

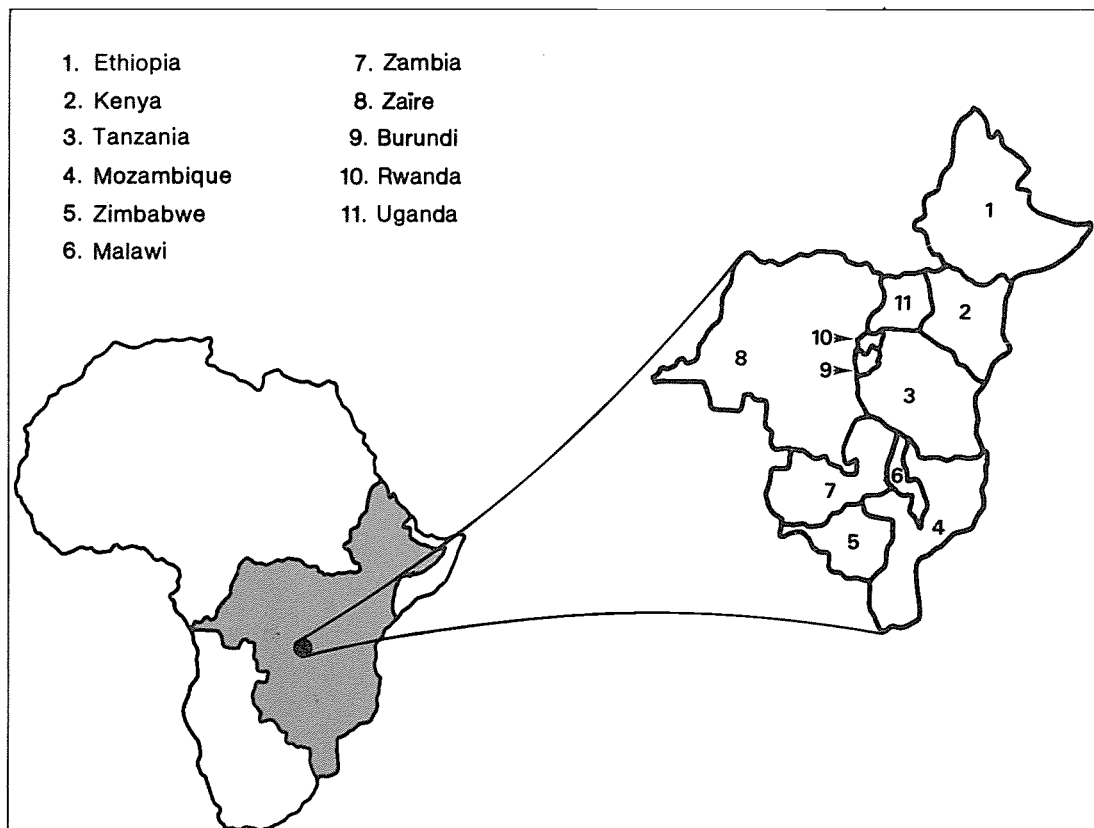
REGIONAL PROJECT FOR INLAND FISHERIES PLANNING, DEVELOPMENT AND
MANAGEMENT IN EASTERN/CENTRAL/SOUTHERN AFRICA (I.F.I.P.)

IFIP PROJECT

RAF/87/099-TD/44/92 (En)

January 1993

A marketing study on the Tanzanian part of Lake Victoria:
-the Mwaloni Kirumba market, Mwanza, and
the export market for fresh fish and fillet-



UNITED NATIONS DEVELOPMENT PROGRAMME



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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A marketing study on the Tanzanian part of Lake Victoria:
-the Mwaloni Kirumba market, Mwanza, and
the export market for fresh fish and fillet-

by

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PREFACE

The IFIP project started in January 1989 with the main objective of promoting a more effective and rational exploitation of the fisheries resources of major water bodies of Eastern, Central and Southern Africa. The project is executed by the Food and Agriculture Organisation of the United Nations (FAO), and funded by the United Nations Development Programme (UNDP) for a duration of four years.

There are eleven countries and three intergovernmental organisations participating in the project: Burundi, Ethiopia, Kenya, Malawi, Mozambique, Uganda, Rwanda, Tanzania, Zambia, Zaire, Zimbabwe, The Communauté Economique des Pays des Grands Lacs (CEPGL), The Preferential Trade Area for Eastern and Southern African States (PTA) and the Southern African Development Co-ordination Conference (SADCC).

The immediate objectives of the project are: (i) to strengthen regional collaboration for the rational development and management of inland fisheries, particularly with respect to shared water bodies; (ii) to provide advisory services and assist Governments in sectoral and project planning; (iii) to strengthen technical capabilities through training; and (iv) to establish a regional information base.

PREPARATION OF THIS DOCUMENT

This document presents the results of a marketing study conducted on the Tanzanian part of Lake Victoria. The study consisted of two major components. Firstly, a study centred on Mwaloni Kirumba, one of the major trading centres for fresh and, especially, processed fish. Prices, quantities, margins, origins, and destinations of fish traded at the market are presented. Secondly, exports of fresh and filleted fish from Lake Victoria and a description of the activities of the fish processing plants situated at Lake Victoria have been assessed and are presented in part two of the report.

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IFIP PUBLICATIONS

Publications of the IFIP project are issued in two series:

A series of technical documents (RAF/87/099-TD) related to meetings, missions and research organized by the project.

A series of working papers (RAF/87/099-WP) related to more specific field and thematic investigations conducted in the framework of the project.

For both series, reference is further made to the document number (44), the year of publication (93) and the language in which the document is issued: English (En) or French (Fr).

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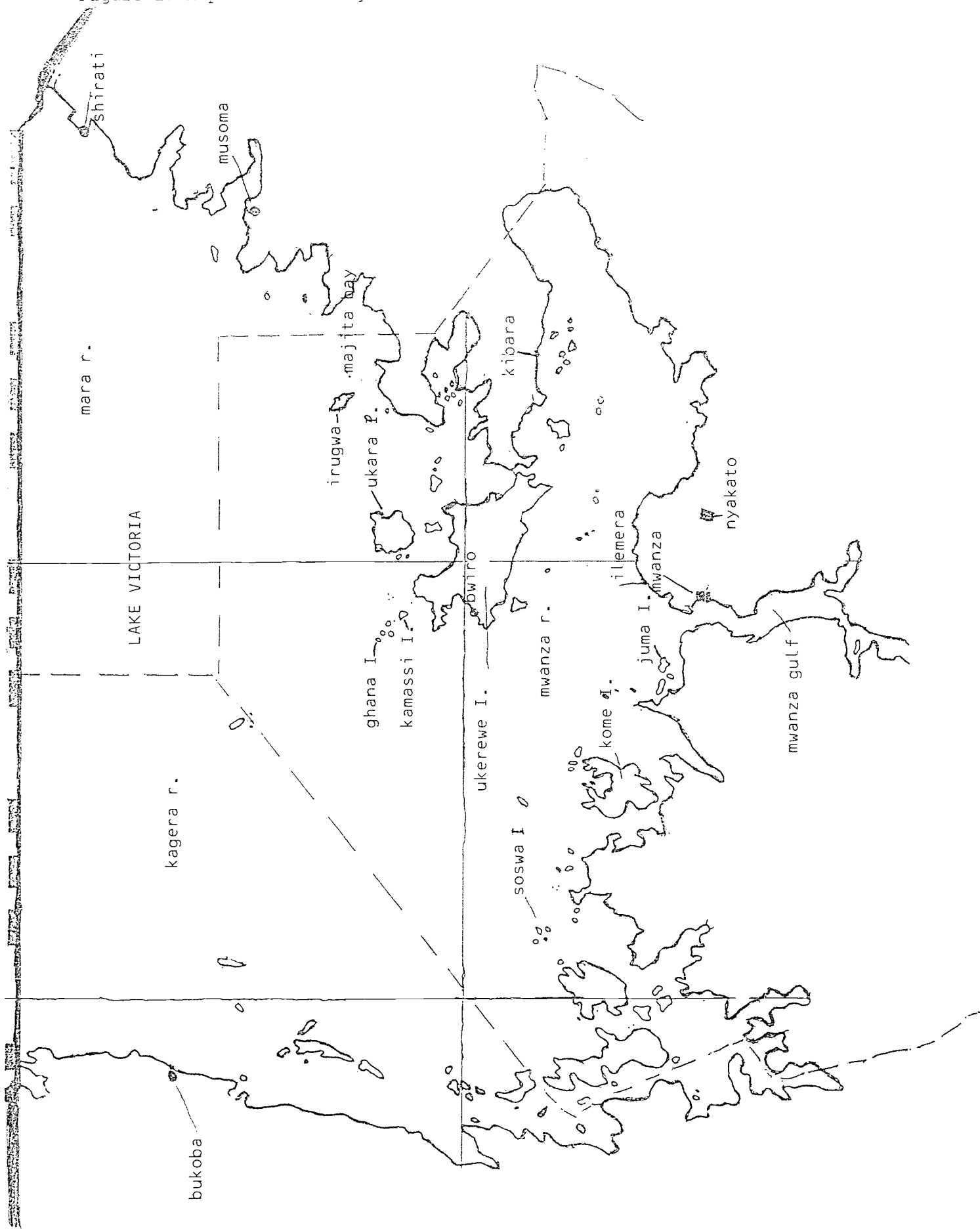
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CURRENCY CONVERSION RATE

The conversion rate used for the calculations in the report is:
1 US\$ = 400 Tanzanian Shillings.

Figure 1. Map of the survey area



SUMMARY OF MAIN RESULTS AND RECOMMENDATIONS

1. Out of a total of 318 traders working at the Mwaloni Kirumba market, 191 have been sampled. Traders can be divided in three categories, namely, cooperative license holders, individual license holders, and non-license holders.
2. During the marketing study at Mwaloni Kirumba only four species, Nile perch, tilapias, *Dagaa*, and Protopterus were traded.
3. The turnover of Mwaloni Kirumba for July 1992 is estimated to be US\$ 606,279, total margin US\$ 69,649. Fresh fish has the lowest market turnover, 8% of the total market turnover. The turnover of processed Nile perch is 19% of the total turnover. *Dagaa* has the highest turnover, 73% of the total market turnover. A high percentage of the turnover is earned by a small number of traders.
4. For fresh fish, Nile perch, with 95% of the total fresh fish trade, is traded most.
5. Sun dried Nile perch accounts for about 87% of the trade in processed Nile perch (smoked Nile perch 13%) and is distributed further than smoked Nile perch. Reasons for this are the vulnerability of smoked Nile perch and consumer preferences, especially in Zaire.
6. Of the processed Nile perch, 17% is processed in Kagera and Mara region. For *Dagaa* this percentage is 9. It is remarkable how small this percentage is. Reasons may be the low production in Kagera and Mara region of processed Nile perch and processed *Dagaa*; a misconception on the national importance of Mwaloni Kirumba as a market where a high percentage of processed fish harvested in the three regions is traded; or constraints in the distribution channel from the regions to Mwaloni Kirumba. When looking at product destinations it can be concluded that Mwaloni market is of high importance for Tanzania. The fish is distributed nationwide and exported.
7. The traders in fresh *Dagaa* and Protopterus are active in retailing. The traders in fresh Nile perch and Tilapia are active in retailing and wholesaling. Trade in processed Nile perch and *Dagaa* is mainly wholesale.
8. It is recommended not to allow illegal traders to operate at Mwaloni Kirumba, since these traders do not pay the Mwanza Municipal for operating on the market, while using the market's facilities.
9. It is recommended to support further investigation in the reasons why only a small percentage of processed fish traded at Mwaloni Kirumba are harvested and processed in Kagera and Mara region.
10. The estimated exports of fresh and filleted Nile perch, for the period of July 1991 to July 1992, are 25,240 and 3,360 tons respectively. Fresh fish is exported to Kenya and in one case to Burundi. The fillet is for 75% exported to Europe, followed by Israel where 13% is exported. It is likely that in the future a much higher percentage will be exported to Israel.

11. At the time of the field visits thirteen companies were active in trading/exporting and two in processing/exporting. In the future there will be six traders/exporters and thirteen processors/exporters.
12. The composition of Nile perch exports will change substantially, since thirteen processing companies will be operational by July 1993. Furthermore, seven of the companies who were exporting whole fish will stop this activity and will start supplying the processing plants in which they are partners. The processing companies will have a maximum yearly freezing capacity of 110,800 tons of fillets. Even if companies function at 50% capacity, fillets/exports would represent over 150,000 tonnes of fresh fish. This is to be compared with present Nile perch production of about 175,000 tons.
13. Companies can earn back their investment in a very short period of time, one or two years, and will therefore not have a high concern for future over-exploitation of Lake Victoria. The estimated profit of a Tanzanian processing company is more than US\$ 3 Mln., assuming, among others, sufficient fish supply.
14. All processing companies will work with artisanal fishermen. Some consider artisanal fishing with company-owned boats, trawling, or cold storage facilities in other regions, especially if the fish supply does not meet the plant's normal capacity.
15. The companies integrate or are planning to integrate backwards to assure the quality and availability of the fish. Backward integration happens when companies try to contact the fishermen or go into fishing themselves (artisanal or trawling).
16. Undeclared exporting of fish can occur by road (trucks, not or under declaring) or Lake (Kenyan collection vessels coming into Tanzanian waters or Tanzanian fishermen selling in Kenyan waters). Undeclared exports are estimated to be 7180 tons yearly (20% of total export).
17. Since figures on Maximum Sustainable Yield for Lake Victoria are dated, it is recommended to strongly support initiatives for a renewed estimation on Maximum Sustainable Yield and following from this figure an estimation on Maximum Economic Yield.
18. It is recommended not to allow new processing companies to start operations in the regions of Lake Victoria until Maximum Sustainable Yield has been estimated, enabling the Tanzanian government to assess the future situation of Lake Victoria fisheries. Furthermore, in view of the very high proportion of Nile perch catch which is soon to be processed for exports, the immediate impact on the local market should be assessed as well.
19. Because of the poorly functioning operations of the railways and the poor road conditions companies hesitate or refrain from distributing the fillet via the port of Dar es Salaam. To change this situation it is recommended to improve the quality of these infrastructures.
20. Artisanal fishermen will, in the short term, take advantage of the future situation, because all the companies will be working with them. However, should the fish supply not meet the normal capacity of the

plants, the companies consider going into artisanal fishing or trawling, threatening longer-term income of the fishermen. To protect the longer-term income of the fishermen, it is therefore recommended to ban trawling from the Tanzanian part of Lake Victoria.

1. INTRODUCTION

1.1 Background

Of the total Tanzanian fish landings over 85 percent is provided by inland fisheries, employing 50,000 full-time and twice as much part-time fishermen. In the following stages of distribution 2 to 3 times as many people are employed (Leendertse and Horemans, 1990).

