.3	56.0	126.3	71.6
Price/ kg	1,200	1,200	1,170	1,471
Gross revenue	97,085	67,200	139,856	105,161
Net revenue	44,705	50,400	69,915	50,059
Tilapia				
Quantities landed	.	.	110.7	66.4
Price/ kg	.	.	733	771
Gross revenue	.	.	82,565	51,529
Net revenue	.	.	37,068	27,424
Other species				
Quantities landed	90.0	59.6	106.0	15.8
Price/ kg	300	950	500	1,000
Gross revenue	27,000	39,283	53,000	.
Net revenue	200	24,623	37,100	.

Source: FIRRI, survey data

2.3 Fish Processing Sub-sector

2.3.1 Overview

In the survey of 2002, smoking was the main fish processing method, however, in 2003, salting was reported to be the main processing method. The number of privately owned smoking kilns had reduced from 25 to 10 while the number of drying racks had increased from 3 to 20. It was reported that the number of processors engaged in salting was likely to increase following the recent relocation of some community members that were living on the sudds where salting was the main processing method.

2.3.2 Input and costs

The investments costs of fish smokers in terms of the overall cost of construction of smoking kilns increased, reflecting differences in the type and quantities of materials used to construct smoking kilns. Processors who salted/ sun-dried Tilapia incurred much smaller investment costs involving the construction of low-cost drying racks.

Table 2.7: Average Processing Investment Costs

	Smoking kiln		Drying rack	
	2003	2002	2003	2002
Tilapia				
Cost of smoking kiln	100,000	35,000	.	
Cost of wire mesh	56,000	31,375	.	
Investment costs	156,000	66,375	.	
Cost of drying rack	.		9,333	
Investment costs	.		9,333	

Source: FIRRI, survey data

2.3.3 Other costs

The costs of smoking for Nile perch processors declined by about 83% while that of Tilapia processors increased by about 142%. Processors who salted/ sun-dried Tilapia incurred less costs as compared to their counterparts who smoked Tilapia. The reduction in the costs of smoking for Nile perch processors was mainly attributed to reduced expenditure on firewood and labour.

Table 2.7: Weekly Operating Costs of Processing Units

	Smoking kilns		Drying racks	
	2003	2002	2003	2002
Nile perch				
Hire of smoking kiln	500	1,000	.	
Firewood	2,000	16,644	.	
Labour	2,000	9,889	.	
Depreciation	.	390	.	
Total costs	4,500	27,059	.	
Tilapia				
Hire of smoking kiln	2,500	1,000	.	
Firewood	25,500	7,929	.	
Salt	.		10,550	
Transport	10,000		37,500	
Labour	11,167	10,143	7,125	
Depreciation	150	249	140	
Total costs	45,050	18,642	27,155	

Source: FIRRI, survey data

2.3.4 Processors Outputs and Incomes

In spite of the decrease in the number of smoking kilns at Kansira, it appears that the performance of fish processing enterprises improved. The quantities processed for Nile perch and Tilapia smokers increased by 41% and 8.2% respectively. However, the price margins received for each kilogram of processed fish decreased by Ug. Shs 35-100. Nonetheless, the gross revenues and net profits of Nile perch and Tilapia smokers increased, the main factor being the increased quantities processed.

Table 2.8: Average weekly Cost of Raw Fish and Revenues

	Smoking kiln		Drying rack	
	2003	**2002**	**2003**	**2002**
Nile perch				
Quantities processed	200.0	142.2	.	
Buying price/ kg	600	633	.	
Selling price/ kg	1,100	1,167	.	
Cost of fish	104,500	83,056	.	
Gross revenue	160,500	142,333	.	
Net revenue	51,500	32,219	.	
Tilapia				
Quantities processed	160.0	147.9	241.9	
Buying price/ kg	800	843	700	
Selling price/ kg	1,375	1,514	900	
Cost of fish	255,667	101,714	167,813	
Gross revenue	442,333	210,429	216,188	
Net revenue	141,617	90,072	21,220	
Other species				
Quantities processed	52.5	30.0	.	
Buying price/ kg	425	400	.	
Selling price/ kg	1,000	1,000	.	

Source: FIRRI survey data

2.4 Fish Marketing

2.4.1 Overview

The access roads to Kansiira were in a poorer state compared to the time of visit in 2002, hence, constraining the movement of trucks to the beach. The number of truck and pick-up traders had reduced. The only truck trader found at the beach was dealing in both fresh Nile perch and tilapia and delivering it to

factories in Kampala. The truck trader buys approximately 1.5 tons and 1 ton of Nile perch and tilapia respectively per week. Much of the smoked fish is sold in Gulu while the salted one is sold in the Democratic Republic of Congo (DRC).

Table 2.9: Number by Category of Traders at Kansiira for 2002 and 2003

Category of processors	Year	
	2002	2003
	Number	Number
Bicycle trader	3	3
Truck trader	2	1
Boat Trader	2	2
Pick-up trader	2	1

Source: FIRRI, survey data

2.5 Fish Consumption

Consumption of Nile perch was most common among households that were supported by fishermen who targeted it. The fish processors who processed it rarely retained some for home consumption and instead preferred to buy other species for consumption. The weekly per capita consumption levels of Tilapia varied between 1.1-1.8 kg while the consumer prices slightly differed from those of the previous year. Consumption of other species such as Protopterus and Clarias was mainly limited to households dependent on fishermen who target them.

Table 2.10 Consumption Levels and prices

	Non fishery consumers		Fish producers		Fish processors		Fish traders	
	2003	2002	2003	2002	2003	2002	2003	2002

Nile Perch								
Household size	.		6	9	.		.	
Household consumption (kg)	.		3.0	3.5	.		.	
Daily per capita consumption (kg)	.		.5	.4	.		.	
Frequency of consumption (days/ wk)	.		5	6	.		.	
Weekly per capita consumption (kg)	.		2.25	2.1	.		.	
Price (Shs/ kg)	.		.	.	.		.	
Weekly expenditure (Shs)	.		.	.	.		.	
Tilapia								
Household size	5	6	7	9	6	7	3	8
Household consumption (kg)	1.6	2.3	2.8	2.9	1.7	2.3	.8	3.4
Daily per capita consumption (kg)	.3	.4	.4	.3	.4	.4	.3	.6
Frequency of consumption (days/ wk)	4	3	5	4	5	4	6	4
Weekly per capita consumption (kg)	1.1	1.3	2.2	1.4	1.8	1.4	1.7	2.2
Price (Shs/ kg)	789	838	743	783	725	694	1,000	840
Weekly expenditure (Shs)	4,618	5,870	10,886	13,200	5,438	5,556	4,000	12,200

Source FIRRI survey data

3.0. KAYEI LANDING SITE

3.1 Background

In the survey of 2002, Wansolo Landing Site, located in Apac District, was selected as the landing site where chilled transport facilities had not reached but were expected during the lifetime of the project. However, during the monitoring survey of 2003, the research team was unable to work at the beach due to the prevailing insecurity conditions sparked off by misunderstandings between the fishermen and revenue collectors that left two people dead. Wansolo was, therefore, substituted with Kayei Landing Site, which is also found in Apac District and was secure with similar characteristics of Wansolo.

Chilled transport facilities arrived in Apac District in October 2001 and were operating at Kayei (2 trucks) and Wigweng (1 truck) Landing Sites. There were no trucks at Wansolo because of the poor access road and boat traders bought Nile perch from Wansolo and ferried it to Kayei and Wigweng or to landing sites in Nakasongola District. However, by August 2003, factory trucks had ceased operating in Apac district. This was attributed to reduction in catches landed of Nile perch and tilapia as a result of sale of fish on the lake, loss of fishing gear as a result of drifting by sudds and relocation of a majority of the community that were occupying the sudds who were a key source of fish for the truck trader in Kayei to Nakasongola. Upon relocation of the sudd community, the only truck trader that was still at Kayei also relocated to beaches in Nakasongola. Coupled with above reasons, were the higher transport costs involved in delivering fish from Kayei other than Nakasongola District and inconveniences caused by the ferry that links Masindi port to Kungu Landing Site in Apac whenever it failed to keep the daily movement schedules due to lack of fuel. It was reported that five boats deliver both Nile perch and tilapia to Nakasongola and mainly operate at Atuna, Wigweng, Ambali, Wansolo, Kayei and Kiiga Landing Sites.

The number of beaches in Apac District had increased from approximately 38 in 2002 to 45 in 2003, the number of boats had increased from 518 to 2194.

Before the arrival of chilled transport facilities, the price of a Kilogram of Nile perch at beaches was U. shs 300/=, which increased to U. shs 1,200 per kg and during the monitoring survey in 2003, it was reported that when the factory truck was still at Kayei, prices of Nile perch and tilapia per kilogram were U. shs 1700/= and U. shs 1200/= respectively. These had dropped to U. 1500/= and U. shs 600/= respectively when the trucks left.

Artisanal processors, traders and local consumers are faced with competition from the boat traders who offer better prices for both tilapia and Nile perch and also have a habit of buying fish on the lake. The fishing unit owners have subsequently lost income as a result of crews not declaring all incomes accruing from the sales. The practice also undermines fish inspection and recording of statistics.

3.2 Fish Production

3.2.1 Overview

Gillnetting was the main fishery, followed by long lining, basket trapping and beach seining (Table 3.2).

Table 3.2: Production Enterprises by Number at Kayei for 2003

Category of gear User	Number
Gill netting	180
Long lining	30
Basket trapping	20
Beach seining	8

Source: FIRRI, survey data

There were approximately 360 parachute boats owned by approximately 60 fishers, 120 boat renters and 150 crewmembers. This implies that most fishers owned more than one boat and therefore rented out to others. Most boats were operated either by the owner or renter with 1 crew. There were 4 trading boats with outboard engines.

Table 3.3: Number by Category of Employment of People in Fishery Activities at Kayei

Category of employment	Number
Crews	150
Fishing boat owners	60
Fishing unit renters	120
Bait suppliers	3
Carrying fish	-
Gear suppliers/makers	5
Fuel dealers	2
Firewood suppliers	20
Boat makers/repairs	2

Source: FIRRI, survey data

The main fish species landed was tilapia with approximately 8400 Kgs landed per week followed by Nile perch, *Clarias*, proteptorus and Bagrus (Table 3.4).

Table 3.4: Estimated weekly quantities catches landed at Kayei 2003

Fish species	**Wt (Kgs)**
Tilapia	8,400
Nile perch	2,100
Clarias	700
Bagrus	70
Proteptorus	700

Source: FIRRI, survey data

3.2.2 Fishing Inputs and Costs

The investment costs of gill net fishing units generally declined, dropping by about 58% for Nile perch targeting enterprises mainly due to reduced investment on gill nets. Owners of longline fishing enterprises targeting Nile perch had investment costs of about 74,000 Shs/ unit, considerably lower than the investment requirements for the gill net fishery.

Table 3.5: Average Fishing Input and Investment Costs

	Gear type			
	Longline		**Gill nets**	
	2002	2003	2002	2003
Nile perch				
Boat	.	120,000	177,308	123,333
Gear	.	14,000	313,500	210,429
Investment costs	.	74,000	478,143	263,286
Tilapia				
Boat	.	.	152,500	165,000
Gear	.	.	118,000	227,667
Investment costs	.	.	270,500	337,667
Other species				
Boat	150,000	.	.	.
Gear	1,000,000	.	.	42,000
Investment costs	1,150,000	.	.	42,000

Source FIRRI survey data

The cost of fishing for gill net fishing units targeting Nile perch declined by about 28% and was mainly attributed to reduced expenditure on labour while Tilapia fishing costs changed slightly. The costs of fishing of longline fishing were higher than for gill net fishing because the former incurred higher labour costs and additional bait costs.

Table 3.6: Average Weekly Production Costs

	Gear type			
	Longline		Gill nets	
Nile perch				
Boat hire	.	6,000	30,000	5,750
Labour	.	44,500	36,963	30,100
Total costs	.	47,500	39,106	33,386
Tilapia				
Boat hire	.	.	.	6,000
Labour	.	.	40,005	133,589
Total costs	.	.	40,005	135,589
Other species				
Boat hire	.	.	.	6,000
Labour	5,760	.	.	12,000
Total costs	5,760	.	.	18,000

Source FIRRI survey data

3.2.3 Earnings of Fish Production Enterprises

Longline fishing units had higher catch rates, received slightly higher prices of Nile perch and therefore earned higher net profits than owners of gill net fishing units. There was a moderate improvement in catch rates of gill net fishing units targeting Nile perch, a 13% increase in the price per kg of Nile perch and therefore a modest increase in net profits. For tilapia targeting units, the performance of gill net enterprises was more or less the same with only slight increases in catch rates and tilapia prices.

Table 3.7: Average Weekly Catches and Incomes of Fishers

	Gear type			
	Longline		Gill nets	
	2002	2003	2002	2003

Nile perch				
Quantities landed	.	120.0	66.5	62.8
Price/ kg	.	950	1,171	1,356
Gross revenue	.	117,375	78,153	71,818
Net revenue	.	58,688	39,047	38,432
Tilapia				
Quantities landed	.	.	93.0	84,3
Price/ kg	.	.	675	793
Gross revenue	.	.	81,163	277,740
Net revenue	.	.	41,157	142,151
Other species				
Quantities landed	28.8	.	.	
Price/ kg	500	.	.	
Gross revenue	14,400	.	.	
Net revenue	8,640	.	.	

Source FIRRI survey data

3.3 Fish Processing

3.3.1 Overview

Fish smoking was the main fish processing method with approximately 60 processors utilizing approximately 40 privately owned smoking kilns, followed by salting with approximately 30 processors sharing 10 drying racks.

3.3.2 Processing Inputs and Costs

Most Nile perch smokers hired smoking kilns and therefore did not have investment costs. The investments costs of Tilapia smokers were more or less the same with those of the previous year.

Table 3.8: Processing Input and Investment Costs

	Smoking kilns	
	2003	**2002**
Tilapia		
Cost of smoking kiln	35,000	36,500
Investment costs	35,000	36,500

Source: FIRRI, survey data

The costs of smoking of Nile perch processors almost doubled due to additional transport costs incurred in 2003, an indication that processors sometimes combine processing and marketing functions. For the Tilapia smokers, there were slight changes in the costs of processing.

Table 3.9: Weekly Operating Costs of Processing Units

	Smoking kilns	
	2003	**2002**
Nile perch		
Hire of smoking kiln	3,000	750
Firewood	6,000	5,375
Transport	30,000	
Labor	6,000	14,250
Total costs	45,000	20,102
Tilapia		
Hire of smoking kiln	2,000	500
Firewood	1,875	4,600
Transport	9,000	6,200
Labour	4,000	10,000
Depreciation	120	281
Total costs	13,685	13,125

Source FIRRI survey data

3.3.2 Processors Outputs and Incomes

There was a sharp decline in quantities processed of Nile perch and Tilapia, representing a 86% drop in quantities processed. The price margins for Nile perch also decreased slightly in the same period while that of Tilapia improved slightly. Consequently, the profit levels of fish smoking enterprises declined drastically to the extent that Nile perch processors were earning net losses.

Table 3.10: Costs of Raw Fish and Revenues from Processed Fish by Species

	Smoking kilns	
	2003	**2002**
Nile perch		
Quantities processed	17.5	90.0
Buying price/ kg	1,700	600
Selling price/ kg	2,000	1,050
Cost of fish	93,500	50,750
Gross revenue	110,000	100,000

Net revenue	-28,500	29,148
Tilapia		
Quantities processed	21.5	152.0
Buying price/ kg	1,340	620
Selling price/ kg	1,800	990
Cost of fish	39,938	98,000
Gross revenue	60,188	166,800
Net revenue	6,565	55,675
Other species		
Quantities processed	36.3	
Buying price/ kg	700	
Selling price/ kg	1,300	

Source: FIRRI, survey data

3.4 Fish Marketing

3.4.1 Overview

There were approximately 60 bicycle traders, 6 pick-up traders and 4 boat traders. The main destinations of fresh tilapia and Nile perch are the processing factories in Kampala while processed forms are sold in Gulu.

Consumption Levels and Fish Prices

There was a decline in Nile perch consumption levels for consumers not involved in fishery activities. In addition, the price at which they bought Nile perch for home consumption more than doubled in the same period, an indication that the supply of immature Nile perch or factory rejects for home consumption at the beach is decreasing. The weekly per capita Tilapia consumption levels varied between 1.3kg and 2.2 kg, improving slightly from that of the previous year. The buying prices of Tilapia for home consumption increased for all categories of consumers, almost doubling for consumers not involved in fishery activities.

Table 3.11: Consumption Levels and Prices

	Consumers not involved in fishery activity		**Fish producers**		**Fish processors**		**Fish traders**	
	2003	2002	2003	2002	2003	2002	2003	2002
Nile perch								
Household size	8	4	7	9	9		.	14
Household consumption (kg)	2.2	1.6	2.0	1.9	1.8		.	4.0
Daily per capita consumption (kg)	.3	.5	.3	.2	.2		.	.3

Frequency of consumption (days/ wk)	4	3	6	3	5		.	4
Weekly per capita consumption (kg)	1.0	1.4	1.7	.8	.8		.	1.1
Price (Shs/ kg)	1,400	675	.	.	1,350		.	800
Weekly expenditure (shs)	9,667	2,700	.	.	7,750		.	12,800
Tilapia								
Household size	5	7	6	9	5	7	3	7
Household consumption (kg)	1.9	2.1	3.0	2.7	1.7	2.6	2.0	3.0
Daily per capita consumption (kg)	.4	.3	.6	.3	.4	.4	.7	.5
Frequency of consumption (days/ wk)	3	4	4	4	2	4	2	2
Weekly per capita consumption (kg)	1.3	1.1	2.2	1.1	.9	1.5	1.3	.8
Price (Shs/ kg)	1,067	617	833	675	1,333	675	800	750
Weekly expenditure (Shs)	5,100	3,192	9,667	9,500	5,400	7,163	3,200	4,650

Source FIRRI survey data

4. IREMERIA LANDING SITE

4.1 Background

Iremeria Landing Site, located in Kamuli District, was selected as the beach where no chilled transport facilities are expected throughout the project's life. During the monitoring survey of 2003, chilled transport facilities were not operating at the beach, however, bicycle traders delivered small catches of Nile perch to factory trucks stationed in the nearby trading center of Ndolwa. The population of the beach had increased from approximately 40 people in 2002 to 600 in 2003. Crop farming other than fishing was considered the main economic activity.

The number of landing sites in Kamuli District had been reduced from 29 to 25 following the BMU location guidelines in the new BMU statute.

During the monitoring survey, the number of trucks operating in the whole district had reduced from 14 to 12. It was reported that trucks purchased both Nile perch for fish factories and tilapia for the market in Rwanda. Trucks still operate at Ndolwa trading centre and the beaches of Kanganyaiza, Lugonyola, Iyingo, Bukungu and Nawampiti. Trucks had ceased operating at Kiribarya Landing Site.