Lake Victoria accounts for 49 percent of total inland production and is estimated to contribute 100,000 tons (1989) to the total Tanzanian catch (Gréboval et al, 1989). One of the reasons for the rapid increase of Lake Victoria fish production is the proliferation of Nile perch. Prior to the proliferation of Nile perch, Lake Victoria fisheries used to be a multi-species fisheries comprising of tilapias, Protopterus, Baqrus, Clarias, Synodontis, Labeo, Haplochromines, Barbus, Alestes, and Schilbe. After the stabilization of Nile perch in all habitats, Lake Victoria fisheries have been reduced to three main fisheries, namely, in order of economic importance, Nile perch, Rastrineobola argentea (*Dagaa*) and Tilapia. Nile perch has brought important benefits in terms of employment, financial returns to the industry and reduced consumer prices, while the major socio-economic objections to the fish have been overcome by the riparian populations.

For a long time large scale industrial processing and marketing has not developed uniformly around the Lake, presumably because of distribution and marketing system constraints (Reynolds and Gréboval; 1988). Since the introduction of the Tanzanian Trade Liberalization Policy of 1987 and the National Investment Code of 1991, large scale processing has also been established in Tanzania. A problem arising with the development of large scale industrial processing is the possibility of economic displacement of artisanal fishermen, petty traders and women using traditional processing techniques.

With growing evidence of Nile perch and other species becoming heavily exploited, the need for proper and effective management and planning of the fisheries is an important issue facing Tanzania. To manage and plan the fisheries in a proper way the management information base of the Tanzanian government needs to be strengthened. The research at Mwaloni Kirumba and the study of exports of fresh and industrially processed Nile perch are intended to contribute to the socio-economic part of the management information base.

1.2 Purpose of the study

The purpose of the study was: (a) to broaden the insight into the marketing and distribution of the Tanzanian Lake Victoria fisheries, (b) to assess the frozen and filleted fish exports from Lake Victoria and, (c) to provide recommendations to improve the management of Tanzanian fisheries.

1.3 Background to the study

Information on marketing and distribution of fish forms part of the socio-economic information base needed to be able to manage the fisheries of Lake Victoria. To broaden the insight into the marketing and distribution of Lake Victoria fish, the major trading centre for local marketing and export oriented large scale trading in Tanzania, Mwaloni Kirumba, was selected. At Mwaloni Kirumba fish, harvested in the three Tanzanian regions of Lake

Victoria, is traded. The market is believed to cover 90% of the trade in processed fish of the Tanzanian part of the Lake.

More socio-economic information is provided by a description of the market for fresh fish and filleted fish exports and an assessment of these exports.

The study has been conducted in close collaboration between the Regional Project for Inland Fisheries Planning (IFIP) and the Tanzanian Fisheries Research Institute (TAFIRI), which provided technical inputs and logistical support.

1.4 Framework of the report

The report is structured as follows:

The first chapter gives a summary of the background and purpose of the study.

In the second chapter the methodology used in the marketing research is described. The chapter is split in two sections: section 2.1 presents a description of the survey area, whereas section 2.2 looks into the problem definition, the research design, data collection, and data processing.

Chapter 3 presents the results of the Mwaloni Kirumba research and a description of the Mwaloni Kirumba market. Section 3.1 gives a brief introduction. In section 3.2 the results of the interviews with fresh fish traders are presented. Section 3.3 discusses the results of the interviews with traders in processed Nile perch. In section 3.4 the results of the interviews with *Dagaa* traders are presented. Section 3.5 gives the summary and recommendations of this marketing study.

The fourth chapter presents the results obtained from the research of fresh and filleted fish exports and activities of the fish processing plants. Section 4.1 begins with a short introduction of the market. In section 4.2 the companies active in the market and the way the market is and will be organized in the near future are discussed. Section 4.3 describes the distribution channel from the fisherman to Mombasa port. In section 4.4 prices in the various stages of distribution, quantities and the present and future capacity of the plants are presented. Section 4.5 gives an overview of the trading and processing activities in the three Lake Victorian regions. Section 4.6 deals with undeclared exports and gives the total estimated exports of Nile perch from Tanzania. The final section, 4.7, presents the conclusions and recommendations.

The appendices contain the terms of reference of the survey, the questionnaires used during the research, a profit calculation of a processing plant, and a comment on fish maws.

1.5 Definitions

The terms used in the report are defined as follows:

- * Trader : Person who buys and sells on the fish market. The trader can be a wholesaler or a retailer.
- * Transporter : Person who transports to and from the fish market. A transporter may well be active in trading.

- * Agent : Person buying on the market for a transporting/exporting or a processing/exporting company.
- * Wholesaler : Trader who sells to others than consumers generally in large quantities.
- * Retailer : Trader who sells directly to consumers.
- * Fishing boat : Boat mainly used for fishing. The boat can also be used for transporting the catch to the market.
- * Transport boat : Boat only used for transporting the fish. This type of boat often of a larger size.

2. METHODOLOGY

2.1 The survey area

For the marketing research at Mwaloni Kirumba the survey area was restricted to Mwaloni Kirumba and three destinations of fish traded at Mwaloni Kirumba, namely Mwanza market, Dar es Salaam, and Mtwara. Mwaloni Kirumba is an extremely busy landing site where, apart from fish, a number of products are also traded: firewood, charcoal, clothes, fruit, and farm products such as cassava, maize, and millet. Trade is mostly wholesaling although some retailing has also been observed. In Dar es Salaam the Kariakoo market, and in Mtwara the central market were visited.

The survey area for the estimation of quantities of fresh and filleted fish exports was the three regions of the Tanzanian part of Lake Victoria. Export license holders are active in Bukoba, Mwanza, Kiseke, Ilemera, Nyakato, Musoma, Mazao, and Nyang'ombe Shirati.

2.2 The marketing research

2.2.1 Problem definition

The purpose of the study is worked out in the following problem definition:

1. Determine the origins, destinations, prices, quantities and margins of fish traded at Mwaloni Kirumba.
2. Determine the quantities, prices, and destinations of fresh and filleted fish exports from the Tanzanian part of Lake Victoria and determine present and future capacity of the processing plants.

2.2.2 The research design

The origins, destinations, prices, quantities and margins of fish traded at Mwaloni Kirumba have been assessed by interviewing 60% of the traders operating at Mwaloni Kirumba. The survey planned to cover the full population (318 registered traders), but this was not possible because a large group of smaller traders was only occasionally present. The traders were divided in three categories, namely, traders of processed *Dagaa*, traders of processed Nile perch, and traders of fresh fish. Traders were well informed on origins and destinations of the fish. Therefore only a small number of transporters were interviewed, mainly to obtain additional information like means of transportation to and from Mwaloni Kirumba.

For the second aspect of the problem definition a list of export-license holders was obtained from the Fisheries Department in Dar es Salaam. The list was checked at the Regional Fisheries Offices to determine which of the export-license holders were active in exporting at the time. All export license holders, traders and processors, were visited and interviewed.

The data collection and processing took eight weeks, preparing the questionnaire and training the interviewers two weeks. Report writing was also done in two weeks.

The questions in the questionnaire for export-license holders included the following areas of information:

- Information on ownership of the company
- Freezing capacity of the company
- Destinations of product
- Quantities handled
- Price of products
- Market structure
- Undeclared exports

The questions in the questionnaire for traders and transporters included the following areas of information:

- Information on the trader/transporter
- Means of transportation
- Species traded
- Prices and quantities
- Origins and destinations
- Vertical and horizontal integration
- Information on customers and suppliers
- Market structure

The first outline of the questionnaires was discussed in Dar es Salaam and Mwanza with TAFIRI. The next step was to train the interviewers and to field-test and adjust the questionnaires. Problems encountered, during field-testing, with the questionnaires were:

1. Definitions. There was considerable misunderstanding on the definition of words, like: transporters, retailers, consumers, transport boats, fishing boats, etc.
2. Purpose of the study. Interviewers were not sufficiently informed on the purpose of the study. Traders sometimes hesitated to give information because interviewers could not correctly explain how the information would be used.
3. Reason for asking a question. It was not properly explained to interviewers how the answer to a question would be used in the processing phase. When 'unexpected' answers were given by the traders, interviewers did not know how to deal with these.

Definitions, purpose of the study, and future use of the questions was extensively discussed with the interviewers before starting the marketing study. The final version of the questionnaires is included in appendices 2, 3, and 4.

2.2.3 Data collection

Data collection at Mwaloni Kirumba took place during 15 days. On average, three interviews per person per day were conducted. Two interviewers were dealing with the traders of processed *Dagaa*, one was dealing with processed Nile perch, and one with fresh fish.

Interviews with traders in fresh fish and processed Nile perch generally went smoothly, although statements on prices often were not correct. Interviews with *Dagaa* traders caused more problems because of lack of confidence by the traders in the purposes of the research. Six traders refused to be interviewed.

There were three types of traders, namely, individual license holders, cooperative license holders, and non-licensed traders. To make sure that all types were interviewed names of the traders and the group they belong to were provided by the Mwanza municipal and checked with market officials and chairmen of the cooperatives.

Whenever possible, traders were interviewed separately from others for the information provided to be as accurate as possible. When interviewed among other traders answers tended to be biased.

Data collection for the assessment of exports took a month. In total 21 interviews were conducted. Respondents were hard to get in contact with, but cooperative during the interviews.

2.2.4 Data processing

Data processing of the Mwaloni Kirumba questionnaires has been done together with the interviewers.

Since not all the traders have been interviewed the results given in Chapter 3 are estimates. The traders not interviewed were smaller traders. For the determination of market turnover, margin of the traders, and total quantity traded, traders not interviewed were assessed to each have traded a quantity determined as follows. The 15% traders with the lowest quantity traded in the sample were selected. The average quantity traded by these traders was determined. This average quantity was multiplied by the number of traders not interviewed. The result was added to the quantity traded in the sample.

Because a large percentage of smaller traders were not interviewed, an income distribution for the three categories is not presented in the results. The income distribution of the sample would not be representative for the population.

Data processing of quantities, prices, and destinations of fresh and filleted fish exports has been done by the authors.

3. THE MWALONI KIRUMBA MARKET

3.1 Introduction

A total of 191 traders, around 60 % of the population, were interviewed (see Table 1). Traders not interviewed were smaller traders, often absent and when on the market hard to get into contact with.

	cooperative license		individual license		non-licensed		total	
	N	n	N	n	N	n	N	n
Processed <i>Dagaa</i>	157	81	9	9	—	—	166	90
Processed Nile perch	56	46	3	3	28	8	87	57
Fresh fish	40	22	—	—	25	22	65	44
Total	253	149	12	12	53	30	318	191

3.2 Fresh fish

Traders in fresh fish, except agents of exporting companies, were working independently. None of the traders reported to have employees working on the market. One trader reported to be active in fishing, others were only active in trading at Mwaloni Kirumba. 66 % of the traders were working 6 or 7 days at Mwaloni Kirumba. The remaining 44 % work less than 6 days, mostly very irregularly. Because a number of traders lacked funds they have formed a cooperative to be able to purchase entire catches from fishermen.

By far the highest percentage, 86% of the traders, are active in trading Nile perch (see Table 2).

All traders purchase fish from fishermen at Mwaloni Kirumba.

	Number of traders*	% **
Nile perch	38	86
'Tilapias'	6	14
<i>Dagaa</i>	2	5
<i>Protopterus</i>	1	2

* n=44

** Percentages sum up to 107, because 3 traders are trading in various species

Nile perch, tilapias, and Protopterus are purchased in pieces; *Dagaa* in tins of 20 kg's. Selling is mostly done on the basis of 'whole fish' for the first three species; *Dagaa* is sold in tins of various sizes (see Table 3). It was observed that agents, who only trade in Nile perch, buy the pieces over three kg's, the smaller pieces are marketed by the other traders. Agents are reluctant to purchase smaller fish because of the higher risk of spoilage during transportation to Kenya.

Table 3. Units in which traders buy and sell the fresh fish.						
	Buying			Selling		
	Pieces	kg's	Tins	Pieces	kg's	tins
Nile perch	100 %			84 %	16 %	
'Tilapias'	100 %			90 %	10 %	
<i>Dagaa</i>			100 %			100 %
<u>Protopterus</u>	100 %			100 %		

All fish is harvested in Mwanza and Sengerema district (See Table 4). For Nile perch the locations mentioned most during interviews were Bwiru (Mwanza district), Juma Island and Nyakanyasi (Sengerema district). Fishermen who target Protopterus harvest near Irunda Island.

Table 4. Origins of fresh fish traded at Mwaloni Kirumba.		
	Mwanza district	Sengerema district
Nile perch	47 %	53 %
'Tilapias'	100 %	
<i>Dagaa</i>		100 %
<u>Protopterus</u>	100 %	

Nile perch is mostly transported to Mwaloni Kirumba by motorboat, hired or owned. Tilapia, Protopterus, and *Dagaa* are transported by fishing boats, mostly using paddles.

None of the traders reported to trade with the same suppliers. Traders, except agents, trade with different customers.

Agents paid Tshs. 75 to 80 per kg of Nile perch. Fish they rejected was sold to artisanal processors for Tshs. 50 per kg. Prices paid by other traders are depicted in Table 5. Prices in Table 5 for Nile perch and *Dagaa* are given in kg's. For tilapias it was not possible to determine prices per kg. The prices are given for the various sizes of the fish. The one trader who was trading Protopterus was not willing to give the prices at which he was selling and buying.

	Mwaloni Kirumba			Mwanza market	Kariakoo market Dar es Salaam		
	BP*	WSSP**	RSP***	RSP	BP	WSSP	RSP
Nile perch	50-70	70-90	80-110	120-140	220	250	320
Tilapia:							
Big > 2.5 kg	370-400	500	520	2.5 kg 500-600	-	-	-
Medium 2-2.5 kg	240-250	300	315	2 kg 350-400	-	-	-
Small < 2 kg	130	150	160	1.5 kg 250-300	-	-	-
Dagaa	20-25		25-30	-	-	-	-

- * Buying price
- ** Wholesale selling price
- *** Retail selling price
- Not found when visited

The estimated quantity traded 'fresh' in July 1992 at Mwaloni Kirumba was 234,347 kg's. Fresh Nile perch, with 95 % of the total trade (222,223 kg), is the most important fish for the market. Tilapia is following Nile perch with 4% of the total fresh fish trade. The quantities of *Dagaa* and *Protopterus* traded are small, less than one percent. During the interviews no other species than those given in Table 6 were traded on the market.

	Estimated quantity*	Quantity of sample	%
Nile perch	222,223	213,814	95
'Tilapias'	10,324	9,279	4
<i>Dagaa</i>	1,457	1,457	<1
<i>Protopterus</i>	343	343	<1
Total	234,347	224,893	100

* See: 2.2.4 Data processing

The estimated turnover of Nile perch for July 1992 is Tshs. 17,388,950 or US\$ 43,472. The total estimated margin (defined as average selling price minus average buying price, multiplied by the total quantity sold) of Nile perch traders has been Tshs. 2,500,009 or US\$ 6250. The agents are the traders with the highest turnover. There are generally eight agents operating on the market and take care of 70% of the trade in Nile perch. The margin per kg is higher for the traders than for the agents, Tshs. 20 as compared to Tshs. 7.5 (see Chapter 4). The estimated turn-over of Tilapia is Tshs. 1,383,416 or US\$ 3459. The estimated total margin is Tshs. 258,100 or US\$ 645. The margin per kg is Tshs. 25, which is higher than for Nile perch. This can be explained by the fact that the margin per kg. used for Nile perch is a wholesale margin, while

the margin for Tilapia is a retail margin. The retail margin for Nile perch is Tshs. 35. The traders in Tilapia traded , on average, a lower quantity than Nile perch traders. The turnover of *Dagaa* is estimated to be Tshs. 38,246 or US\$ 96, the margin Tshs. 5,564 or US\$ 14. For *Protopterus* turnover and margin cannot be given, because the price was not given by the trader. The turnover of fresh fish has been Tshs. 18,810,612 or US\$ 47,027. The total margin made by traders in fresh fish has been Tshs. 2,763,573 or US\$ 6,609. The results are depicted in Table 7.

Table 7. Turnover and margins of fresh fish.			Tshs.	US\$
Nile perch:				
Turnover	1. Agents		12,055,598	30,139
	2. Traders		<u>5,333,352</u>	<u>13,333</u>
Total			17,388,950	43,472
Total margin	1. Agents		1,166,671	2,917
	2. Traders		<u>1,333,338</u>	<u>3,333</u>
Total			2,500,009	6,250
Margin per kg	1. Agents		7.5	
	2. Traders		20	
Tilapia:				
Turnover			1,383,416	3,459
Total margin			258,100	645
Margin per kg			25	
Dagaa:				
Turnover			38,246	96
Total margin			5,464	14
Margin per kg			4	
Totals of fresh fish:				
Turnover			18,810,612	47,027
Total margin			2,763,573	6,909

The destination of Nile perch is for 70 % Kenya and 30 % Tanzania.

In Tanzania the fish is consumed or processed in Mwanza area or transported nationwide. Nile perch sold in Dar es Salaam is transported by truck, bus, or air. It has been observed that the fish is often transported frozen. Nile perch is transported to Kenya by truck to be industrially processed.

The 30 % of Nile perch marketed in Tanzania is sold to transporters, consumers, retailers and artisanal processors. Tilapia, *Protopterus*, and *Dagaa* are marketed in Mwanza area. Tilapia is sold to consumers and retailers. *Dagaa* and *Protopterus* are only sold to consumers.

3.3 Processed Nile perch

Nearly all traders interviewed were working six to seven days on the market. Traders not interviewed, mostly trading without a license, were occasionally active on the market. Government officials working at Mwaloni Kirumba reported that the traders shifted from market to market where the trade is best.

All trading is in whole fish and traders reported to be mainly active in wholesaling.

82 % (47) of the traders were dealing in sun dried Nile perch and 26 % (15) were dealing in smoked Nile perch. The percentages do not sum up to 100 because five traders were dealing in both.

The interviewer assumed that the traders had no other activities besides trading at Mwaloni Kirumba, since they were permanent on the market. A small sample taken later showed that quite a number of traders were involved indirectly in other activities, like fishing, processing, and transporting to Mwaloni Kirumba. Because the sample was small no exact figures can be given on this matter.

The prices of processed Nile perch are given in Table 8. The authors have not been able to give a price per kg. Prices on Mwaloni Kirumba are not only determined according to the weight of the fish. For sun dried Nile perch, traders reported, wholesale trade is in small or big fish. Smoked Nile perch is traded in small, medium, and big pieces.

	Mwaloni Kirumba		Mwanza market	Kariakoo market Dar es Salaam		Mtwara Central market	
	WSBP-1	WSSP-2	RSP-3	WSBP/RBP-5	WSSP/RSP	WSSP	RSP
Smoked:							
Small < 1 kg	120	135	175	Small pieces only	Small pieces	-	-
Medium 1-2 kg	150	165	200	100	120		
Big > 2 kg	170-5	185	250				
Sun dried:							
Small < 2 kg	100	125		Small < 1.5 kg 250	300	Small 600	Per kg.
Big > 2 kg	310	335		Medium 1.5-2 kg 400	500	Big 900-	500-
				Big > 2 kg 600	700	1200	600

- 1 Wholesale buying price
- 2 Wholesale selling price
- 3 Retail selling price
- 4 Fish over 3 kg fetch a higher price.
- 5 Traders reported to charge the same price for small and big quantities sold.

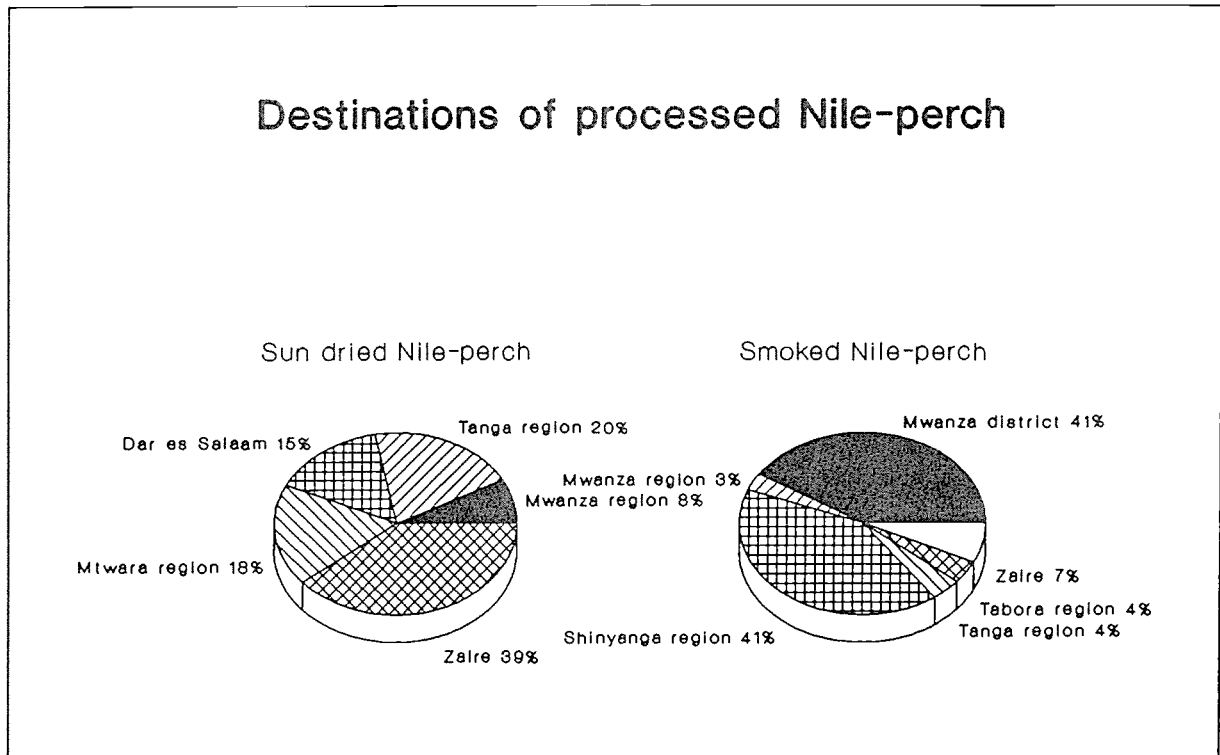
Since processed Nile perch is traded in pieces the average weight of the fish had to be estimated to determine the quantity traded in kg's. Traders and

market officials gave completely different estimates. It was necessary to weigh the fish. A sample, taken on one day gave an average for smoked Nile perch of 1.5 kg's and for sun dried Nile perch of 2.5 kg's. The quantity in kg's of the sample is calculated using the aforementioned average weight of the fish. The estimated quantity traded is 436,721 kg's of sun dried Nile perch and 56,162 for smoked Nile perch. The result of the research and the destinations of the fish are depicted in Table 9. From Table 9 it can be concluded that sun dried Nile perch is exported more than smoked Nile perch. When asked for reasons traders reported that smoked Nile perch is too vulnerable for long distance transport. Also mentioned was that sun dried Nile perch is preferred by consumers in Zaire. The destinations are depicted in percentages in Figure 2.

Table 9. Quantities and destinations of processed Nile perch in July 1992.						
Destinations	Sun dried Nile perch			Smoked Nile perch		
	Quantity of sample: 415,925 Estimated quantity: 436,721			Quantity of sample: 54,002 Estimated quantity: 56,162		
	Pieces	kg's	%	Pieces	kg's	%
Mwanza district	-	-	-	14,636	21,954	41
Mwanza region	12,514	31,285	8	1,050	1,575	3
Shinyanga region	-	-	-	14,850	22,275	41
Tanga region	32,944	82,360	20	1,329	1,994	4
Dar es Salaam	25,264	63,160	15	-	-	-
Mtwara region	30,021	75,052	18	-	-	-
Tabora region	-	-	-	1,543	2,315	4
Zaire	65,627	164,068	39	2,593	3,889	7
Totals	166,370	415,925	100	36,001	54,002	100

The fish is transported by road and/or sea depending on the location. Mwanza market generally is supplied by wheelbarrel or bicycle. Mwanza district, Shinyanga region, Tanga region, Dar es Salaam, Mtwara region, Tabora region, and Zaire are supplied by truck or pick-up. For the latter five alternative routings have also been found. The fish is transported by wheelbarrel, truck, or pick-up to Mwanza railway station. From there the train transports the fish to Shinyanga, Tanga, Dar es Salaam, Tabora, or Kigoma. Once the fish is in Dar es Salaam it can be distributed onwards to Mtwara by truck, pick-up, or sea. Zaire is reached mostly by transporting the fish from Kigoma over Lake Tanganyika to Zairian ports.

Figure 2.

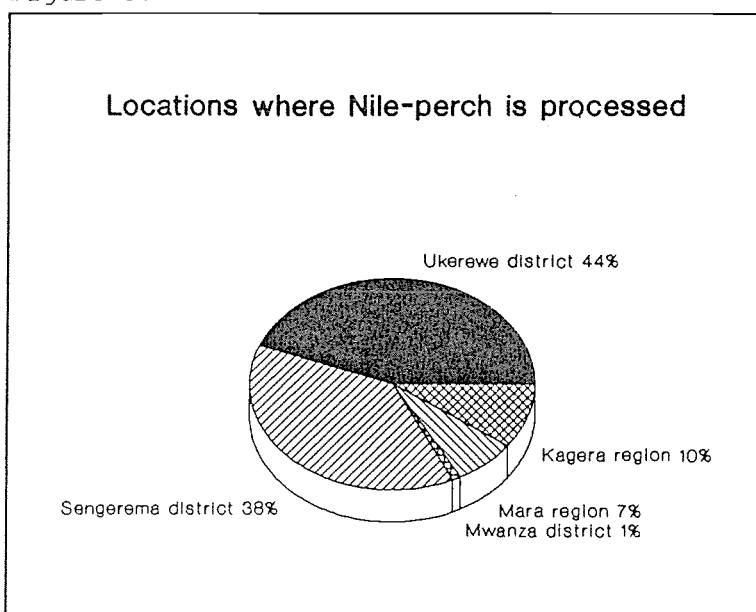


The selling prices used for determining the turnover of smoked and sun dried Nile perch are Tshs. 165 (medium sized smoked Nile perch) and Tshs. 230 (average of the wholesale prices for big and small sun dried Nile perch). Retail selling, which is rare, is not taken into account. The estimated turnover of smoked Nile perch is Tshs. 6,177,820 or US\$ 15,445. The margin is Tshs. 15 per fish. This means that the total estimated margin is Tshs. 561,620 or 1,404 US\$. The estimated turnover of sun dried Nile perch is Tshs. 40,178,332 or US\$ 100,446. The margin of Tshs 20 per fish is calculated as the average margin of big and small fish. The total margin of the traders Tshs. 3,493,768 or US\$ 8,734. The turnover of processed Nile perch is estimated to be Tshs. 46,356,152 or US\$ 115,890. The margin made by traders of processed Nile perch is estimated to be Tshs. 4,055,388 or US\$ 10,138. The figures are summarized in Table 10.

The fish is mainly processed in Ukerewe and Sengerema district. In Ukerewe district locations often mentioned were Ilugwa Island and Ukara Island. Kome Island and the Uziza area were often mentioned in Sengerema district. By far most of the fish processed in Mara region came from Majita Bay. The exact percentages are depicted in Figure 3. When the traders were asked why there was so little fish processed in Mwanza district they reported not to know the reason. The authors presumed that selling fresh Nile perch fetched a relatively better price. A fishermen interviewed, who was active in processing, did not agree with this argument.

Table 10. Turnover and total margin of processed Nile perch		
	Tshs.	US\$
Smoked Nile perch:		
Estimated turnover	6,177,820	15,445
Estimated margin	561,620	1,404
Margin per kg	15	
Sun dried Nile perch:		
Estimated turn-over	40,178,332	100,446
Estimated margin	3,493,768	8,734
Margin per kg	20	
Processed Nile perch:		
Estimated turnover	46,356,152	115,890
Estimated margin	4,055,388	10,138

Figure 3.



48 % of the traders trade with the same suppliers. When asked for reasons, 48 % reported to find it an easy way of working, 37 % were working on a contract basis, and 15 % were working with relatives. 91% of the processed Nile perch is sold to transporters; 9 % to retailers and consumers. Only 26 % of the traders trade with the same customers. Of these traders 60 % reported to work on a contract basis and for 40 % it was an easy way of working.

3.4 Processed Dagaa

During the market research 90 *Dagaa* traders were interviewed, or 54 % of all *Dagaa* traders. Of the traders sampled, 74 (82 %) were working independently; 16 (18%) were working for a boss or company. The number of days per week traders were working on the market varied strongly. Some were, on average, six

to seven days active on the market, others less than once a week. Trade is in bags varying in weight from 18 to 40 kg's. It was observed that on the market *Dagaa* is put into bigger bags. Traders do this because they are taxed per bag, not for the quantity of fish sold.

Fishermen, who dry the fish themselves, are the main suppliers to the traders. Of the traders nine are active in fishing themselves. The results are depicted in Table 11. The percentages do not sum up to 100 because some traders have different suppliers.

Table 11. Suppliers of processed <i>Dagaa</i> .		
	Number of traders *	% **
Fishermen	79	88
Another trader	11	12
Fishing themselves	9	10

* n=90

Of the traders only 25 % are working with the same suppliers. 40 % of those traders on a contract basis, 40 % because it is an easy way of working, 10 % because the supplier is a family member, and 10 % for other reasons.