Before the arrival of trucks in Kamuli, the price of a Kilogram of Nile perch was Shs 300/=, which rose to Shs 1,000 per Kg 2002 and at the time of the monitoring survey, it was costing an average of U.shs 1400/= (ranging between U.shs 1200/= to U.shs 1600/=)

In the financial year 2002/3, the district earned U. shs 5.28 million shillings as revenue from boat and specific licensing. The district plans to charge fish movement permits beginning this financial year (2003/4).

4.2 Fish Production

4.2.1 Overview

During the monitoring survey in 2003, it was reported that the number of fishers using mosquito seines, gill nets and longlines had increased (Table 4.1). Fishers had stopped using basket traps, boat seine and cast nets.

Table 4.1: Production Enterprises by Number at Iremeria for 2002 and 2003

Category of gear user	Year	
	2002	2003
	Number	Number
Mosquito netting	6	12
Gillnetting	4	10
Long lining	3	6
Basket trapping	2	-
Boat seining	2	-
Cast netting	1	-

Source: FIRRI, survey data

There was an increase in the number of fishing unit/boat owners and crews at Iremeria. The number of crews had reduced (Table 4.2). All boats at the beach were of the parachute type.

Table 4.2: Number by Category of Employment of People in Fishery Activities at Iremeria for 2002 and 2003

Category of employment	Year	
	2002	2003
	Number	Number
Crews	26	60
Fishing boat owners	14	25
Fishing unit renters	-	4
Bait suppliers	-	-
Carrying fish	-	-
Gear suppliers/makers	-	-
Fuel dealers	-	-
Firewood suppliers	-	-
Boat makers/repairs	-	2

Source: FIRRI, survey data

Tilapia was reported as the main fish species landed in 2003 as opposed to mukene in 2002. There was a significant decrease in estimated catches landed of mukene and Nile perch (Table 4.3).

Table 4.3: Estimated weekly quantities of catches landed at Iremeria for 2002 and 2003

Species	**Year**	
	2002	**2003**
	Wt (Kgs)	**Wt (Kgs)**
Nile perch	500	140
Tilapia	150	840
Mukene	750	320
Protopterus	40	70

Source: FIRRI, survey data

4.2.2 Fishing Inputs and Costs

The investment costs of longline fishing units dropped sharply due to reduced investments made on hooks. For the Mukene fishers, there were slight changes in the investment levels of their enterprises.

Table 4.4: Average weekly production costs by type of gears.

	Gear type					
	Longline		**Mosquito seine**		**Gill nets**	
	2002	2003	2002	2003	2002	2003
Nile perch						
Boat	8,000	.	.	.		.
Gear	100,000	19,500	.	.		.
Investment costs	108,000	19,500	.	.		.
Tilapia						
Boat	.	.	.	.		96,667
Gear	.	.	.	.		141,667
Investment costs	.	.	.	.		238,333
Mukene						
Boat	.	.	156,000	149,200		.
Gear	.	.	212,000	168,300		.
Pressure lamp	.	.	90,000	116,600		.
Investment costs	.	.	458,000	434,100		.

Source FIRRI survey data

The costs of fishing of longline fishing enterprises were higher due to increased expenditure on labour while that of Mukene fishers changed slightly.

Table 4.5: Average weekly operating costs by type of gears

	Gear type			
	Longline		**Mosquito seine**	
	2002	2003	2002	2003
Nile perch				
Boat hire	.	6,000	.	.
Labour	15,000	25,000	.	.
Total costs	15,000	31,000	.	.
Mukene				
Boat hire	.	.	.	.
Paraffin	.	.	9,820	35,200
Labour	.	.	6,989	17,600
Total costs	.	.	16,809	52,800

Source FIRRI survey data

4.2.3 Fish Producers Outputs and Incomes

The catch rates of longline fishing units targeting Nile perch almost doubled while prices increased from 1,000 to 1,500 Ug. Shs, representing a 50% increase. Consequently, their gross and net incomes increased significantly. Mukene fishers earned lower net incomes mainly due to increased costs.

Table 4.6: Average Weekly Catches and Incomes of Fishers by Type of Enterprise

	Gear type			
	Longline		**Mosquito seine**	
	2002	2003	2002	2003
Nile perch				
Quantities landed	37.5	66.7	.	.
Price/ kg	1,000	1,500	.	.
Gross revenue	37,500	100,000	.	.
Net revenue	22,500	69,000	.	.
Mukene				
Quantities landed	.	.	70.2	71.6
Price/ kg	.	.	630	700

Gross revenue	.	.	48,359	51,340
Net revenue	.	.	31,550	-1,460
Other species				
Quantities landed	.	.	50.0	.
Price/ kg	.	.	250	.

Source FIRRI survey data

4.3 Fish Processing

4.3.1 Overview

The number of processors engaged in sun drying of mukene had increased from 6 in 2002 to 12 in 2003 and 1 processor was engaged in smoking tilapia. All processors at Iremeria own boats and therefore process their own catches.

4.4 Fish Marketing

4.4.1 Overview

The access road to Iremeria is still poor. Coupled with poor catches, the landing site could attract neither factory truck traders nor boat traders. It was reported that the number of bicycle traders had increased from 2 to 4. The bicycle traders deliver both fresh Nile perch and tilapia to Ndolwa Trading Centre for factory agents while wholesale traders take processed mukene to Palisa.

4.5 Fish Consumption

The weekly per capita consumption levels of Nile perch increased among the fish consumers not involved in fishery activities. However, the consumer buying prices double, thus increasing the expenditure on Nile perch for consumption. Likewise, the consumption levels and consumer prices of Tilapia increased.

Table4.7: Consumption Levels and Prices

	Consumers not involved in fishery activity		**Fish producers**	
	2003	**2002**	**2003**	**2002**
Nile perch				
Household size	4	11	.	
Household consumption (kg)	2.0	1.8	.	
Daily per capita consumption (kg)	.5	.3	.	
Frequency of consumption (days/ wk)	3	1	.	
Weekly per capita consumption (kg)	1.5	.3	.	
Price (Shs/ kg)	1,500	750	.	

Weekly expenditure (Shs)	9,000	1,375	.	
Tilapia				
Household size	7	7	9	9
Household consumption (kg)	3.5	2.0	2.3	2.0
Daily per capita consumption (kg)	.6	.3	.3	.2
Frequency of consumption (days/ wk)	7	2	4	3
Weekly per capita consumption (kg)	3.6	.5	1.0	.5
Price (Shs/ kg)	700	757	1,500	600
Weekly expenditure (Shs)	12,600	2,843	12,500	3,060

Source FIRRI survey data

5. KABOLWA LANDING SITE

5.1 Background

In the survey of 2002, Kabolwa Landing, located in Masindi District, was selected as a beach where chilled transport facilities already operate. During the time of the monitoring survey, it was reported that factory trucks had ceased operating at the beach in August 2002. This was attributed to the poor access road to the beach and decline in Nile perch catches landed. Therefore, Nile perch catches landed were delivered to Songa Lendu by boat or bicycle traders, a nearby beach where factory trucks were still present. The population of the beach rose from approximately 1430 people in 2002 to 1800 people in 2000.

The district still had a total of 18 beaches on Lake Albert and River Nile, however, during the monitoring survey, it was reported that a District Council resolution had been passed to reduce the number of beaches on Lake Albert in Masindi from 10 to 7 following the guidelines on BMU location in the new statute. It was also envisaged that this would ease fisheries management and monitoring and provision of services such as health, education, water and sanitation. The three beach communities were to be relocated to the 7 beaches of Butiaba, Walukuba, Bugoigo, Kabolwa, Katala, Karakaba and Wanseko. The number of fishers in the district had increased from 2,655 to approximately 3,000 while the number of boats had increased from 885 to approximately 1,200 in the district. This was attributed to an influx of fishers from Lake Victoria, West Nile and DRC to beaches in Masindi District where there was ready market for Nile perch. The influx of fishing effort to the district was also associated with improvements in the level of motorisation.

Although a lesser quantity of Nile perch was landed in 2002 than 2001, it fetched a higher value due to increase in prices per kilogram attributed to the presence of factory trucks (Table 5.1). The reduction in Nile perch catches landed was attributed to suspected decline in stocks, however, this is subject to stock assessment study.

Table 5.1: Estimated Fish Catches for Masindi District by Species, Weight and Value for 2002 and 2003

Species	**Year**			
	2001		**2002**	
	Weight (metric tons)	**Value** (U. Shs)	**Weight** (metric tons)	**Value** (U. Shs)
Nile perch	802.4	819,467	578.2	1,038,240
Tilapia	559.1	652,986	467.5	931,540
Bagrus bayad	443.7	386,828	290.2	445,255
Bagrus docmac	8.5	6,495	3.2	4,290
Hydrocynus forskhlii	369.3	335,199	493.8	601598
Hydrocynus vittatus	8.5	8,011	13.6	22,755
Auchemoglanis	16.2	11,611	47.0	64,200
Distichodus	16.3	13,853	35.4	53,990
Laboe horie	5.7	4,898	8.5	13,050
Laboe coubie	1.9	1,300	3.3	4,950
Momyrus	2.1	1,533	18.9	22,736
Alestes baremose	179.6	204,492	441.6	795,464
Brycinus nurse	19.2	6,720	32.5	17,366
Clarias	5.3	4,295	8.3	13,215
Protopterus	7.3	12,133	4.2	5,210
Synodontis	-	-	16.2	25,820
Mallapt. Electrical	-	-	3.9	4,167
Total	**2,445.1**	**2,469,921**	**2,466.3**	**4,063,846**

Source: Masindi District records

During the monitoring survey, it was reported that the number of trucks had increased from 8 to 20. Trucks operate at the beaches of Butiaba (9 trucks), Bugoigo (3 trucks), Wanseko (6 trucks), Songa Lendu (1 truck) and Walukuba (1 truck) and on average load approximately 3 tons per week. The trucks are privately owned by agents and deliver fish to any factory in Kampala that offers a

better price. It was also reported that approximately 20 boat traders were delivering fish from Hoima and DRC to beaches with factory trucks in Masindi.