Most traders purchase their fish at Mwaloni Kirumba, followed by Ukerewe and Sengerema district (See Table 12). In Table 13 it can be seen that 66 (73%) *Dagaa* traders are also active in other stages of the distribution channel. The main activity is transporting to Mwaloni Kirumba.

Table 12. Locations where <i>Dagaa</i> is purchased.		
	Number of traders	% *
Mwaloni Kirumba	50	56
Ukerewe district	35	39
Sengerema district	13	14
Mara region	4	4
Kagera region	6	7

Table 13. Additional activities of the traders in <i>Dagaa</i> .		
	Number of traders	%
Fishing	9	14
Processing	14	21
Transporting to Mwaloni Kirumba	58	88
Transporting from Mwaloni Kirumba	2	3
Retailing	1	2

The fish is mainly transported to Mwaloni Kirumba by transport boat.

The prices in the various stages of distribution are depicted in Table 14. Retail prices for *Dagaa* are given in kg's, although *Dagaa* is more often sold in little staples. The retail price in Mtwara was Tshs. 200 higher when a kg of *Dagaa* was bought in staples. Remarkable is the high margin retailers make in Mtwara. This can be explained by the fact that the region is hard to reach and has a shortage of landed seafood.

Table 14. Prices (Tshs./kg) of <i>Dagaa</i> in the stages of distribution.							
Ukerewe district	Mwaloni Kirumba		Mwanza market	Dar es Salaam Kariakoo market		Mtwara Central market	
WSBP	WSBP	WSSP	RSP	WSBP	WSSP	WSSP	RSP
49	52	59	75-100	170	200	275	450

The fish is mainly processed in Ukerewe and Sengerema district (See Figure 4). In Ukerewe district 32 % is processed in Ukara and Ramasi. Mchangani is the main location in Sengerema district. Kemondo and Majita in Kagera and Mara region respectively. In Figure 5 the exact locations in the districts and regions are shown.

Figure 4.

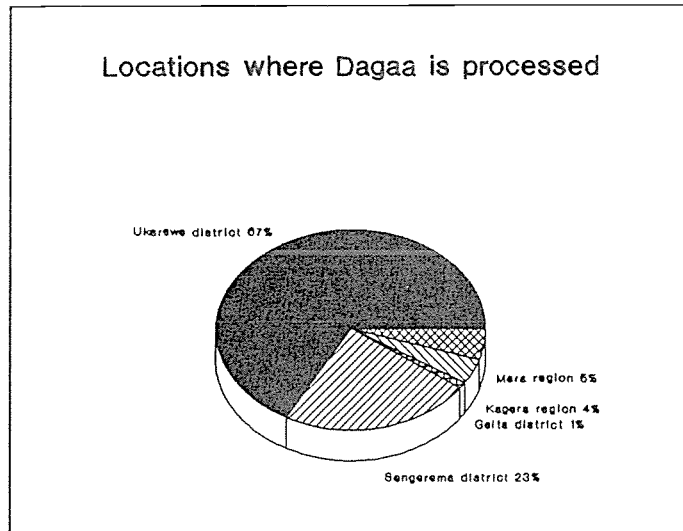
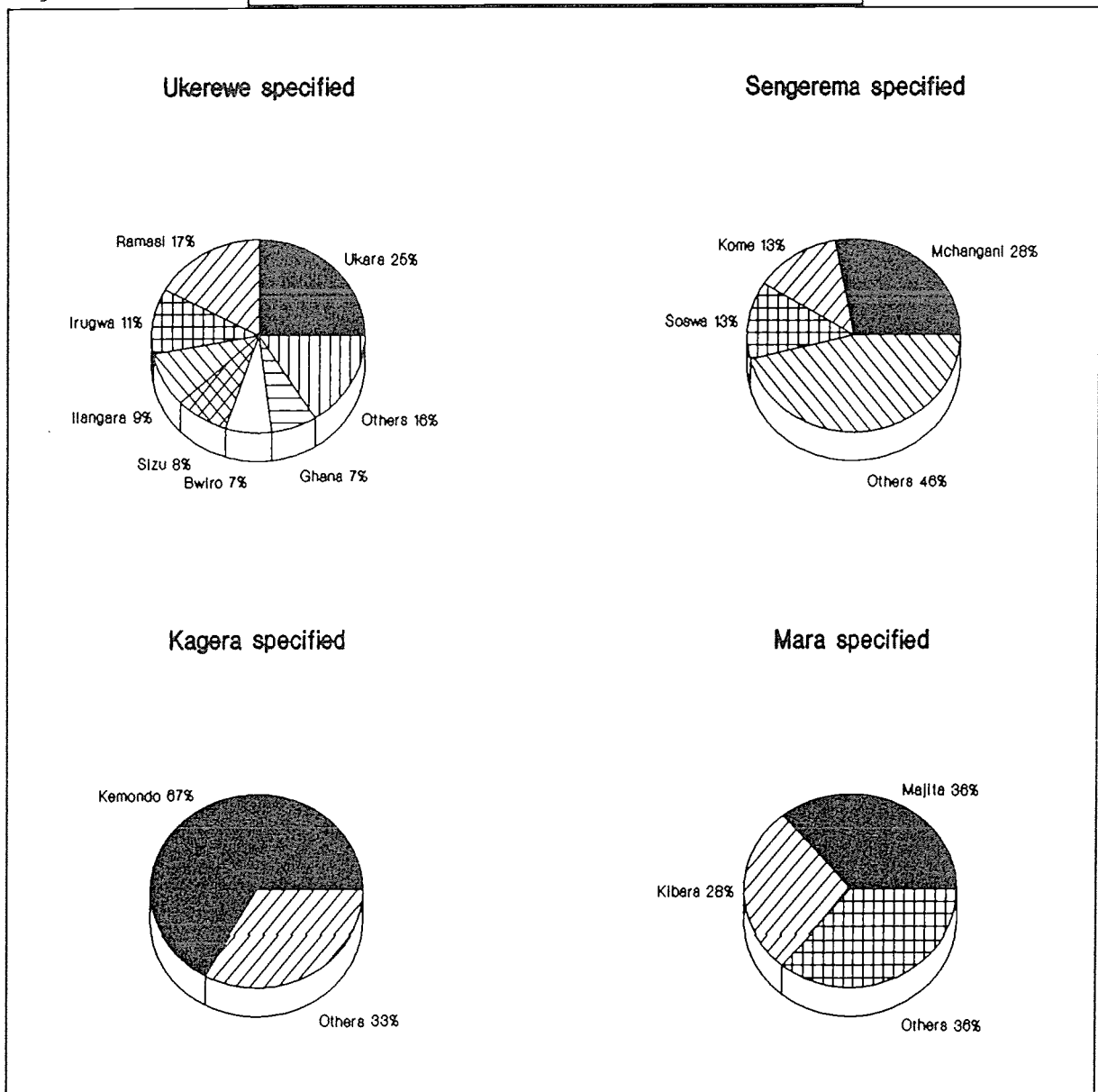


Figure 5.



The quantities and destinations of processed *Dagaa* are depicted in Table 15. The estimated quantity traded for July 1992 is 3,005,846 kg's. The quantity of the sample was 2,690,554 kg's. Of the *Dagaa*, 63% is distributed in Tanzania, 37% is exported. The destination of the exports is mainly Zaire. In Tanzania most of the *Dagaa* is distributed to Dar es Salaam and Mtwara regions. Fish distributed to Dar es Salaam may well partly be exported to Zambia. The percentages of inland distribution and export will, if this is the case, not be entirely correct. *Dagaa* distributed to Mtwara region is not exported to Mozambique, but consumed in the region.

Table 15. Estimated quantity and destinations of <i>Dagaa</i> traded in July 1992	
Estimated quantity	3,005,846
Quantity of sample	2,690,554
Destinations:	
Tanzania	
Estimated quantity	1,893,683
63 % of the trade	
	%
Mwanza region	< 1
Shinyanga region	2
Dar es Salaam region	15
Dodoma region	< 1
Mbeya region	2
Morogoro region	9
Tanga region	5
Ruvuma region	8
Mtwara region	21
Export	
Estimated quantity	1,112,163
37 % of total trade	
	%
Zaire	35
Burundi	1
Rwanda	< 0.5
Zambia	< 0.5
Malawi	< 0.5
Kenya	< 0.5

Of the total traders, only 21% are working with the same customers. 44% have a contract with customers, for 33% it is an easy way of working, 11% works with family, and 22% had other reasons. The fish is mainly sold to transporters (See Table 16). All traders selling to consumers were also selling to other customers.

Table 16. Customers of the traders in <i>Dagaa</i> .		
	Number of traders	% *
Transporter	69	77
Another trader	14	16
Consumer	8	9
Retailer	5	6

* Percentages do not sum up to 100 because some traders have different types of customers

The way the fish is transported to the destinations is described in the section on processed Nile perch. *Dagaa* is distributed the same way as processed Nile perch.

The turnover of *Dagaa* for July 1992 is estimated to be Tshs. 177,344,914 or US\$ 443,362. The wholesale margin per kg is Tshs. 7. The total margin of the traders is estimated to be Tshs. 21,040,922 or US\$ 52,602. The results are depicted in Table 17.

Table 17. Turnover and total margin of <i>Dagaa</i> traders.		
	Tshs.	US\$
Turnover	177,344,914	443,362
Total margin	21,040,922	52,602
Margin per kg	7	

3.5 Summary and recommendations

1. At Mwaloni Kirumba a total of 318 traders are working out of whom 191 were sampled. Traders can be divided in three categories, namely, cooperative licence holders, individual licence holders, and non-licence holders.
2. The traders not sampled are small traders, who are not very often on the market. In the case of processed Nile perch, officials reported that the traders go where the trade is best.
3. The total market turnover for July 1992 is estimated to be US\$ 606,279, total margin US\$ 69,649. Fresh fish has the lowest market turnover, 8% of the total market turnover. The turnover of processed Nile perch is 19% of the total turnover. *Dagaa* has the highest turnover, 73% of the

total market turnover. A high percentage of the turnover is earned by a small number of traders.

4. During the marketing study only four species, Nile perch, Tilapia, *Dagaa*, and Protopterus were traded.
5. Sampled fresh fish traders (44 in number) are, except one, not active in other stages of the distribution channel. The total number of fresh fish traders is 65. Of the traders sampled, 86% was active in trading Nile perch. Nile perch is, with 95% of the total fresh fish trade, traded most. Eight traders, all agents, are responsible for 70% of the trade in this fish. The agents export the fish to Kenya. The margin per kg is Tshs. 7.5 for the agents and Tshs. 20 for the other traders. All fresh fish is harvested in Mwanza and Sengerema districts.
6. Processed Nile perch traders (87 in all) are also active in the other stages of distribution. 82% of the traders are trading sun dried Nile perch. Sun dried Nile perch accounts for about 87% of the trade in processed Nile perch and is distributed further than smoked Nile perch. Reasons for this are the vulnerability of smoked Nile perch and consumer preferences, especially in Zaire. 39% of sun dried Nile perch is exported. For smoked Nile perch this percentage is lower, namely, 7%. 82% of the fish is processed in Ukerewe and Sengerema districts.
7. Processed *Dagaa* is the most important commodity in the market. There are 166 traders active in trading this species. Traders in *Dagaa* are for 73% active in the other stages of distribution. 90% of the fish is processed in Ukerewe and Sengerema districts. 37% of the fish is exported, mainly to Zaire. For processed *Dagaa* and Nile perch the export figures may be higher, because fish transported to Dar es Salaam may partly be exported to Zambia by rail. It was observed that traders put the fish in bigger bags before transport because they are taxed per bag.
8. 53% of the fresh Nile perch is harvested in Mwanza district, followed by Sengerema district, where 47% is harvested. Tilapia and Protopterus are only harvested in Mwanza district, Protopterus specifically in the area of Irunda Island. Fresh *Dagaa* is harvested in Sengerema district. The locations where most Nile perch traded at Mwaloni Kirumba is processed are Ukerewe and Sengerema districts (44 and 33%). 67% of the *Dagaa* is processed in Ukerewe district, followed by Sengerema district with 28%.
9. Of the processed Nile perch, 17% is processed in Kagera and Mara region. For *Dagaa* this percentage is 9. It is remarkable how small this percentage is. Reasons may be the low production in Kagera and Mara region of processed Nile perch and processed *Dagaa*, a misconception on the national importance of Mwaloni Kirumba as a market where a high percentage of processed fish harvested in the three regions is traded, or constraints in the distribution channel from the regions to Mwaloni Kirumba. When looking at the destinations of the market it can be concluded that the market is of high importance for Tanzania. The fish is distributed nationwide and exported.
10. Traders in fresh fish trade with different suppliers. However, for processed Nile perch 48% of the traders are trading with the same

suppliers, while for *Dagaa* it is 25%. The customers of fresh fish traders are, except for agents, not the same. For processed Nile perch and *Dagaa* traders, the percentages are lower than in the case of suppliers, 26 and 21%.

11. The traders in fresh *Dagaa* and *Protopterus* are active in retailing. The traders in fresh Nile perch and Tilapia are active in retailing and wholesaling. Trade in processed Nile perch and *Dagaa* is mainly wholesale.
12. It is recommended not to allow illegal traders to operate at Mwaloni Kirumba, since these traders do not pay the Mwanza Municipal for operating on the market, while using the market's facilities.
13. It is recommended to support further investigations into the reasons why only a small percentage of processed fish traded at Mwaloni Kirumba are harvested and processed in Kagera and Mara region.

The summary of the results are depicted in Table 18.

Table 18. Summary of the results of the marketing study.				
	Fresh fish	Processed Nile perch	<i>Dagaa</i>	Totals
Population of traders	65	87	166	318
Sample of traders	44	57	90	191
Units in which traders trade	Pieces <i>Dagaa</i> : Tins	Whole fish	Bags 18-40 kg	-
Estimated quantity traded in kg	234,347	492,883	3,005,846	3,733,076
Quantity of sample in kg	224,893	469,927	2,690,554	3,385,374
Turnover/US\$	47,027	115,890	443,362	606,279
Total margins/US\$	6,909	10,138	52,602	69,649
Fish harvested in Mara and Kagera region as percentage of the total trade in fish at the market	0	17	9	
Trading with the same suppliers	0%	48%	25%	
Trading with the same customers	Only agents	26%	21%	
Type of trade	Wholesaling/ retailing	Wholesaling	Wholesaling	

4. THE EXPORT MARKET FOR FRESH FISH AND FILLET

4.1 Introduction

Fish exported from Lake Victoria are *Dagaa* and Nile perch. Nile perch is the only commodity in the export market for fresh fish and fillets. *Dagaa* is only exported sun dried.

At the moment Tilapia is not exported. Two companies are considering exporting whole, frozen Tilapia to Europe. In the opinion of the researchers this is not likely to happen because the price of Lake Victoria Tilapia would be too high on the world market. Tilapia can be purchased at lower prices in Asia. Furthermore, most exporters are reluctant to export the fish because of the low availability and local preference in Tanzania.