Before the arrival of chilled transport facilities, the price of a kilogram of Nile perch was Shs 500/=, which rose to Shs. 1,200/= per kg and in 2003 a kilogram was selling at an average of U.shs 1500/= and U. shs 1000/= at beaches with and without trucks respectively.

The district levied specific licence worth U.shs 2.6 million from the 20 trucks in the financial year 2002/3 and also realised an increase in fishing vessel licence from U. shs 4 million in 2001/2 to 6 million in 2003/3. The district also begun charging fish movement permits from the factory trucks in April 2002 and by the end of the financial year in June had realised U. shs 4.6 million. In the month of August 2003, the district collected U. shs 4.15 million from fish movement permits at the beaches of Butiaba (2.3 million), Bugoigo (1.2 million) and Wanseko (650,000). Fish movement permit is U. shs 10/= and U. shs 20/= per kilogram for fresh and processed fish respectively.

Raising prices coupled with available market had continued to benefit fishers and tremendously raised their incomes. However, the local fishers have complained about the stiff competition from new competitors coming from Lake Victoria who joined the fishery with better fishing equipment. Some local fishers have become employees of the 'outsiders'. The livelihoods of local fishers have also been further affected by the numerous operations undertaken by the contract staff together with the District Fisheries Offices against undersized nets (recommended mesh size is 4 inches and above). The operations led to confiscation and burning of many gillnets that were targeting Hydrocynus and Alestes baremose. The two species are easily caught with nets of mesh sizes that are less than 4 inches.

It was reported that the district was all out to support the operations of chilled transport facilities. For instance, as a way of improving sanitation at beaches, a new latrine had been constructed and plans were under way to fence of the weighing slab and supply water with funds from Local Government Development Project (LGDP) at Wanseko. The access roads to Kabolwa and Butiaba had been graded and there was hope that trucks would resume their operations at Kabolwa. There are plans to extend gravity water from Butiaba to Walukuba in this financial year. Butiaba is to benefit from African Development Bank (ADB) funded project of U. shs 1.8 billion to construct infrastructure and fish handling facilities. It was also reported that two staff facilitated with two motorcycles, had been deployed to the sub counties of Bullisa and Bisso to boost fisheries management, data and revenue collection. The district had also undertaken a sensitisation programme in preparation for the establishment of BMUs and was only waiting for the election date to be set by DFR, Entebbe. There is hope that BMUs will work together with fisheries staff to co-manage the fisheries.

5.2 Fish Production Sub-sector

5.2.1 Overview

In 2002, gillnetting was reported to be the major fishery at Kabolwa, however, due to the operations against illegal gear use, many gillnets that were below the recommended mesh size of 4 inches were burnt and therefore during the monitoring survey it was established that most fishers had switched to *Kaganga* to target Brycinus nurse (Table 5.2). Some fishers were also using mosquito nets to target mukene (Neobola bredoi).

Table 5.2: Production Enterprises by Number at Kabolwa for 2002 and 2003

Category of gear user	**Year**	
	2002	**2003**
	Number	**Number**
Gill netting	100	20
Kaganga	70	37
Long lining	35	20
Mosquito nets/pressure lamps	-	3

Source: FIRRI, survey data

There was an increase in the number of fishing unit/boat owners and crews. The number of renters had reduced (Table 5.3). The number of trading boats with outboard engines had reduced from 4 to 2. The boats owned were mainly Congo Barike type.

Table 5.3: Number by Category of Employment of People in Fishery Activities at Kabolwa for 2002 and 2003

Category of employment	**Year**	
	2002	**2003**
	Number	**Number**
Crews	140	240
Fishing boat owners	70	60

Fishing unit renters	30	20
Bait suppliers	-	-
Carrying fish	-	20
Gear suppliers/makers	-	2
Fuel dealers	-	-
Firewood suppliers	-	1
Boat makers/repairs	-	1

Source: FIRRI, survey data

In 2002, it was reported that the main fish species landed was *Hydrocynus* Spp (estimates of the year were not given) but got superseded by Brycinus nurse as per the estimated weekly catches landed (Table 5.4). This was attributed to the enforcement of the legal minimum on gill nets.

Table 5.4: Estimated Weekly Quantities Catches Landed At Kabolwa 2003

Species	**Wt** (Kgs)
Nile perch	350
Tilapia	560
Mukene	350
Hydrocynus	280
Brycinus nurse	6300

Source: FIRRI, survey data

5.2.2 Fishing inputs and Costs

The investment costs for longline and gill net fishing units targeting Nile perch decreased by approximately 75% and 66% respectively. The decline in investments costs was mainly attributed the decreased investments on hooks and gill nets. In contrast, owners of gill net fishing units targeting Tilapia increased their investments especially on gill nets by about 146% over the same period. The investment requirements for fishers catching *Brycinus nurse* were relatively very low, requiring about 20,000 Shs/ unit.

Table 5.5: Fishing Inputs and Investment Costs

	Gear type					
	Longline		Gill net		Kaganga	
	2002	2003	2002	2003	2002	2003
Nile perch						
Boat	92,000	120,000	122,000	120,000	.	.
Gear	607,143	52,900	482,000	325,000	.	.
Investment costs	699,143	172,900	604,000	445,000	.	.
Tilapia						
Boat	.	.	95,000	120,000	.	.
Gear	.	.	53,000	324,000	.	.
Investment costs	.	.	148,000	364,000	.	.
Brycinus nurse						
Boat	.	.	.	.	.	85,000
Gear	.	.	.	.	12,750	5,350
Investment costs	.	.	.	.	12,750	19,517
Other species						
Boat	75,000	.	86,364	115,000	.	.
Gear	90,000	25,000	174,792	470,000	.	.
Investment costs	165,000	25,000	253,958	585,000	.	.

Source FIRRI survey data

5.2.3 Other costs

The costs of fishing for Nile perch targeting enterprises declined due to reduced expenditure on labour costs. Given that labour costs are directly related to gross revenues, a decline in labour costs is an indication that gross revenues had declined. On the other hand, Tilapia fishing units incurred higher labour costs mainly due to increased expenditure on labour. The change in the operating costs for fishers targeting *Brycinus nurse* was relatively small.

Table 5.6: Average Weekly Production Costs

	Gear type					
	Longline		Gill nets		Kaganga	
	2002	2003	2002	2003	2002	2003
Nile perch						
Boat hire	.	.	.	.	.	.
Labour	42,824	39,150	96,665	38,065	.	.
Total costs	42,824	39,150	96,665	38,065	.	.
Boat hire	.	.	.	2,500	.	.

Labour	.	.	6,139	22,206	.	.
Total costs	.	.	6,139	23,872	.	.
Brycinus						
Boat hire	.	.	.	.	31,875	3,625
Flour	.	.	.	.	.	9,100
Labour	.	.	.	.	23,750	9,116
Total costs	.	.	.	.	55,625	19,116
Other species						
Boat hire	.	6,000	50,000	.	.	.
Labour	9,268	6,000	10,790	71,200	.	.
Total costs	9,268	12,000	14,956	71,200	.	.

Source FIRRI survey data

5.2.4 Earnings of Production Enterprises

The catch rates of gill net fishing units targeting Nile perch had declined considerably by approximately 68% while that of longlines changed slightly. The average prices of Nile perch had dropped from 1,000 to 940 Ug. Shs/ kg or by 8%. Consequently, the net incomes of Nile perch targeting enterprises declined. In contrast, the catch rates of Tilapia enterprises increased by almost 87% while prices increased from 480 to 780 Ug. Shs/ kg and thus the net incomes of Tilapia targeting enterprises improved significantly. For Brycinus nurse enterprises, the catch rates had declined by almost 67% while prices improved slightly from 250 to 280 Ug. Shs/ kg and thus their net incomes had decreased.

Table 5.7: Average Weekly Catches and Incomes of Fishers by Species

	Gear type					
	Longline		**Gill nets**		**Kaganga**	
	2002	2003	2002	2003	2002	2003
Nile perch						
Quantities landed	86	87	218	69	.	.
Price/ kg	1,086	900	940	975	.	.
Gross revenue	95,615	81,500	209,150	95,846	.	.
Net revenue	52,792	42,350	112,485	57,781	.	.
Tilapia						
Quantities landed	.	.	29.8	55.6	.	.
Price/ kg	.	.	475	780	.	.
Gross revenue	.	.	14,456	50,833	.	.
Net revenue	.	.	8,318	26,961	.	.
Brycinus nurse						
Quantities landed	.	.	.	.	357.5	119.3
Price/ kg	.	.	.	.	250	287
Gross revenue	.	.	.	.	89,375	32,827

Net revenue	.	.	.	.	33,750	13,711
Other species						
Quantities landed	33.1	60.0	62.9	166.7	.	.
Price/ kg	700	400	446	1,100	.	.
Gross revenue	23,170	24,000	26,306	178,000	.	.
Net revenue	13,902	12,000	11,350	106,800	.	.