Nile perch is exported in a number of ways: fresh, chilled, skin-on fillet and packed, frozen fillet. Currently most exports are of fresh fish. The main destination of Nile perch is Kenya, where there is a shortage of landed fish, due to the operation of over twenty processing plants. The fish is exported by Tanzanian export licence holders, who either have a contract with a Kenyan company or sell to the highest bidder. Transport is by road with rented or company owned trucks.

The composition and volume of exports will substantially change in the near future, since thirteen processing plants will have started exporting fillet by July 1993. Fresh fish exports are likely to decrease since some Kenyan processing companies have started joint ventures with Tanzanian exporters. The exporters network for obtaining fish will be used to supply the new Tanzanian plants. Other, mostly smaller exporters expect to continue exporting.

4.2 The companies

At the time of the field visit fifteen Tanzanian companies were active in exporting fresh or filleted Nile perch. In order to export Nile perch the companies must have an export licence from the Fisheries Department. Each time an export licence holder wants to export, permission must be given by the Regional Fisheries Officer.

Of the companies, thirteen are active in trading/exporting and two in processing/exporting.

4.2.1 The trading companies

The companies have found a market in Kenya because of the shortage of landed fish and higher prices there.

During the interviews the respondents were asked if there was any form of cooperation between them, like charging the same price to fishermen and processing companies or sharing transportation facilities to save costs. None of the respondents knew of any form of cooperation, and no respondent was expecting this to happen in the future. The competition in the market was reported to be too high to make cooperation possible. The fish are purchased through an often widespread network, including contracted fishermen, collection vessels, trawling companies, agents and fishmongers. Generally one or two landing sites are chosen as collection points for the fish. Trucks,

which are refrigerated or contain ice are waiting at the collection points where fish is landed by fishermen and by collection vessels. When the supplying is completed the truck leaves for Kenya. If the trader takes care of the transport, because he owns or rents trucks, the payment is in Kenyan Shillings when arriving at the plant. If the Kenyan company is responsible for the transport, the trader is paid in Tanzanian Shillings when the truck leaves for Kenya.

The net profit for a trader selling free on board Mwanza normally ranges from Tshs. 35,000 to 45,000 per truck of five tons. Should the trader take care of the transport to Kenya the net profit increases to between Tshs. 60,000 and 110,000 per trip depending, among others, on spoilage during transportation and whether he owns or rents the truck.

The near future will bring substantial changes. Seven trading companies will stop exporting to Kenya (and in one case to Burundi) and start supplying new Tanzanian processing companies in which they are partners. This will reduce exports to Kenya by about 80%. The remaining six companies have reported that they will continue exporting. They are considering contracts with Kenyan companies not active in Tanzania, putting up joint ventures for small scale filleting or exports of whole, frozen Nile perch to developed countries. According to the information given to the authors, exports of whole Nile perch are economically not viable. On the matter of small scale processing, it can be said that the quantity produced will, probably, not be high enough to match the high investments needed to meet the quality standards of Western markets. To continue exporting whole fish seems to be the only alternative for the traders.

4.2.2 The processing companies

By July 1993 thirteen plants will be operational in Tanzania. In aggregate the plants will represent a huge yearly freezing capacity of 308 tons of fillet daily.

The respondents reported the stock of Lake Victoria, especially in Tanzania, to be high enough and did not express concern in over-exploitation of Lake Victoria. The reason for this may well be that the companies, once into operation, earn back the investment in the plant in one to two years and therefore have not much concern on how the situation of Lake Victoria will be in the future. The supply of fish could, according to the respondents, only be too low due to lack of fishing effort, a shortage of fishermen, or a shortage of gear. This is why the companies put a lot of effort in contracting fishermen and are considering going into fishing with company owned boats. The fear of lack of fish supply and higher control on the quality of the fish are the reasons for backward integration in the market.

None of the respondents expected cooperation as reported in 4.2.1. The only form of cooperation reported to exist is using the competitors marketing channel.

Most companies are joint ventures between Tanzanian and Kenyan, European, Australian, Israeli, or American businessmen. The reasons for Kenyan businessmen, already active in processing in Kenya, come to Tanzania are the lower prices and higher availability of fish in Tanzania. Furthermore it saves costs to transport frozen fillets. Fillets are 33 % of the weight of whole fish, are transported without ice and have no spoilage during transportation.

Reasons in general to invest in Tanzania are the high global demand for white fish and the Tanzanian Investment Code. The Tanzanian Investment Code describes, among others, the conditions under which private investments can be made in Tanzania. The Code makes it attractive for foreigners to invest in Tanzania.

The joint ventures are likely to be successful because both parties depend on each other. Foreigners are needed for funding, technical knowledge and the marketing of the product; Tanzanians are needed because they know the fishermen, area and the Tanzanian way of doing business.

The investment in a plant ranges from 0.5 to 1 Mln. US\$ Before going into operation the investment may amount up to between 1 and 2 Mln. US\$ This amount varies, among others, with the additional investment made in means of transportation, the type of fishing and training of the staff.

During an interview with a respondent an estimation of two break-even points was made. A break-even point was defined to be the situation where at a certain buying price of Nile perch or at a certain capacity used the profit of the company was zero. When assuming that the company operated at 80% of the capacity (normal capacity) the respondent estimated the company to break-even at a buying price of fish between Tshs. 200 and 350. When assuming a buying price of Nile perch of Tshs. 80 per kg the respondent estimated the company to break-even at a capacity between 30 and 40 % of the maximum capacity. From these figures and the assumptions depicted in Table 19 the gross profit is estimated (conservatively) to be around US\$ 3.2 Mln. In Appendix 5 it can be seen that the company has relatively high fixed costs. The reason for the high profit is that the company breaks-even at a low capacity, while it has high fixed costs. The company breaks-even at a low capacity because of the difference in buying and selling price of Nile perch. For producing one kg of fillet, US\$ 0.6 is spent on Nile perch, while the selling price is around US\$ 2.9.

Table 19. Profit of an average processing plant.
Assumptions:
* Selling price per kg of fillet US\$ 2.9
* Current price per kg Tshs. 80 = US\$ 0.2
* Break-even price Tshs. 200 = US\$ 0.5
* Break-even quantity 40 % of the capacity
* Normal capacity 80 %
* Conversion factor 33%
* Capacity average company 15 Tons daily
* Days of production 300 (Electricity break-down, Problems with machinery, etc.)
* Enough fish supply
Estimated gross profit US\$ 3,240,000 Mln.

Most of the plants have invested or are planning to invest in fish-meal plants to process the left-overs of filleting. If the capacity of the fish-meal plant is not fully used, *Dagaa* will be purchased to achieve full capacity.

The subsequent stages of processing Nile perch are depicted in Table 20.

Table 20. Subsequent stages of processing Nile perch		
1.	Selection.	If the fish arriving at the plant is in good condition it is used for filleting. Should the fish not meet the standards it is used for fish-meal or the possibilities earlier mentioned.
2.	Washing.	With chemical substances, to assure that the fish is filleted with a minimum of bacteria. This is done by hand, since mechanical filleting is very difficult because of the round form of the fish.
3.	Filleting.	Removing the skin of the fish. Depending on consumer preferences this is done manually or mechanically.
4.	Skimming.	Removing belly together with any remaining bones.
5.	Trimming.	In chemical substances and subsequently in cold water to clean the fillet from the chemicals.
6.	Washing.	According to weight.
7.	Selection.	The fish achieves the storage temperature in a short period of time.
8.	Packing.	At a temperature between minus 25-30 degrees.
9.	Blast-freezing.	
10.	Storage.	

After processing one kilo of Nile perch, 300 to 350 grams of fillet is left over. The average conversion factor in Tanzania is 33 %.

The companies will work in different shifts. Mentioned were 3 times 8 hours and 2 times ten hours. One company reported to work 12 hours daily.

All processing companies will work with artisanal fishermen. Some consider artisanal fishing with company owned boats, trawling, or cold storage facilities in other regions, especially if the fish supply does not meet the plant's normal capacity.

The companies encounter quite a few problems before going into operation. Among these problems are:

- * Difficulty in obtaining electricity and telephone connections and poorly functioning connections once operational.
- * Lack of proper building materials.
- * Lack of skilled labour forcing the companies to have specialists coming from Kenya or overseas.

During the interviews the respondents expressed concern about the following issues:

- * The bad condition of the roads in Tanzania impeding transport via the port of Dar es Salaam.
- * The operation of the Tanzanian Railways. Companies are, due to lack of confidence in the operation of the railway, reluctant to transport by rail. Using the rail would save costs.
- * The bad condition of the fish when arriving at the plant. Companies will have to make additional investments in training the fishermen in proper fish handling.

The marketing of the commodity is in most cases done by mother or sister companies. One company failed to give a clear picture on how the marketing will be done. It was found that some other companies have not sufficiently invested in assuring the supply of fish and the marketing of the fish.

All the companies will be marketing the fish maws (See appendix 6). The marketing possibilities of Nile perch are depicted in Table 21 and the method of marketing in Table 22.

Table 21. Marketing possibilities of Nile perch.	
Fillet	1. For consumption.
Gills	1. For consumption.
Maws	1. For consumption. 2. Used in brewing industry. 3. Used in detergent industry.
Guts	1. Used for the extraction of oil. 2. Used in chemical industry. 3. Used for the production of fish-meal.
Skin	1. Used for making leather.
Bones	1. Used for chemical extractions. 2. Used for the production of fish-meal.

Table 22. The marketing of the commodity.	
Method of marketing:	Number of companies:
Using contacts of competitors.	1
Using contacts of mother/sister company.	5
Marketing done by company.	4
Only one customer who does the marketing.	2
Not clear.	1

4.3 Distribution channels

Figure 6 gives an overview of the distribution channel used by companies with export licences. Starting point of Figure 6 is the type of fishing which can be artisanal or trawling. Companies either own a trawler or purchase the fish from a trawler company. Artisanal fishing can be done by the company contacting fishermen, employing fishermen, or by fishermen working independently.

To assure the supply of fish and gain control of the quality of the fish, most companies try to contract the fishermen, meaning that the fishermen commit themselves to supplying only the company. To get the fishermen to work for the company, various incentives are given. Among these are:

- * Loans to fishermen to enable them to improve the quality of their gear. The loans are to be paid back in kind;
- * Advancing money before the fish is harvested;
- * Providing engines and nets, to be paid back in kind; and
- * Providing ice or ice containers without cost.

The harvest is transported to the companies private landing site or a public landing site. A company owned collection vessel sometimes collects the fish directly from the harvesting area to transport it to the private landing site. On the public landing site the fish is purchased or collected by an agent or fishmonger and transported to the company. It also happens that the fish is purchased or collected directly by the company truck or collection vessel. The way of collecting the fish varies from company to company depending on financial strength and strategy. Smaller companies often lack the funds to contract the fishermen or purchase a collection vessel and work only with fishmongers, independent fishermen and transporters. Bigger companies may use all the possibilities of obtaining the fish. The ways that companies obtain and distribute the fish is depicted in Table 23. The second part of Table 23, the future situation, is based on how the companies are planning to work in the future. The distribution from the plant in Tanzania and to the plant in Kenya is done by truck, the fillet is transported via Mombasa port. Respondents are considering or have decided to transport via Dar es Salaam in the future.

There is hesitation because of poor functioning of the railways and bad road conditions. Tanzanian processors want to use rail since this form of transportation is 25 % of the cost of transporting by road, but they find it too risky at the moment. Two processors are considering air transport when in operation. Most respondents rejected this as too expensive.

The destination of the fish processed in Tanzania is given in Table 24.

Figure 6. The distribution channels.

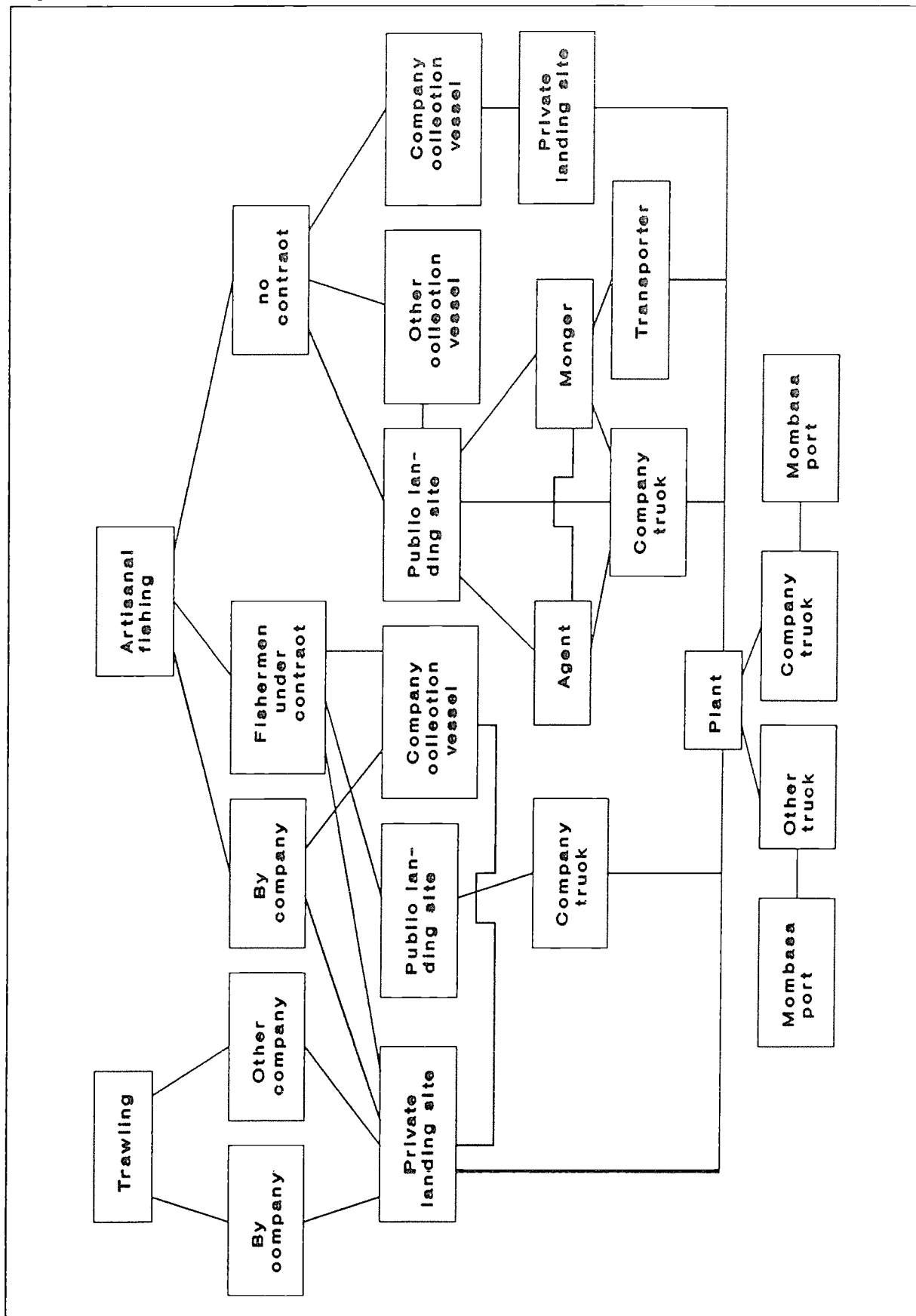


Table 23. Ways of obtaining and distributing the fish.				
Present situation(PS) : 13 Traders/exporters 2 Processors/exporters				
Future situation(FS) : 6 Traders/exporters 13 Processors/exporters				
	PS		FS	
	NOC*	%	NOC*	%
<i>Collecting the fish:</i>				
Working with fishermen under contract	10	67	14	74
Working with independent fishermen	7	47	8	42
Working with a company owned fishing boat	1	7	4	21
Working with a company owned trawler	-	-	5	26
Working with a trawler company	4	27	4	21
Having private landing site	4	27	11	58
Working with a company owned collection vessel	5	33	9	47
Working with an agent	5	33	10	53
Working with fish monger	5	33	6	32
Working with transporter	2	13	2	11
Working with company owned truck/pick-up	4	27	6	32
<i>Distributing the fish:</i>				
Company owned trucks	1	7	9	47
Other trucks	15	100	14	74
Rail	-	-	3	16
Air	-	-	2	11

* Number of companies.