Source FIRRI survey data

5.3 Fish Processing Sub-sector

5.3.1 Overview

Sun-drying of *Brycinus nurse* and mukene (*Neobola Bredoi*) is still the main fish processing method with approximately 50 people engaged in it. The number of processors engaged in smoking reduced from 30 to 15 (and 15 smoking kilns) and 3 processors and the number of processors engaged in salting were 3.

5.3.2 Input and costs

The changes in the investments costs of fish smokers reflect the fact that smoking kilns are not standard and therefore vary in cost depending on the nature and quantities of materials used.

Table 5.8: Inputs Costs and Investment Costs

	Smoking kilns		**Drying racks**	
	2003	**2002**	**2003**	**2002**
Tilapia				
Cost of drying rack	.		28,000	
Investment costs	.		28,000	
Other species				
Cost of smoking kiln	5,000	14,200	.	
Cost of wire mesh	6,000	28,900	.	
Investment costs	11,000	43,100.	.	

Source: FIRRI, survey data

5.3.2. Input Costs of Processing Units.

The processing costs for processors who salted/ sun dried Tilapia had increased substantially mainly due to increments in the costs of transport. Similarly, the costs of smoking other species such as Bagrus bayad had also increased.

Table 5.9: Weekly Input Costs of Processing Units

	Smoking kiln		Drying rack		Bare ground	
	2003	**2002**	**2003**	**2002**	**2003**	**2002**
Tilapia						
Salt	.		16,750	10,000	.	
Transport	.		137,500	60,000	.	
Labour	.		31,875	30,000	.	
Depreciation	.		140		.	
Total costs	.		186,265	100,000	.	
Brycinus nurse						
Labour	.		.		2,000	
Total costs	.		.		2,000	
Other species* **						
Hire of smoking kiln	3,750		.		.	
Firewood	6,000	2,833	.		.	
Labour	3,900	18,167.	.		.	
Depreciation	150	171	.		.	
Total costs	11,850	21,143.	.		.	

Source: FIRRI, survey data

5.3.3 Processors Outputs and Incomes

Processing of Nile perch was still very limited as indicated by the absence of Nile perch processors in the sample. Main fish species processed included *Hydrocynus, Alestes baremose* and *Bagrus bayad.*

Table 5.10 Average weekly Cost of Raw Fish and Revenues

	Smoking kiln		Drying rack		Bare ground	
	2003	**2002**	**2003**	**2002**	**2003**	**2002**
Tilapia						
Quantities processed	.		500.0		.	
Buying price/ kg	.		850		.	
Selling price/ kg	.		1,400		.	
Cost of fish	.		387,500		.	
Gross revenue	.		600,000		.	
Net revenue	.		26,235		.	
Brycinus nurse						
Quantities processed	.		.		78.4	
Buying price/ kg	.		.		140	
Selling price/ kg	.		.		200	
Cost of fish	.		.		11,256	
Gross revenue	.		.		15,680	
Net revenue	.		.		2,424	

Other species						
Quantities processed	70.5	125.0	.		50.0	
Buying price/ kg	800	383	.		1,000	
Selling price/ kg	1,100	867	.		1,300	
Cost of fish	52,950	48,667	.		.	
Gross revenue	74,100	111,667	.		.	
Net revenue	9,300	41,857	.		.	

Source: FIRRI, survey data

5.4 Fish Marketing Sub-sector

5.4.1 Overview

Fish marketing at Kabolwa Landing Site had been affected by a poor access road constraining the movement of factory trucks, which abandoned the beach in August 2002. However, at the time of the monitoring survey, the road had just been graded and there was hope that factory tucks would resume operating at the beach. Boat or bicycle traders deliver much of the Nile perch landed at Kabolwa to factory trucks at Songa Lendu.

Table 5.11: Number by category of trader Kabolwa for 2002 and 2003

Category of processors	**Year**	
	2002	**2003**
	Number	**Number**
Bicycle trader	3	3
Truck trader	4	-
Boat Trader	-	2

Source: FIRRI, survey data

5.5 Consumption Levels and Prices

A few households that mainly consumed Nile perch still existed with average weekly consumption levels varying between 1-3.4 kg while the prices ranged between 950-1000 Ug. Shs/ kg. The weekly per capita consumption levels of Tilapia had declined, previously ranging between 2.2-2.8 kg and now at 1.1-1.6 kg while the prices increased from 650 to 950 Ug. Shs/ kg.

Table 5.12: Consumption Levels and Prices

	Consumers not involved in fishery activity		Fish producers		Fish processors	
	2003	**2002**	**2003**	**2002**	**2003**	**2002**
Nile perch						
Household size	4		11	6	6	9
Household consumption (Kg)	2.8		2.2	1.9	2.0	3.0
Daily per capita consumption (Kg)	.7		.2	.4	.3	.3
Frequency of consumption (days/ wk)	5		4	5	7	7
Weekly per capita consumption (Kg)	3.4		1.0	1.9	2.3	2.3
Price (Shs/ kg)	950		933	1,000	1,000	.
Weekly expenditure	13,900		9,933	8,125	14,000	.
Tilapia						
Household size	5	5	6	9	6	6
Household consumption (Kg)	1.7	2.2	2.0	5.2	1.9	2.3
Daily per capita consumption (Kg)	.3	.5	.3	.6	.4	.6
Frequency of consumption (days/ wk)	4	4	4	4	3	4
Weekly per capita consumption (Kg)	1.1	2.2	1.6	2.0	1.0	2.8
Price (Shs/ kg)	908	683	950	683	929	608
Weekly expenditure (Shs)	5,160	4,292	6,458	9,683	5,189	5,617
Other species						
Household size	7	6	4	9	.	
Household consumption (Kg)	3.0	1.9	2.0	2.7	.	
Daily per capita consumption (Kg)	.4	.4	1.2	.3	.	
Frequency of consumption (days/ wk)	7	5	7	5	.	
Weekly per capita consumption (Kg)	3.0	1.9	7.2	1.6	.	
Price (Shs/ kg)	600	1,000	.	680	.	
Weekly expenditure (Shs)	12,600	8,125	.	6,500	.	

Source FIRRI survey data

6. SOMSIO LANDING SITE

6.1 Background

During the survey of 2002, Somsio Landing Site, located in Masindi, was selected as the landing site where no chilled transport facilities are expected throughout project's life. The population of the beach increased from approximately 150 people in 2002 to 200 people in 2003.

6.2 Fish Production Sub-sector

6.2.1 Overview

In 2002, gillnetting was reported to be the major fishery, however, due to the operations against illegal gear use, many gillnets that were below the recommended mesh size of 4 inches were burnt and therefore most fishers switched to longlining (Table 6.1). Some fishers were also using mosquito nets to target mukene (*N. bredoi*) and Kaganga to target *Brycinus nurse*.

Table 6.1: Production Enterprises by Number at Somsio for 2002 and 2003

Category of gear user	Year	
	2002	2003
	Number	Number
Gill netting	22	3
Kaganga	7	3
Long lining	-	14
Mosquito nets/pressure lamps	-	4
Boat seining	2	-

Source: FIRRI, survey data

There was a decrease in the number of fishing unit/boat owners, renters and crews (Table 6.2). All boats were nearly owner operated and were of Congo Barque type.

Table 6.2: Number by Category of Employment of People in Fishery Activities at Somsio for 2002 and 2003

Category of employment	Year	
	2002	2003
	Number	Number
Crews	60	50
Fishing boat owners	27	17
Fishing unit renters	-	7
Bait suppliers	-	4
Carrying fish	-	-
Gear suppliers/makers	-	-
Fuel dealers	-	-
Firewood suppliers	-	7
Boat makers/repairs	-	-

Source: FIRRI, survey data

Quantities of fish catches landed had reduced in 2003. This was attributed to the loss of gears as a result of operations against illegal gear use. Fishers had ceased targeting some species such as *Alestes baremose* and *Hydrocynus* that required using nets of mesh sizes that are less than 4 inches. During both surveys (2002/3), it was reported that the main fish species landed was Brycinus nurse as per the estimated weekly catches landed (Table 6.3). Some fishers were targeting mukene.

Table 6.3: Estimated Weekly Quantities Catches Landed at Somsio in 2002 and 2003

Fish species	Year	
	2002	2003
	Wt (kg)	Wt (kg)
Brycinus nurse	4,000	840
Alestes baremose	3,200	-
Hydrocynus	800	-
Nile perch	200	350

Mukene	-	700

Source: FIRRI, survey data

6.2.2 Inputs and Costs

The investment levels of Nile perch targeting enterprises had increased, rising by 53% for longline and 17% for gill netting enterprises.

Table 6.4 Average weekly production costs by type of gears

	Gear type			
	Longline		Gill nets	
	2002	2003	2002	2003
Nile perch				
Boat	80,000	155,214	225,000	123,333
Gear	30,000	32,750	134,000	295,733
Investment costs	110,000	168,563	359,000	419,067
Tilapia				
Boat	.	.	180,000	.
Gear	.	.	91,800	.
Investment costs	.	.	271,800	.
Other species				
Boat	.	.	99,250	.
Gear	.	.	171,100	.
Investment costs	.	.	270,350	.

Source FIRRI survey data

6.2.3 Operating Costs

Owners of fishing enterprises generally incurred higher fishing costs due to increments in the costs of labour and bait for longline fishing enterprises.

Table 6.5: Average Weekly operating Costs

	Gear type			
	Longline		Gill nets	
	2002	2003	2002	2003
Nile perch				
Boat hire	.	3,600	.	.

Labour	14,195	29,690	151,888	58,433
Total costs	14,195	30,140	151,888	58,433
Tilapia				
Boat hire	.	.	.	.
Labour	.	.	22,800	.
Total costs	.	.	22,800	.
Other species				
Boat hire	.	.	.	.
Labour	.	.	54,680	.
Total costs	.	.	54,680	.

Source FIRRI survey data

6.2.4 Earnings of Production Enterprises

The catch rates of Nile perch targeting enterprises generally decreased while average prices increased from Ug.shs 700 – 1150/kg. Consquantly Nile perch targeting enterprises using gill nets realized reduced net incomes.

Table 6.6: Average Weekly Catches and Incomes of Fishers

	Gear type			
	Longline		Gill net	
	2002	2003	2002	2003
Nile perch				
Quantities landed	52.6	68.1	358.6	119.4
Price/ kg	600	1,063	800	1,167
Gross revenue	31,545	70,625	379,721	143,333
Net revenue	17,350	40,485	227,832	84,900
Tilapia				
Quantities landed	.	.	71.3	.
Price/ kg	.	.	800	.
Gross revenue	.	.	57,000	.
Net revenue	.	.	34,200	.

Source FIRRI survey data

6.3 Fish Processing Sub-sector

6.3.1 Overview

Sun-drying of mukene and *Brycinus nurse* was the only fish processing method with approximately 34 people involved in it. Smoking fish had ceased by 2003 due to lack of supplies of *Hydrocynus* and *Alestes baremose*.

6.4 Fish Marketing Sub-sector

6.4.1 Overview

During the monitoring survey, it was reported that boat or bicycle traders delivered Nile perch landed at Somsio to factory trucks at Walukuba while the sundried mukene and Brycinus nurse was bought by 5 traders coming from Gulu.

6.5 Fish Consumption

The weekly per capita consumption levels of Nile perch had declined, varying between 1.3-1.8 kg as compared to 1.8-1.4 kg in the previous year. The consumption levels of Tilapia remained relatively the same while consumer prices slightly declined. Consumers of other species were spending between 1000-1500 Ug. Shs/ kg, slightly higher than the consumer prices of Nile perch and Tilapia.

Table 6.7: Consumption Levels and Prices

	Consumers not involved in fishery activity		Fish producers		Fish processors		Fish traders	
	2003	2002	2003	2002	2003	2002	2003	2002
Nile perch								
Household size	5	2	8	9	.		4	
Household consumption (kg)	2.0	.8	2.7	3.8	.		1.0	
Daily per capita consumption (kg)	.4	.6	.4	.4	.		.3	
Frequency of consumption (days/ wk)	3	6	3	4	.		7	
Weekly per capita consumption (kg)	1.3	4.1	1.2	1.8	.		1.8	
Price (Shs/ kg)	1,033	.	.		.		1,100	
Weekly expenditure (kg)	7,400	.	.		.		7,700	
Tilapia								
Household size	7	7	.	9	.		.	
Household consumption (kg)	1.5	1.8	.	3.0	.		.	
Daily per capita consumption (kg)	.2	.3	.	.3	.		.	
Frequency of consumption (days/	3	2	.	4	.		.	

wk)								
Weekly per capita consumption (kg)	.6	.6	.	1.4	.		.	
Price (Shs/ kg)	800	1,050	.	.	.		.	
Weekly expenditure (shs)	3,600	4,050	.	.	.		.	
Other species								
Household size	6	5	.	9	6	9	2	
Household consumption (kg)	2.3	1.0	.	2.3	2.0	3.3	.5	
Daily per capita consumption (kg)	.4	.2	.	.3	.3	1.5	.3	
Frequency of consumption (days/ wk)	3	6	.	4	7	3	2	
Weekly per capita consumption (kg)	1.0	1.2	.	.9	2.3	2.5	.5	
Price (Shs/ kg)	1,233	1,000	.	.	1,500	1,000	1,000	
Weekly expenditure (Shs)	7,967	6,000	.	.	21,000	11,550	1,000	

Source FIRRI survey data

7. RUNGA LANDING SITE

7.1 Background

In the survey of 2002, Bikunyu was selected as the landing site where chilled transport facilities had not reached but were expected during the lifetime of the project. During the monitoring survey in 2003, it was reported that officers from DFR, Entebbe, had closed Bikunyu Landing Site in October 2002. The landing site was closed because of the rampant use of illegal gears such as undersized mesh nets and seine nets. The community was given three months (1st January to 31st March 2003) to relocate to the nearby landing site of Runga with hope that reduction in number of landing sites would improve fisheries management and monitoring in the district. Bikunyu was therefore substituted with Runga Landing Site, which is also found in Hoima. It was also considered a suitable substitute since the Bikunyu community had relocated there.

Chilled transport facilities arrived in Hoima District in August 2001 and there were 7 parked at trading centres of Buseruka (2 trucks), Kaseta (one truck), Kyangwali (2 trucks) and nearest accessible point to Runga Landing Site (3 trucks). During the monitoring survey there were no factory trucks operating at Runga. There were only 2 trucks operating in Hoima District at Kaseta and Buseruka. However, approximately 20 boats deliver Nile perch to Butiaba Landing Site in Masindi District. The reduction in number of trucks was attributed to reduction in catches landed of Nile perch due to loss of fishing gear as a result of operations against illegal gear use and the poor access roads in the District compared to Masindi.

The population of Runga Landing Site is approximately 1000 people. The main economic activities at the beach are fishing and animal keeping.

The number of beaches in the whole district was reduced from 28 to 15 following the guidelines on BMU location. There was hope to improve fisheries management and delivery of social services as a result of reduction in number of beaches.

The district was not charging specific licence from the few remaining trucks and boats as an incentive for the enterprise heads to remain operating in the district since they were offering better prices to fishers for Nile perch than before. For instance, before the arrival of chilled transport facilities, the price of a Kilogram of Nile perch was Shs 250, however, it increased to Shs 1,100 per Kg in 2002 and at the time of the monitoring survey a kilogram was costing U. shs 1350/=.

In the financial year 2002/3, with funding from PAF, slabs were constructed at Tonya, Hoimo, Waki, Nyawaiga and Kyenyanja Landing Sites to improve fish handling. It was reported that there were plans to tarmac the 14-kilometre stretch from Buseruka to Tonya to improve on the accessibility of beaches on the lower side of the escarpment using funds from IFAD. It was also reported that Tonya Landing Site would further benefit from an ADB funded Investment of

U.Shs 300 million to improve fish handling facilities and infrastructure at the beach.

It was further reported that local fishers have continued to complain against the stiff competition from new competitors from Lake Victoria who joined the fishery with better fishing equipment. There was a rise in cases of theft of gear prompting new fishers from Lake Victoria to employ private security personnel to guard their nets on the Lake. The district authorities responded by holding a series of meetings to resolve the rivalry between the local and new fishers.

7.2 Fish Production Sub-sector

7.2.1 Overview

The main type of fishery at Runga is gillnetting followed by longlining, mosquito seining and *Kaganga*.

Table 7.1: Production Enterprises by Number at Runga 2003

Category of gear user	Number
Gill nets	70
Long lining	60
Mosquito seining	30
Kaganga	5

Source: Survey data

There were approximately 160 fishing boat owners (150 are Congo Barque while 10 are Ssese), 50 boat renters and 480 crewmembers. Boats were operated either by the owner or renter with 3 crewmembers. There were 2 trading boats with outboard engines.

Table 7.2: Number by Category of Employment of People in Fishery Activities at Runga for 2003

Category of employment	Number
Crews	480
Fishing boat owners	160
Fishing unit renters	50

Bait suppliers	-
Carrying fish	7
Gear suppliers/makers	4
Fuel dealers	-
Firewood suppliers	80 (small scale)
Boat makers/repairs	6

Source: FIRRI, survey data

At the time of the monitoring survey, the main fish species landed was *Synodontis*. However, S*ynodontis* catches vary according to seasons. This was followed by *Bagrus*, Nile perch, mukene, tilapia, *Brycinus nurse*, *Alestes baremose* and *Barbus* (Table 7.3).

Table 7.3: Estimated weekly quantities catches landed at Runga 2003

Fish species	**Wt (Kgs)**
Synodontis	3500
Bagrus	1050
Nile perch	700
Mukene	280
Tilapia	210
Brycinus nurse	210
Alestes Baremose	140
Barbus	70

Source: FIRRI, survey data

7.2.2 Fishing Inputs and Costs

Longlining was the main type of gear used for targeting Nile perch. There were increased investments in both longlining and gillnetting probably attributed to the operations against illegal gear use especially under mesh sized nets (less than 4 inches).

Table 7.4: Average Fishing Inputs and Investment Costs

	Gear type			
	Longline		Gill nets	
	2002	2003	2002	2003
Nile perch				
Boat	90,000	195,250	98,333	155,500
Gear	72,400	90,000	110,500	540,000
Investment costs	162,400	285,250	159,667	695,500
Tilapia		.		.
Boat	.	.	73,800	.
Gear	.	.	117,167	.
Investment costs	.	.	178,667	.
Other species		**.**		**.**
Boat		.		160,000
Gear		.		726,267
Investment costs		.		886,267

Source FIRRI survey data

7.2.3 Other Costs

Most boats are owner operated, few fish producers hired boats. There was an increase in total costs for fishing due to an increase in the labour cost for both longliners and gill-netters. This could be as a result of increase in revenue since labour for crewmember is usually calculated as a percentage of either gross or net revenues. New fishing unit owners coming from Lake Victoria and DRC mainly targeting Nile perch have offered employment opportunities to crews.