Table 24. Destinations of fillet produced in Tanzania.		
Destination:	in %	tons
Europe	75	2520
Israel	13	437
Australia	8	269
USA/Japan	4	134
Totals	100	3,360

The eleven processing plants yet to be opened are planning to export to the countries given in Table 25. Three companies have not made a statement and three companies reported planning exporting to more than one country. This is why in Table 25 the second column sums up to fourteen instead of eleven companies.

Table 25. Planned destinations of fillet of the plants yet to be opened.	
Destination:	Number of companies*
Israel	4
Europe	2
Japan	2
Australia	1
World wide	1
Tanzania	1
Not clear	3

* N=11

4.4 Prices, quantities and capacities

4.4.1 Prices

Prices per kg of Nile perch are difficult to determine since trading is often in whole fish. A trader assesses the total catch and offers a price per fish head, or prices are set per fish head and will only change if the fish is very small or extremely big. During the field visit respondents were asked to estimate the price per kg. The prices in Table 26 are the estimates of the price per kg of the traders.

Table 26. Prices (Tshs./kg) ex-vessel of Nile perch in the different regions.				
Region	Small landing site		Big landing site	
	Price range*	Price**	Price range	Price
Kagera	30-50	40	40-70	60
Mwanza	40-70	50	60-120	80
Mara	60-100	65	60-120	70

* The price range is the lowest and highest price paid by the companies last year.

** Prices include fees for agents, who receive Tshs. 5 to 10 per kg and exclude repayments of loans or other forms of incentives given to the fishermen.

The prices paid for Nile perch depend upon a number of variables:

1. The demand for fish at the various landing sites.
Kagera region has the lowest demand and subsequently the lowest price because the region is difficult to reach by road. In Mwanza and Mara region prices are similar on the bigger landing sites. On the smaller landing sites Mara region is more expensive, due to the possibility of exporting fish undeclared to Kenya (See 4.6).
On the landing sites which are difficult to reach (Landing sites on the islands) the demand is lower, mainly because the trucks cannot reach the landing site. Traders who buy fish at these landing sites own a collection vessel and take the fish to the bigger markets, taking advantage of the price difference.
2. The supply of fish at the various landing sites depends on the following:
 - * the season;
 - * the spoilage of the fish; and
 - * the availability of gear.

The fluctuation of prices is higher at the bigger landing sites, especially in Mwanza region, due to stronger changes in demand. If several trucks are waiting to collect the fish the price goes up very fast. Prices paid to fishermen and trawler companies under contract tend to be somewhat lower than the market price.

The prices the trading companies receive from the Kenyan companies depend on the season and the way the transport is arranged. Companies providing fish with a truck not belonging to the Kenyan processor are paid around Kshs. 5 more per kg of fish delivered. The received price ranges from Kshs. 12 to 15 for companies transporting with a truck owned by a Kenyan company to 17 to 20 for companies using their own or hired trucks. The average price during the field visit was Kshs. 14 and 19 respectively.

The processing companies prices received free on board Mombasa are in the range of US\$ 2.5-2.8 for Israel and US\$ 2.7-3 for other countries.

4.4.2 Quantities

The quantity of whole fish exported by road is 1535 tons per month, 18,420 tons yearly of which 18,060 tons are exported to Kenya and 360 tons to Burundi.

The two processing companies operational at the moment export their fish to developed countries, using the port of Mombasa. Last year, taking into account that one of the companies started operating only recently, the companies exported 3,360 tons of fillet or, taking the average conversion factor of 33 %, 10,080 tons of whole fish. For the total of declared exports see Table 27.

Table 27. Declared exports in whole fish, 01-07-91 - 30-06-92	
	Tons
Export of fillet 3,360 tons, in whole fish	10,080
Declared export of whole fish	18,420
Total declared export	28,500

4.4.3 Capacity of the processing plants

The bottleneck for the processing plants, assuming sufficient fish supply, is the daily freezing capacity, which is therefore considered the maximum capacity of the plant. The joint capacity of the two plants in operation is 30 tons of fillet per day, 10,800 tons yearly. Converted into whole fish 32,400 tons.

By July 1993 eleven plants will come into operation, making a total of 13 processing plants in Tanzania. The joint daily freezing capacity of the plants will be 308 tons per day, yearly 110,880 tons. Converted into whole fish 332,640 tons.

4.5 The three regions

4.5.1 Kagera region

In Kagera region three export licence holders were visited. Two of them were trying to get into contact with a Kenyan processing plant to be able to export whole fish. Currently they are only involved into nationwide distribution. The problems the export licence holders encountered in their attempts to export to Kenya are:

- * Kenyan companies feared the availability of fish in the region. This is due to lack of ice plants causing up to 50 % spoilage of the total catch and impeding fish transports by collection vessel over longer distance. Furthermore there is shortage of fishing gear in the region, especially due to theft.
- * Kenyan companies are reluctant to send trucks to the region because of the extremely bad road conditions.

The only export licence holder active is Rweyemamu, who recently started cold storage facilities in Bukoba and is planning to construct a processing plant with a high freezing capacity.

A problem facing Kagera region is the shortage of value-added economic activity. Most future processors in the two other regions consider opening cold storage facilities and building up a network to obtain fish in Kagera region, but the actual processing will be done in Mwanza or Mara region.

4.5.2 Mwanza region

In Mwanza region 11 trading and one processing company are presently operational. The region is the most active region in fish exporting, accounting for 15,820 tons yearly in whole fish. In the near future the importance will increase because seven additional processors will start

operations. New processors reported to invest in the region for the following reasons:

- * The central position, enabling processors to collect fish lake wide;
- * Knowledge of the region by the trading companies who are to form part of the processing companies;
- * Faster access to spare parts in case of a defect at the plant; and
- * High availability of fish.

The main problem facing the region is the high capacity of the plants. Artisanal fishermen will initially take advantage of the situation by increased prices. Mwanza gulf, however, has a high risk of being overexploited, impeding a sustainable income for the artisanal fishermen.

4.5.3 Mara region

At the moment three companies are active in the region, two trading companies and one processor. The trading companies have put up joint ventures and will in the near future provide their own companies with fish. One trading company, at the moment based in Mwanza will also begin processing making a total of four for the region.

The main problem facing Mara region is the undeclared export of fish across the Lake. These exports may increase since Kenyan companies will receive less fish over the road, unless the prices in Tanzania will, due to increased demand, be near Kenyan prices.

4.6 Undeclared exports

Because of the difference in price between Kenya and Tanzania, fishermen harvesting near the Kenyan border often sell the fish directly to Kenyan traders. Through this the fishermen avoid the Tanzanian export license holders (and customs), enabling them to get a better price. The fishermen can enter Kenyan waters to sell their fish or Kenyan collection vessels can come into Tanzanian waters to purchase the fish. Kenyan collection vessels have been spotted as far as Lukuba (an island near Mara bay).

The trading is in whole fish and Kenyans generally buy the entire catch. During the field visit, they were paying Tshs. 400-450 per fish. The Nile perch harvested weigh, on average, 5 kg, meaning that the prices range from Tshs. 80 to 90 per kg. The prices received by the fishermen during the time of the field visit ranged from Tshs. 65 to 70 per kg. Calculated roughly the extra profit received by selling directly to Kenyans ranges from Tshs. 10 to 25 per kg.

The respondents interviewed in Mara region estimated the amount sold daily to Kenyans to be in the range of 5-6 tons. One respondent reported he hardly ever received fish harvested north of Musoma any more. The respondent used to receive 6 tons daily. Undeclared exports over Lake Victoria are estimated to be 5.5 tons per day, yearly 1980 tons.

The second possibility for undeclared exporting is by road. The respondents were of the view that more fish is exported through this channel than by sea, estimating the figure to be 50-300 tons per week. Since the authors had the

impression that the export licence holders stated exports of fish quite correctly, undeclared exports by road are estimated conservatively at 100 tons per week, 5200 tons per year. In Kagera region, where Tanzania borders Uganda, no exports of fresh Nile perch were found.

In table 28 total yearly exports, declared and undeclared, are given.

Table 28. Total yearly exports of Nile perch in whole fish.		
	Tons	%
Export of fillet 3,360 tons, in whole fish	10,080	29
Declared export of whole fish	18,060	51
Undeclared export by lake	1,980	5
Undeclared export by road	5,200	15
Total export	35,320	100

4.7 Summary and recommendations

1. The estimated exports of fresh and filleted Nile perch, for the period of July 1991 to July 1992, are 25,240 and 3,360 tons. Fresh fish is exported to Kenya and in one case to Burundi. The fillet is for 75% exported to Europe, followed by Israel where 13% is exported. It is likely that in the future a much higher percentage will be exported to Israel.
2. At the time of the field visit thirteen companies were active in trading/exporting and two in processing/exporting. In the future there will be six traders/exporters and thirteen processors/exporters.
3. The composition of Nile perch exports will change substantially, since thirteen processing companies will be operational by July 1993. Furthermore, seven of the companies who were exporting whole fish will stop this activity and will start supplying the processing plants in which they are partners. The processing companies will have a yearly freezing capacity of 110,800 tons.
4. Companies earn back the investment made in a short period of time, one to two years, and will therefore not have a high concern for future over-exploitation of Lake Victoria. The estimated profit of a Tanzanian processing company is more than US\$ 3 Mln., assuming, among others, sufficient fish supply.
5. Most companies are joint ventures between Tanzanian and Kenyan, European, Australian, Israeli, or American businessmen.
6. The companies reported the competition to be strong. The respondents did not expect much cooperation. One company will be using the marketing channel of a competitor.

7. The marketing of the commodity will in most cases be done by the mother or sister company. It was found that some companies have not given much attention to the marketing of the fish.
8. All processing companies will work with artisanal fishermen. Some consider artisanal fishing with company-owned boats, trawling, or cold storage facilities in other regions, especially if the fish supply does not meet the plant's normal capacity.
9. Problems and concerns expressed by the companies were: (a) Poorly functioning infrastructure (telephone connections, road conditions, operations of the Tanzanian railway), (b) Lack of skilled labour forcing the companies to have specialists coming from Kenya or overseas, (c) The bad condition of the fish when arriving at the plant.
10. The companies integrate or are planning to integrate backwards to assure the quality and availability of the fish. Backward integration happens when companies try to contact the fishermen or go into fishing themselves (artisanal or trawling).
11. Problems facing the three regions are:
 - * Mwanza: risk of overexploitation;
 - * Kagera: a shortage of value-added economic activity; and
 - * Mara : undeclared exports.
12. Exporting the fish undeclared can happen by road (trucks, not or under declaring) or Lake (Kenyan collection vessels coming into Tanzanian waters or Tanzanian fishermen selling in Kenyan waters). Undeclared exports are estimated to be 7180 tons yearly.
13. Since figures on Maximum Sustainable Yield for Lake Victoria are dated it is recommended to strongly support initiatives for a renewed estimation on Maximum Sustainable Yield and following form this figure an estimation on Maximum Economic Yield.
14. It is recommended not to allow new processing companies to start operations in the regions of Lake Victoria until Maximum Sustainable Yield has been estimated, enabling the Tanzanian government to asses the future situation of Lake Victoria fisheries.
15. Because of the poorly functioning operations of the railways and the poor road conditions companies hesitate or refrain from distributing the fillet via the port of Dar es Salaam. To change this situation it is recommended to improve the quality of the operations of the Tanzanian railways and the poor road conditions.
16. Artisanal fishermen will, in the short term, take advantage of the future situation, because all the companies will be working with them. Should, however, the fish supply not meet the normal capacity of the plants, the companies consider going into artisanal fishing or trawling, threatening longer-term income of the fishermen. To protect the longer-term income of the fishermen it is therefore recommended to ban trawling from the Tanzanian part of Lake Victoria.

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APPENDIX 1

TERMS OF REFERENCE

MARKETING STUDY

1. Introduction

The fisheries of Lake Victoria have changed substantially since the proliferation of Nile perch. Intense discussions have taken place on the ecological and economic impact of the Nile perch. Economically it seems beyond doubt that the Nile perch has brought increasing earnings to the fisherfolk. From the nutrition point of view, the riparian populations, after some initial reluctance, came to benefit greatly from this new fisheries.

However, the increasing production and benefits involved a growing number of entrepreneurs and industrial firms. This threatened the position of small scale processing and trading (mostly done by women) and from there the supply for local marketing and consumption. On the other hand, large scale industrial processing and marketing in Tanzania has not developed as it did in Kenya, presumably because of distribution and marketing system constraints (Reynolds and Greboval, 1988). It is this system in Tanzania which needs to be studied in order to provide essential information for planning and management of the Tanzanian fisheries.

2. Framework

In the context of the Regional Project for Inland Fisheries Planning, Development and Management in Eastern/Central/Southern Africa (IFIP) and in collaboration with the Tanzanian Fisheries Research Institute (TAFIRI), the researcher will undertake a socio-economic study of the marketing structure in Lake Victoria fisheries. The research will focus on two markets. Firstly, a major market situated near Mwanza. The research will provide for an assessment of marketing structures, quantities and prices, margins and destinations. Secondly, the research will provide for an assessment of exports of fresh and filleted fish from Lake Victoria and a description of the activities of the fish processing plants situated in Tanzania.

3. The researchers

The IFIP researcher should be majoring in socio-economics and/or development economics (or in a related field like sociology or anthropology with an orientation on economics) with a background in marketing. Working knowledge of English is required. Knowledge of Swahili would be an advantage. Working experience in developing countries will also be desirable. The TAFIRI researcher is expected to have sound knowledge of fisheries research, particularly on Lake Victoria fisheries.