7.5: Average Weekly Production Costs

	Gear type			
	Longline		Gill nets	
	2002	2003	2002	2003
Nile perch		.		.
Boat hire	.	58,688	31,667	37,800
Labour	26,873	58,688	31,329	37,800
Total costs	26,873	.	47,162	.
Tilapia		.		.
Boat hire	.	.	18,750	.

Labour	.	.	18,853	.
Total costs	.	.	21,978	.
Other species		.		.
Boat hire	.	.	15,000	.
Labour	.	.	6,055	43,342
Total costs	.	.	15,055	43,342

Source FIRRI survey data

7.2.4 Earnings of Production Enterprises

There were modest improvements in the catch rates of Nile perch while average prices increased from Ug. Shs 730 to 1000/kg. Consequently, fishers targeting Nile perch realized higher net incomes.

Table 7.6: Average Weekly Catches and Incomes of Fishers by Species

	Gear type			
	Longline		**Gill nets**	
Nile perch				
Quantities landed	106.4	120.0	102.5	109.6
Price/ kg	650	950	692	1,167
Gross revenue	69,995	117,375	86,689	126,000
Net revenue	43,123	58,688	39,527	88,200
Tilapia				
Quantities landed	.	.	96.4	.
Price/ kg	.	.	629	.
Gross revenue	.	.	54,638	.
Net revenue	.	.	32,660	.
Other species				
Quantities landed	.	.	30.8	115
Price/ kg	.	.	560	840
Gross revenue	.	.	18,274	121,678
Net revenue	.	.	3,219	78,336

Source FIRRI survey data

7.3 Fish Processing

7.3.1 Overview

Sun drying was the main fish processing method with approximately 80 processors followed by salting and smoking with approximately 50 and 30 processors respectively. There were 15 smoking kilns, 25 drying racks and several drying grounds in Runga.

7.3.2 Input and Costs

There are higher investment costs for smoking kilns than pits attributed to purchase of wire meshes that keeping getting worn out in smoking kilns.

Table 7.7: Input and Investments Costs

	Smoking kilns		Smoking pits	
	2003	**2002**	**2003**	**2002**
Nile perch				
Cost of smoking kiln	8,500		3,000	
Cost of wire mesh	22,000		9,600	
Investment costs	19,500		6,300	
Others species				
Cost of smoking kiln	40,000		3,500	
Cost of wire mesh	.		5,000	
Investment costs	40,000		4,000	

Source: FIRRI, survey data

There were high total costs for both processors with smoking kilns and pits attributed to high firewood and labour costs.

Table 7.8: Average Weekly Operating Costs of Processing Units

	Smoking kilns		Smoking pits	
	2003	**2002**	**2003**	**2002**

Nile perch				
Hire of smoking kiln	1,500		900	600
Firewood	4,833		4,080	1,000
Salt	20,000		.	
Transport	4,000		2,000	
Labour	3,367		4,920	5,000
Depreciation	135		75	
Total costs	22,790		11,240	6,600
Other species				
Hire of smoking kiln	10,500		.	
Firewood	5,750		1,400	
Labour	7,000		3,667	
Depreciation	120		90	
Total costs	18,060		5,157	

Source: FIRRI, survey data

7.3.3 Processors Outputs and Incomes

Revenues for processors and quantities of Nile perch processed increased. Processors of other species were making losses due high total costs met such as hire of smoking kilns and firewood expenses. The prices of Nile perch destined for processing are lower compared to average prices at which producers sell implying that processors are buying low quality Nile perch (juveniles/ rejects) (table 7.9).

Table 7.9: Average weekly Cost of Raw Fish and Revenues

	Smoking kiln		**Smoking pit**	
	2003	**2002**	**2003**	**2002**
Nile perch				
Quantities processed	35.7	12.5	88.4	
Buying price/ kg	833	800	700	
Selling price/ kg	1,400	1,300	1,000	
Cost of fish	32,333	10,000	64,560	
Gross revenue	55,167	16,250	93,240	
Net revenue	4,710	-350	19,040	
Other species				
Quantities processed	89.0		30.7	
Buying price/ kg	800		900	
Selling price/ kg	1,000		1,200	
Cost of fish	71,200		27,267	

Gross revenue	89,000		35,867	
Net revenue	-260		3,443	

Source: FIRRI, survey data

7.4 Fish Marketing

7.4.1 Overview

There were approximately 30 bicycle traders and 4 boat traders (2 were based in Runga and 2 in Butiaba).

7.5 Fish Consumption

Both fishery and non-fishery consumers were consuming Nile perch; this could be attributed to the absence of factory trucks at the beach. Fish producers did not pay for the Nile perch consumed in their households in 2003 but were paying for tilapia implying that tilapia is a preferred species and consumers are willing to pay for it. Prices of Nile perch were relatively lower than the average selling prices of fish producers implying that consumers were buying low quality Nile perch. There were significant variations in the weekly per capita consumption of Nile perch and frequency levels among fish processors. Weekly per capita consumption of tilapia declined whereas frequency levels increased among people who are not employed in fishery related activities. There was an increase in prices of tilapia for consumption.

Table 7.10: Consumption Levels and Prices

	Consumers not involved in fishery activity		**Fish producers**		**Fish processors**		**Fish traders**	
	2003	2002	2003	2002	2003	2002	2003	2002
Nile perch								
Household size	7	2	10	9	9	10	8	3
Household consumption (kg)	3.3	.6	2.7	2.4	4.4	2.0	2.0	2.0
Daily per capita consumption (kg)	.5	.3	.3	.3	.5	.2	.3	.7
Frequency of consumption (days/ wk)	4	7	6	5	5	2	7	4
Weekly per capita consumption (kg)	2.1	2.1	1.7	1.5	2.3	.4	1.8	2.7
Price (Shs/ kg)	835	700	.	800	736	700	1,000	
Weekly expenditure (Shs)	12,210	3,430	.	10,050	15,957	2,800	14,000	
Tilapia								

Household size	4	3	7	9	.		4	10
Household consumption (kg)	1.4	1.8	1.8	2.5	.		1.4	2.8
Daily per capita consumption (kg)	.3	.7	.3	.3	.		.4	.3
Frequency of consumption (days/ wk)	6	5	4	6	.		4	5
Weekly per capita consumption (kg)	1.83	3.6	.93	1.5	.		1.75	1.7
Price (Shs/ kg)	1,000	850	2,000	933	.		1,000	700
Weekly expenditure (Shs)	4,833	7,200	12,000	16,333	.		5,508	9,500
Other species								
Household size	5		10	9	5		2	
Household consumption (kg)	1.5		3.5	2.7	1.5		2.0	
Daily per capita consumption (kg)	.3		.4	.3	.3		1.0	
Frequency of consumption (days/ wk)	3		5	4	4		3	
Weekly per capita consumption (kg)	1.2		1.8	1.1	1.3		3.0	
Price (Shs/ kg)	938		.	450	917		1,000	
Weekly expenditure (Shs)	4,713		.	2,850	5,200		6,000	

Source FIRRI survey data

8. Conclusion and Recommendations

The number of factory trucks has reduced at most beaches on both lakes and in Apac trucks had ceased operating in the district. However, their presence at some beaches has led to continuous increase in prices of fish, especially Nile perch and tilapia, subsequently leading to improvements in the livelihoods of boat owners and crewmembers as reflected by their higher incomes. Local authorities have also benefited from improved revenue collection as a result of improvements in collection of dues on revenues sources such as specific licence and fish movement permits. This explains why districts have supported the operations of chilled transport facilities through provision of public facilities and infrastructure in support of the activities.

The presence of chilled transport facilities at beaches has continued to displace local processors and traders and considerably reduced incomes for the remaining processors and traders. Therefore, it is important to reconsider the policy on fish export trade taking into account the number and capacities of the existing factories.

The livelihoods of local fishers have also been affected by the numerous operations undertaken by the contract staff together with the District Fisheries Offices against illegal gears. The operations led to confiscation and burning of illegal gears and therefore affecting fishing activities at most beaches.

The presence of chilled transport facilities on Lake Albert has also attracted new fishers from Lake Victoria, West Nile and DRC hence leading to increase in fishing effort. It was also reported that there were declines in Nile perch catches landed attributed to suspected decline in stocks. Therefore, there is need to control fishing effort and to undertake stock and catch assessment studies.

Appendix 1: PRINCIPAL PERSONS MET

Name	Designation
Mr. Nsamba David	DFO, Nakasongola
Mr. Apio Gloria	FO, Apac
Mr. Musenero Richard	DFO, Kamuli
Mr. Baguma Richard	DFO, Masindi
Mr. Rugadya Richard	DFO, Hoima
Mr. Abdu Kawalya	LC 1 Chairman, Kansiira
Mr. Ayo Emmanuel	Gabunga, Kayei
Mr. Godfrey Kiwanuka	LC 1, Irimeria
Mr. Ogwal George	AFO, Runga Landing Site
Mr. Barugahara David	Traders rep. Centre Master Committee, Kabolwa landing site
Mr. Jaria Akonga	Vice chairman Centre Master

Appendices

FISHERIES RESOURCES RESEARCH INSTITUTE COMPONENT
GLOBALISATION AND FISH UTILISATION AND MARKETING STUDY

Unit questionnaire for production sub-sector enterprises

A. BACKGROUND INFORMATION

Date _____

Name of enumerator _____

1) Lake _____
2) District _____
3) Name of beach _____
4) Name of respondent _____
5) Household size _____

B. INPUT/COST

Capital

6) Do you own a boat? [1] Yes [2] No.