4. Logistics

One of the main trading centres in Tanzania for local marketing as well as for export oriented large scale trading is Mwaloni Kirumba in Mwanza. From here the fresh or processed fish is transported to local markets in the region, to Dar es Salaam as well as f.e. to Zaire and Kenya markets. The market for fresh

fish and fillet is around the Lake, but most companies are situated in Mwanza. Therefore the IFIP researcher will be based in Mwanza. The Tanzanian Fisheries Research Institute (TAFIRI)-Mwanza branch will be approached to nominate a counterpart researcher and to supply the researchers with minimal logistical support. A field visit by the IFIP supervisor is foreseen at the beginning of the study.

5. Proposed timeschedule

The fieldwork is expected to take place over a period of three months. The researcher is expected to report back to IFIP headquarters in Bujumbura after the fieldwork, for report finalizing.

6. Output

The report following from the study would be published in the IFIP series of technical documents/working papers. It is expected to contain a description of background and methodology of the study, research results from the fieldwork, conclusions and recommendations.

APPENDIX 2

QUESTIONNAIRE TRADERS

Questionnaire Traders

This questionnaire is designed to broaden our insight of the market into which you are operating. The information you give will be treated as confidential.

1. What is your nationality?
 2. Do you work for yourself?
yes -> 4. no -> 3
 3. Who do you work for?
 - a boss -> 3.1
 - a cooperative -> 3.2
 - a company -> 3.3
 - other,... -> 3.4
- 3.1 Boss
- 3.1.1 Is your boss additional to trading involved in:
 - fishing
 - processing
 - shipments to Mwaloni Kirumba
 - distribution from Mwaloni Kirumba
 - retailing
 - 3.1.2 Do other people in the market work for your boss?
No -> 3.1.5 Yes -> 3.1.3
 - 3.1.3 How many employees has your boss working on the market?
 - 3.1.4 What are the names of these employees?
 - 3.1.5 What is the name of your boss?
 - 3.1.6 Where is the office of your boss?
In Mwanza -> 3.1.7 Outside Mwanza -> 5.
 - 3.1.7 Does your boss know the quantities and prices at which you are trading?
No -> 5. Yes -> 3.1.8
 - 3.1.8 Thanks for the interview, I will continue the interview with your boss.
The last question: What is your name?

3.2 Cooperative

3.2.1 Is your cooperative additional to trading involved in:

- fishing
- processing
- shipments to Mwaloni Kirumba
- distribution from Mwaloni Kirumba
- retailing

3.2.2 Do other people on this market work for the cooperative?

No -> 3.2.5 yes -> 3.2.3

3.2.3 How many members of the cooperative work on the market?

3.2.4 What are the names of the members working on the market?

3.2.5 What is the name of your cooperative?

3.2.6 What is the location of your cooperative?

In Mwanza -> 3.2.7 Outside Mwanza -> 5.

3.2.7 Does your cooperative register centrally the purchasing/selling of the fish you are trading?

No -> 5. Yes -> 3.2.8

3.2.8 Thank you for the interview, I will continue the interview with the person responsible at your cooperation.

One last question: What is your name?

3.3 Company

3.3.1 Is your company additional to trading involved in:

- fishing
- processing
- shipments to Mwaloni Kirumba
- distribution from Mwaloni Kirumba
- retailing

3.3.2 Do other people in this market work for your company?

No -> 3.3.5 yes -> 3.3.3

3.3.3 How many employees of the company work on the market?

3.3.4 What are the names of the employees who work on the market?

3.3.5 What is the name of your company?

3.3.6 Where is the company situated?

In Mwanza -> 3.3.7 Outside Mwanza -> 5.

3.3.7 Does your company register centrally the purchasing/selling of fish?

No -> 5. Yes -> 3.3.8

3.3.8 Thank you for the interview, I will continue the interview with the responsible in your company.

One last question: What is your name?

3.4 Follow the same line of questioning as in the previous cases.

4. Independent trader

4.1 Are you in addition to trading also involved in:

- fishing
- processing
- shipments to Mwaloni Kirumba
- distribution from Mwaloni Kirumba
- retailing

4.2 Do you employ people?

No -> 6. Yes -> 4.3

4.3 How many people do you employ?

4.4 What are their activities?

4.5 What are the names of those working on the market?

5. No central registration

5.1 Are you (Not your boss/ cooperative/ company) in addition to trading also involved in:

- fishing
- processing
- shipments to Mwaloni Kirumba
- distribution from Mwaloni Kirumba
- retailing

6. Do you trade in fresh or processed fish?

Fresh -> 7. Processed -> 8. Both -> 7. + 8.

7. Fresh fish

7.1 In what species of fish do you trade?

7.2 Determine per specie in what unit (bag, staple, kg, whole fish, ...) the trader is trading.

7.3 Ask per specie what last week's buying price and selling price was.

7.4 Ask per specie the number of units the trader traded last week.

- 7.5 From whom did you buy your fresh fish?
- Transporter
 - Other trader
 - Fisherman
 - Fishing himself
 - Other ,namely ...
- 7.6 Where did you buy your fresh fish?
- At Mwaloni Kirumba
 - On the Lake
 - Somewhere else, namely ...
- 7.7 Do you know the origin of the fish you bought?
- Harvested near Mwanza
 - Harvested somewhere else, namely ...
- 7.8 Do you always trade with the same suppliers?
No -> 7.10 Yes -> 7.9
- 7.9 Why do you always trade with the same suppliers?
- They work on contract base
 - Quality and price the same as other suppliers
 - Easy way of working
 - Family relations
 - Other reason, namely ...
- 7.10 What is(are)the destination(s) of the fresh fish you are selling?
- Near Mwanza
 - Mwanza market
 - Mara region
 - Dar es Salaam
 - Other regions in Tanzania
 - Burundi
 - Rwanda
 - Uganda
 - Kenya
 - Zaire
 - Other, namely ...
- 7.11 Find out where in the aforementioned regions/ nations?
- 7.12 How is the fish transported to the location?
- truck
 - bicycle
 - plane
 - boat
 - wheelbarrel
 - other, namely ...

7.13 From every 100 units you sell, how many are going to the aforementioned locations?

7.14 To whom do you sell your fish?

- A trader at Mwaloni Kirumba
- A transporter
- Consumers
- Artisanal processor
- Industrial processor
- Exporter
- Other, namely ...

7.15 Do you always deal with the same customers?

No -> 7.17 Yes -> 7.16

7.16 Why do you always deal with the same customers?

- They work on a contract base
- An easy way of working
- Family relations
- Other reason, namely ...

7.17 What is your name?

(Continue with 8. or: Thanks for the interview)

8. Processed fish
- 8.1 In what species of processed fish do you trade?
- 8.2 Determine per specie in what unit (bag, staple, kg, whole fish, ...) the trader is trading.
- 8.3 Ask per specie what last week's buying price and selling price was.
- 8.4 Ask per specie the number of units the trader traded last week.
- 8.5 From whom did you buy your processed fish?
- Transporter
 - Other trader
 - Fisherman
 - Fishing himself
 - Other, namely
- 8.6 Where did you buy your processed fish?
- At Mwaloni Kirumba -> 8.7.1
 - On the Lake -> 8.8.1
 - Somewhere else, namely ... -> 8.8.1
- 8.7.1 How is the processed fish transported to Mwaloni Kirumba?
- Fishing boat
 - Transport boat
 - Lorry
 - Bicycle
 - Otherwise, namely ...
- 8.7.2 At what location is the fish processed?
- 8.8.1 How did you transport the processed fish to Mwaloni Kirumba?
- Fishing boat
 - Transport boat
 - Lorry
 - Bicycle
 - Otherwise, namely ...
- 8.8.2 At what location is the fish processed?
- 8.9 Do you always trade with the same suppliers?
 No -> 8.11 Yes -> 8.10
- 8.10 Why do you always trade with the same suppliers?
- They work on contract base
 - Quality and price the same as other suppliers
 - Family relations
 - Easy way of working
 - Other reason, namely ...

8.11 What is(are)the destination(s) of the processed fish you are selling?

- Near Mwanza
- Mwanza market
- Mara region
- Dar es Salaam
- Other regions in Tanzania
- Burundi
- Rwanda
- Uganda
- Kenya
- Zaire
- Other, namely ...

8.12 Find out where in the aforementioned regions/ nations?

8.13 How is the processed fish transported to the location?

- truck
- bicycle
- plane
- boat
- wheelbarrel
- other, namely ...

8.14 From every 100 units you sell, how many are going to the aforementioned locations?

8.15 To whom do you sell your processed fish?

- A trader at Mwaloni Kirumba
- A transporter
- Retailer
- Consumers
- At another market
- Exporter
- Other, namely ...

8.16 Do you always deal with the same customers?

No -> 8.18 Yes -> 8.17

8.17 Why do you always deal with the same customers?

- They work on a contract base
- An easy way of working
- Family relations
- Other reason, namely ...

8.18 What is your name?

(Thanks for the interview)

APPENDIX 3

QUESTIONNAIRE TRANSPORTERS

Questionnaire Transporters

This questionnaire is designed to broaden our insight of the market into which you are operating. The information you give will be treated as confidential.

DO YOU TRANSPORT TO OR FROM MWALONI KIRUMBA?

- TO MWALONI KIRUMBA -> PART A
- FROM MWALONI KIRUMBA -> PART B

PART A

1. What is your nationality?
2. Do you work for yourself?
yes -> 4. no -> 3
3. Who do you work for?
 - a boss -> 3.1
 - a company -> 3.2
 - other, ... -> 3.3

3.1 Boss

3.1.1 Is your boss additional to transporting involved in:

- fishing
- processing
- trading
- retailing

3.1.2 Has your boss more employees who transport fish to Mwaloni Kirumba?
No -> 3.1.5 Yes -> 3.1.3

3.1.3 How many employees transport for your boss to Mwaloni Kirumba?

3.1.4 What are the names of these employees?

3.1.5 What is the name of your boss?

3.1.6 Where is the office of your boss?
In Mwanza -> 3.1.7 Outside Mwanza -> 5.

3.1.7 Does your boss know the quantities and prices at which you are trading?
No -> 5. Yes -> 3.1.8

3.1.8 Thanks for the interview, I will continue the interview with your boss.
The last question: What is your name?

3.2 Company

3.2.1 Is your company additional to transporting involved in:

- fishing
- processing
- trading
- retailing

3.2.2 Has your company more employees who are active in transporting to Mwaloni Kirumba?
No -> 3.2.5 yes -> 3.2.3

3.2.3 How many employees are active in transporting to Mwaloni Kirumba?

3.2.4 What are the names of the employees transporting to Mwaloni Kirumba?

3.2.5 What is the name of your company?

3.2.6 Where is the company situated?

In Mwanza -> 3.2.7

Outside Mwanza -> 5.

3.2.7 Does your company register centrally the purchasing/selling of the fish you transport to Mwaloni Kirumba?

No -> 5.

Yes -> 3.2.8

3.2.8 Thank you for the interview, I will continue the interview with the responsible in your company.

One last question: What is your name?

3.3 Follow the same line of questioning as in the previous cases.

4. Independent transporter

4.1 Are you in addition to transporting also involved in:

- fishing
- processing
- trading
- retailing

4.2 Do you employ people?

No -> 6.

Yes -> 4.3

4.3 How many people do you employ?

4.4 What are their activities?

4.5 What are the names of those active in transporting to Mwaloni Kirumba?

5. No central registration

5.1 Are you (Not your boss/ cooperative/ company) in addition to transporting also involved in:

- fishing
- processing
- trading
- retailing

6. Do you transport fresh or processed fish?

Fresh -> 7.

Processed -> 8.

Both -> 7. + 8.

7. Fresh fish

7.1 What species of fresh fish do you transport?

7.2 Determine per specie in what unit (bag, staple, kg, whole fish, ...) the transporter is trading.

7.3 Ask per specie what last week's buying price and selling price was.

7.4 Ask per specie the number of units the transporter transported last week.

(If the transporter transports various species, make sure you ask the questions per species)

7.5 From whom did you buy your fresh fish?

- Trader
- Fisherman
- Fishing himself
- Other ,namely ...

7.6 Where did you buy your fresh fish?

- On the Lake
- Somewhere else, namely ...

7.7 Do you know the origin of the fish you bought?

- Harvested near Mwanza
- Harvested somewhere else, namely ...

7.8 Do you always trade with the same suppliers?

No -> 7.10 Yes -> 7.9

7.9 Why do you always trade with the same suppliers?

- They work on contract base
- Quality and price the same as other suppliers
- Easy way of working
- Family relations
- Other reason, namely ...

7.10 How did you transport the fish to Mwaloni Kirumba?

- Lorry
- Bicycle
- Fishing boat
- Transport boat
- Other, namely ...

7.11 To whom do you sell your fresh fish?

- A trader at Mwaloni Kirumba
- Another transporter
- Consumers
- Artisanal processor
- Industrial processor
- Exporter
- Other, namely ...

7.12 Do you always deal with the same customers?

No -> 7.14 Yes -> 7.13

7.13 Why do you always deal with the same customers?

- They work on a contract base
- An easy way of working
- Family relations
- Other reason, namely ...

7.14 What is your name?

(Continue with 8. or: Thanks for the interview)

8. Processed fish

8.1 What species of processed fish do you transport?

8.2 Determine per specie in what unit (bag, staple, kg, whole fish, ...) the transporter is trading.

8.3 Ask per specie what last week's buying price and selling price was.

8.4 Ask per specie the number of units the transporter transported last week.

(If the transporter transports various species, make sure you ask the questions per species)

8.5 From whom did you buy your processed fish?

- Trader
- Fisherman/ processor
- Processor
- Fishing himself
- Other, namely ...

8.6 Where did you buy your processed fish?

- On the Lake
- Somewhere else, namely ...

8.7 How did you transport the processed fish to Mwaloni Kirumba?

- Fishing boat
- Transport boat
- Lorry
- Bicycle
- Otherwise, namely ...

8.8 At what location is the fish processed?

8.9 Do you always trade with the same suppliers?

No -> 8.11 Yes -> 8.10

8.10 Why do you always trade with the same suppliers?

- They work on contract base
- Quality and price the same as other suppliers
- Easy way of working
- Family relations
- Other reason, namely ...

8.11 To whom do you sell your processed fish?

- A trader at Mwaloni Kirumba
- Another transporter
- Consumers
- Exporter
- Other, namely ...

8.12 Do you always deal with the same customers?
No -> 8.14 Yes -> 8.13

8.13 Why do you always deal with the same customers?

- They work on a contract base
- An easy way of working
- Family relations
- Other reason, namely ...