7. If yes where did you buy your boat from?
[1] From this beach. [2]. Other (specify)_____

8. How much did you buy your boat? Shs._____

9) If no, do you rent a boat? [1] Yes [2] No

10) If rented, how much do you pay for renting the boat? Shs. _____(Per day/ Week/ Month)

11) If rented, what type of boat do you rent?
[1] Dug-out [2] Parachute [3] Ssesse [4] Congo barike [5] Other _____

12) Does the boat you own/ rent use an outboard engine? [1] Yes [2] No=> *Go to Qu35*

13) If yes, do you own or hire the outboard engine?
[1] Own => *Go to Qu30* [2] Hire.

14) If, owned, how much did you buy your engine? Shs. _____(Per day/ Week/ Month)

15) If hired, how much do you pay for hiring the outboard engine? Shs. _____(Per day/ Week/ Month)

16) What is the main type of fishing gear you use?
[1] Handlines [2] Longlines [3] Gill nets [4] Basket traps [5] Cast nets [6] Mosquito nets
[7] Beach seines [8] Boat seine [9] *Kaganga* (perforated troughs) [10] Scoop nets
[11] Other (Specify) _____

17) Where did you buy your gear from?
[1] Retail shops [2] Gear manufacturing factories [3] Home made [4]] Gear manufacturer at beach [5] Other (Specify)_____

Fill in information on gears

18) Number	19) Size (where applicable)	20) Cost price

Labour
21) How many crews do you employ per boat? _____

22) How is the crew on your boat remunerated?
[1] Fixed wage rate: Mention amount _____ per day/week/month
[2] %age of revenue: %age _____
[3] %age of net revenue: %age _____
[4] Other _____

23) How many days in a week do your crews work? _____ days

Other costs

Fill in information on other costs involved

Item	**Cost per fishing day/week/month**	**Indicate source of input where necessary**
24) Fuel		
25) Baits		
26)		
27)		

C. OUTPUT/INCOME

28). What is the main fish species that you target?
[1] Nile perch [2]Tilapia [3] Mukene [4]Hyrocynus [5]Alestes (angara) [6] Brycinus nurse [7] Bagrus [8] Protopterus [9] Other _____

Fill in information in table below

Species	**Average daily Quantity sold (in Kgs)**				**Average selling price**
	Good day	**Bad day**	**Yesterday**	**Today**	**(Ug. Shs/ kg)**
29) Nile perch					
30) Tilapia					
31) Mukene					
32) Hyrocynus-					
33) Alestes-baromous					

D. CONSUMPTION

34) What fish species do you most commonly eat at home?
[1] Nile perch (pete) [2] Tilapia [3] Mukene [4] Hyrocynus F (tiger)
[5] Alestes- baromous(angara) [6] Bagrus bayad(lanya) [7] Brycinus nurse
[8] Proteptorus [9] Others (specify)_____

35). Household size_____

36). How much fish does your family eat each day? _____ Kgs

37). How often does your family eat fish per week? _____

38). Do you buy the fish you eat?
[1] Yes [2] No=> *Go to Qu82*

39). If yes, at what price per kg? Shs. _____

FISHERIES RESOURCES RESEARCH INSTITUTE COMPONENT
GLOBALISATION AND FISH UTILISATION AND MARKETING STUDY

Unit Questionnaire for Fish Marketing Sub-Sector

A. BACKGROUND INFORMATION

Date _____

1. Lake _____
2. District _____
3. Landing _____
4. Name of enumerator _____

B. INPUTS/ COSTS

Capital

5. What type of trader are you?
   [1] Bicycle trader [2] pick-up trader [3] Boat trader
   [4] Factory agent [5] Beach side retailer [6] Other (Specify) _____

6 What fish trading assets do you own?

ASSET	**YEAR OF ACQUISITION**	COST PRICE	**EXPECTED USEFUL LIFE**	**SALVAGE VALUE**
[1] Bicycle				
[2] Basket				
[3] Ice boxes				
[4] Truck				
[5] Boat				
[6] Engine				
[7] Stall/slab				
[8]				

7. What other inputs do you use and what are their costs?

INPUT	**QTY**	**UNIT COST**
Fuel		
Ice		

8. How many days a week do you operate? _____

Labour

9. What sources of labour do you use?
   [1] Self-employment [2] Family labour
   [3] Hired labour [4] Other (Specify) _____

10. Provide the information below:

SOURCE OF LABOUR	NUMBER	UNIT COST/ DAY/ WK/MONTH
[1] Self-employment		
[2] Family labour		
[3] Hired labour		
[4] Other		

OUTPUT/ INCOME

11. What is the main fish species that you trade in?
   [1] Nile perch [2]Tilapia [3] Mukene
   [4]Hyrocynus [5]Alestes baromous [6] Brycinus nurse
   [7] Bagrus bayad [8] Protopterus
   [9] Other (Specify) _____

12. Provide the information below:

SPECIES	AVERAGE WEEKLY QUANTITY TRADED	BUYING PRICES (KG)	SELLING PRICES (KG)
[1] Nile perch			
[2] Tilapia			
[3] Mukene			
[4] Hyrocynus-			
[5]Alestes-baromous			
[6]Aleste nurse			
[7] Bagrus bayad			
[8] Protopterus			
[7] Other			

D. CONSUMPTION

13. What fish species do you most commonly eat at home?
   [1] Nile perch (pete) [2] Tilapia [3] Mukene
   [4] Hyrocynus F (tiger) [5] Alestes- baromous(angara)
   [6] Bagrus bayad(lanya) [7] Brycinus nurse
   [8] Proteptorus [9] Others (specify)_____

14. How much fish does your family eat each day? _____ Kgs

15. How often does your family eat fish per week? _____

16. Do you buy the fish you eat?
[1] Yes [2] No

17. If yes, at what price per kg? Shs. _____

Thank you

FISHERIES RESOURCES RESEARCH INSTITUTE COMPONENT
GLOBALISATION AND FISH UTILISATION AND MARKETING STUDY

Unit Questionnaire for Fish Processors

Date _____

1. Lake _____
2. District _____
3. Landing _____
4. Name of enumerator _____

A INPUT /COST

Capital

5. What fish processing facilities do you own?
   [1] Smoking kiln [2] Smoking pit
   [3] Drying rack [4] Other (Specify)_____

6. What is the status of ownership of the processing unit
   [1] Privately owned. [2] Communally owned
   [3] Hired [4] Other (Specify)_____

7. Provide information on the following:

Asset	**Qty**	Cost price (Ug. Shs)
1. Smoking kiln		
2. Drying rack		
3. Wire mesh		
4.		
5.		

8. If hired/ communal, how much do you pay? Shs._____ per day/week/month

9. What other inputs do you use and how much do you pay?

ITEM	**QTY**	**UNIT COST (Ug. Shs)**
Firewood		
Salt		
Transport		

Labour

10. Provide information on the table below: (Source)

SOURCE OF LABOUR	NUMBER	UNIT COST/ DAY/WK/MONTH
[1] Self-employment		
[2] Family labour		
[3] Hired labour		
[4] Other		

11. How many days do you operate in a week?_____

C. OUTPUT/ INCOME

11. What is the most common fish species you process?
[1] Nile perch [2] Tilapia [3] Mukene [4] Hyrocynus [5]Alestes-baromous
[6]Aleste nurse [7] Bagrus bayad [8] Protopterus [9] Other (Specify)_____

12.Provide the information

SPECIES	AVERAGE WEEKLY QUANTITY PROCESSED (IN KGS)	BUYING PRICES (KG)	SELLING PRICES (KG)
[1] Nile perch			
[2] Tilapia			
[3] Mukene			
[4] Hyrocynus-			
[5]Alestes-baromous			
[6]Aleste nurse			
[7] Bagrus bayad			
[8] Protopterus			

D. CONSUMPTION

13. Commonly consumed fish species at home?
[1] Nile perch (pete) [2] Tilapia [3] Mukene
[4] Hyrocynus F (tiger) [5] Alestes- baromous(angara)
[6] Bagrus bayad(lanya) [7] Brycinus nurse
[8] Proteptorus [9] Others (specify)_____

14. House hold size_____

15. How much fish does your family eat each day _____ Kgs

16. Frequency of fish consumption per week _____

17. Do you buy the fish you eat?
[1] Yes [2] No
18. If yes at what price do you buy per kilogram Shs. _____

FISHERIES RESOURCES RESEARCH INSTITUTE COMPONENT
GLOBALISATION AND FISH UTILISATION AND MARKETING STUDY

Unit Questionnaire for Fish Consumers

A. BACKGROUND INFORMATION

Name of enumerator _____

Date _____

4. Lake _____
5. District _____
6. Landing _____

B. CONSUMPTION

7. What fish species do you most commonly eat at home?
   [1] Nile perch (pete) [2] Tilapia [3] Mukene
   [4] Hyrocynus F (tiger) [5] Alestes- baromous(angara)
   [6] Bagrus bayad(lanya) [7] Brycinus nurse
   [8] Proteptorus [9] Others (specify)_____

8. Household size _____

9. How much fish does your family eat each day? _____ Kgs

10. How often does your family eat fish per week? _____

11. Do you buy the fish you eat?
    [1] Yes [2]. No

12. If yes, at what price per kg? Shs. _____