8.14 What is your name?

(Thanks for the interview)

PART B

1. What is your nationality?

2. Do you work for yourself?

yes -> 4. no -> 3

3. Who do you work for?

- a boss -> 3.1
- a company -> 3.2
- other, ... -> 3.3

3.1 Boss

3.1.1 Is your boss additional to transporting involved in:

- fishing
- processing
- trading
- retailing

3.1.2 Has your boss more employees who transport fish from Mwaloni Kirumba?

No -> 3.1.5 Yes -> 3.1.3

3.1.3 How many employees transport for your boss from Mwaloni Kirumba?

3.1.4 What are the names of these employees?

3.1.5 What is the name of your boss?

3.1.6 Where is the office of your boss?

In Mwanza -> 3.1.7 Outside Mwanza -> 5.

3.1.7 Does your boss know the quantities and prices at which you are trading?

No -> 5. Yes -> 3.1.8

3.1.8 Thanks for the interview, I will continue the interview with your boss.

The last question: What is your name?

3.2 Company

3.2.1 Is your company additional to transporting involved in:

- fishing
- processing
- trading
- retailing

3.2.2 Has your company more employees who are active in transporting from Mwaloni Kirumba?

No -> 3.2.5 yes -> 3.2.3

- 3.2.3 How many employees are active in transporting from Mwaloni Kirumba?
- 3.2.4 What are the names of the employees transporting from Mwaloni Kirumba?
- 3.2.5 What is the name of your company?
- 3.2.6 Where is the company situated?
In Mwanza -> 3.2.7 Outside Mwanza -> 5.
- 3.2.7 Does your company register centrally the purchasing/selling of the fish you transport from Mwaloni Kirumba?
No -> 5. Yes -> 3.2.8
- 3.2.8 Thank you for the interview, I will continue the interview with the responsible in your company.
One last question: What is your name?

3.3 Follow the same line of questioning as in the previous cases.

4. Independent transporter

4.1 Are you in addition to transporting also involved in:

- fishing
- processing
- trading
- retailing

4.2 Do you employ people?
No -> 6. Yes -> 4.3

4.3 How many people do you employ?

4.4 What are their activities?

4.5 What are the names of those active in transporting from Mwaloni Kirumba?

5. No central registration

5.1 Are you (Not your boss/ cooperative/ company) in addition to transporting also involved in:

- fishing
- processing
- trading
- retailing

6. Do you transport fresh or processed fish?
Fresh -> 7. Processed -> 8. Both -> 7. + 8.

7. Fresh fish

7.1 What species of fish do you transport?

7.2 Determine per specie in what unit (bag, staple, kg, whole fish, ...) the transporter is trading.

7.3 Ask per specie what last week's buying price and selling price was.

7.4 Ask per specie the number of units the transporter transported last week.

(If the transporter transports various species, make sure you ask the questions per species)

7.5 From whom did you buy your fresh fish?

- Trader
- Fisherman
- Other ,namely ...

7.6 Where did you buy your fresh fish?

- At Mwaloni Kirumba
- On the Lake
- Somewhere else, namely ...

7.7 Do you know the origin of the fish you bought?

- Harvested near Mwanza
- Harvested somewhere else, namely ...

7.8 Do you always trade with the same suppliers?

No -> 7.10 Yes -> 7.9

7.9 Why do you always trade with the same suppliers?

- They work on contract base
- Quality and price the same as other suppliers
- Easy way of working
- Family relations
- Other reason, namely ...

7.10 What is(are)the destination(s) of the fresh fish you are transporting?

- Near Mwanza
- Mwanza market
- Mara region
- Dar es Salaam
- Other regions in Tanzania
- Burundi
- Rwanda
- Uganda
- Kenya
- Zaire
- Other, namely ...

7.11 Find out where in the aforementioned regions/ nations?

7.12 How do you transport the fresh fish to the location?

- truck
- bicycle
- plane
- boat
- wheelbarrel
- other, namely ...

7.13 From every 100 units you transport, how many are going to the aforementioned locations?

7.14 To whom do you sell your fish?

- A trader at another market
- Consumers
- Artisanal processor
- Industrial processor
- Exporter
- Other, namely ...

7.15 Do you always deal with the same customers?

No -> 7.17 Yes -> 7.16

7.16 Why do you always deal with the same customers?

- They work on a contract base
- An easy way of working
- Family relations
- Other reason, namely ...

7.17 What is your name?

(Continue with 8. or: Thanks for the interview)

8. Processed fish
- 8.1 What species of processed fish do you transport?
- 8.2 Determine per specie in what unit (bag, staple, kg, whole fish, ...) the transporter is trading.
- 8.3 Ask per specie what last week's buying price and selling price was.
- 8.4 Ask per specie the number of units the transporter transported last week.

(If the transporter transports various species, make sure you ask the questions per species)

- 8.5 From whom did you buy your processed fish?
- Trader
 - Fisherman/ processor
 - Processor
 - Fishing himself
 - Other, namely ...
- 8.6 Where did you buy your processed fish?
- On the Lake
 - Somewhere else, namely ...
- 8.7 How did you transport the processed fish to Mwaloni Kirumba?
- Fishing boat
 - Transport boat
 - Lorry
 - Bicycle
 - Otherwise, namely ...
- 8.8 At what location is the fish processed?
- 8.9 Do you always trade with the same suppliers?
No -> 8.11 Yes -> 8.10
- 8.10 Why do you always trade with the same suppliers?
- They work on contract base
 - Quality and price the same as other suppliers
 - Easy way of working
 - Family relations
 - Other reason, namely ...

8.11 What is(are)the destination(s) of the processed fish you are transporting?

- Near Mwanza
- Mwanza market
- Mara region
- Dar es Salaam
- Other regions in Tanzania
- Burundi
- Rwanda
- Uganda
- Kenya
- Zaire
- Other, namely ...

8.12 Find out where in the aforementioned regions/ nations?

8.13 How do you transport the processed fish to the location?

- truck
- bicycle
- plane
- boat
- wheelbarrel
- other, namely ...

8.14 From every 100 units you transport, how many are going to the aforementioned locations?

8.15 To whom do you sell your processed fish?

- A trader at another market
- Consumers
- Exporter
- Other, namely ...

8.16 Do you always deal with the same customers?

No -> 8.18 Yes -> 8.17

8.17 Why do you always deal with the same customers?

- They work on a contract base
- An easy way of working
- Family relations
- Other reason, namely ...

8.18 What is your name?

(Thanks for the interview)

APPENDIX 4

QUESTIONNAIRE EXPORTERS

Questionnaire exporters

This questionnaire is designed to broaden our insight in the market in which you are operating. The information you give will be treated confidential.

1. COMPANY

Name:

Name respondents:

1.1 Is your company publicly or privately owned?

Privately -> 1.3 Publicly -> 1.5

1.2 What is(are) the nationality(ies) of the owner(s) of your company?

1.3 In what kind of processing is your company involved?

- smoking
- sun-drying
- freezing
- salting
- filleting

(If the company is only smoking, sun-drying or salting end the interview)

In this interview I would like to talk with you about the destinations of your production. I am only interested in destinations of frozen and filleted fish. In this marketing research no attention is given to smoking, sun-drying and salting.

2. OPERATIONS

2.1 Production

2.1.1 What is the present freezing-capacity of your company in tons (yearly/monthly/weekly/daily)?

2.1.2 Does your company have the intention of changing the freezing-capacity in the foreseeable future?

No -> 2.1.6 Yes -> 2.1.3

2.1.3 Do you want to increase or decrease your freezing-capacity?

Increase -> 2.1.4 Decrease -> 2.1.5

2.1.4 How are you going to increase your freezing-capacity?

(Go to 2.16)

2.1.5 How are you going to decrease your freezing-capacity?

2.1.6 What is the current production of frozen or filleted fish in tons of your company (Yearly/ monthly/ weekly/ daily)?

(If there is a difference in current and maximum capacity -> 2.1.7
If there is no difference in current and maximum capacity -> 2.2)

2.1.7 What is the reason you are not operating at full capacity?

- not enough fish supplies.
- not enough distributional capacity.
- not enough demand (at the price the company is charging).
- other reason, namely ...

2.1.8 How many kg of fresh fish do you need for one kg of fillet?

2.1.9 Are you planning to invest in a fish meal plant?

2.2 Distribution channel

2.2.1 Can you explain how you obtain the fish you export?

2.2.2 Can you explain how the fish is distributed onwards?

2.2.3 Do you have problems in obtaining and distributing the fish?

2.3 Quantities, destinations, and marketing.

2.3.1 What is(are) the destination(s) of the frozen or filleted fish you produce?

- Tanzania
- Burundi
- Rwanda
- Kenya (*Ask the city*)
- Uganda
- Europe
- Japan
- Australia
- Israel
- other destination, namely ...

2.3.2 What is(are) the quantity(ies) of frozen or filleted fish you transport to the (various) destination(s) in tons?

2.3.3 Do you expect any changes in your frozen or filleted fish export in the foreseeable future?

No -> 2.3.5 Yes -> 2.3.4

2.3.4 Can you explain this in terms of destinations, quantities or other variables?

2.3.5 How do you transport the frozen fish to the (various) destination(s)?

- by sea
- by air
- by road
- by rail

2.3.6 How is the product marketed?

2.4 Prices

2.4.1 What is the price per kg you pay for one kg of Nile perch and what was last year's price-range?

2.4.2 What are the prices (free on board, or other price) per kg of frozen or filleted fish you charge for the various destinations?

2.5 Market structure

2.5.1 What is your market share in percents of Lake Victorian frozen or filleted fish exports?

2.5.2 Is there strong competition in the export market?

No -> 2.5.5 Yes -> 2.5.3

2.5.3 Who are your main competitors?

2.5.4 How do know there is strong competition?

- Margins are low
- We drive each other off the road, like in Kenya
- Other reasons, namely ...

2.5.5 Do you know of any form of cooperation between competitors?

- Charging the same price
- Sharing of transport facilities
- Other, namely ...

2.5.6 Are there restrictions to export frozen or filleted fish from Tanzania?

No -> 2.6 Yes -> 2.5.7

2.5.7 What are the main restrictions to export frozen fish?

- Available fish
- Minimum export price system
- Infrastructural
- Institutional (Export taxes, quality controls)

2.5.8 Why do people invest in this sector?

2.6 Undeclared exports

2.6.1 Do you know if there is illegal export trade in frozen or filleted fish?

Yes -> 2.6.2

No -> That's a bit naive, but thank you for the interview

2.6.2 Can you explain the way this is done?

2.6.3 Can you assess the quantity of frozen or filleted fish that are exported illegally (Yearly/ monthly/ weekly/ daily)?

2.6.4 Can you assess the share of illegal exports in the total volume of exports?

APPENDIX 5

CALCULATION OF THE PROFIT OF AN AVERAGE PROCESSING COMPANY

Price break-even situation:

Turnover	= Capacity x Normal capacity x Selling price = 15 tons x 80% x US\$ 2.9 =	US\$ 34,800
Costs 1. Fish	= Capacity x Normal capacity x Break-even price x Conversion factor = 15 tons x 80% x US\$ 0.5 x 3 =	US\$ 18,000
2. Other costs	= see calculation	
Break-even point	= Turnover = Costs	
Other costs	= Turnover - Costs of fish = 34,800 - 18,000 =	US\$ 16,800

Present situation:

Costs 1. Fish	= Capacity x Normal Capacity x Price x Conversion factor = 15 tons x 0.8 x US\$ 0.2 x 3 =	US\$ 7,200
Daily profit	= Turnover - (Costs of fish + Other costs) = 34,800 - (7,200 + 16,800) =	US\$ 10,800
Yearly profit	= Days of production x Daily profit = 300 x 10,800 =	US\$ 3,240,000

Quantity break-even situation:

Turnover	= Capacity x Break-even capacity x Selling price = 15 tons x 40% x US\$ 2.9 =	US\$ 17,400
Costs 1. Fish	= Capacity x Break-even capacity x Buying price x Conversion factor = 15 tons x 40% x US\$ 0.2 x 3 =	US\$ 3,600
2. Other costs	= see calculation	
Break-even point	= Turnover = costs	
Other costs	= Turnover - Costs of fish = 17,400 - 3,600 =	US\$ 13,800
Capacity	: 30% -> Other costs =	US\$ 13,800
	: 80% -> Other costs =	US\$ 16,800

Conclusion

With increasing capacity the other costs go up quite slowly. This means that the fixed costs of the plant are high. The profit is so high because the plant breaks even at low capacity while the fixed costs are high.

APPENDIX 6

FISH MAWS

Trading in fish maws has started about four years ago in Kenya. A Chinese trader was purchasing the fish maws for transport to the Chinese belt. Trading in fish maws has spread out across Lake Victoria the last two years.

As reported in Chapter 4, all processing plants will be marketing the fish maws. Apart from these plants, there are about 6 exporters in Tanzania who have specialized in fish maws. The exporters purchase the maws from artisanal Nile perch smokers and dryers. The maws are collected with a motorboat and are processed (further drying, cleaning, and removing oil) by the company. Export is via the ports of Mombasa and Dar es Salaam, mainly to Hong-Kong and Singapore. In Hong-Kong or Singapore the maws are divided into bigger and smaller ones. The bigger, more expensive maws are distributed to Japan, the smaller, cheaper maws are transported to China.

One kg of Nile perch has, on average, 20 grams of wet maws. When the maws are dried 10 grams are left over.

The prices in the various stages of distribution are depicted in the following table.

Prices of maws per kg the various stages of distribution.		
	Tshs.	US\$
Fisherman	1400-1600 *	3.5 - 4
Sub-agent	1600-1700	4 - 4.25
Agent	1800	4.5
Company, Mombasa free on board	3600	9
Company, Hong-Kong freight paid price	4000	10

* Depending on the quantity sold

The company buys the maws for Tshs. 1800, but the real price is around Tshs. 2200. This is due to the fact that the company has a 2% weight loss because the maws are not dry, a 10% weight loss because it has to clean the maws and remove the oil added by the fishermen to increase the weight, and a 2% weight loss when the fish arrives in Dar es Salaam or Mombasa because of difference in temperature.

The costs for processing, packing, and transport are around Tshs. 400 per kg. The profit per kg is Tshs. 3600 (US\$ 9) - (2200 + 400) = Tshs. 1000 per kg, or US\$ 2.5.

In Mwanza four processors/exporters of fish maws are active. A respondent estimated the processors in Mwanza to export around 30 tons of maws per month, 240 tons yearly.

LIST OF IFIP REPORTS - LISTE DES RAPPORTS PPEC

I. TECHNICAL DOCUMENTS / DOCUMENTS TECHNIQUES

- Gréboval D., A. Bonzon, M. Giudicelli and E. Chondoma, Baseline Survey
1989 report (1987) on inland fisheries planning, development and
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- Gréboval D., A. Bonzon, M. Giudicelli et E. Chondoma, Rapport de l'étude de
1989 base (1987) sur la planification, le développement et
l'aménagement des pêches continentales en Afrique Orientale/
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