The patterns and trends of Marketing and consumption of the fish of Lake Victoria (Kenya Waters)

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ABSTRACT

Over 90% of Kenya's fish is produced from Lake Victoria, its principle source of fish for domestic consumption and for export. The three fish species of most economic importance are *Lates niloticus, Rastrineobola argentea* and *Oreochromis* species. The structure and performance of the marketing system for each of these species differs depending on certain market features such as marketing history and the infrastructural development of fish landing beaches, the type of processed product, the organisation and distribution of marketing middlemen, the location and size of consumer markets and product supply and demand factors.

This paper broadly examines historical aspects, current status and trends in the marketing and consumption of these three fish species and forecasts future patterns. It assesses the structure of fish marketing channels and the organisation and functions of marketing middlemen. Demand and price issues in the fish industry are also discussed.

Results indicate important changes in the marketing and consumption patterns of Lake Victoria's fish. The fishery has evolved from a traditionally subsistence venture to highly commercial industry with profit maximization objectives. Marketing channels have expanded to include capital-intensive industrial fish processors targeting the export market. Consumer fish prices have increased by more than 10% in the last decade causing shifts in demand. There has been a general shift from domestic consumption of high quality Nile perch and tilapia to the low grade by-products of Nile perch filleting.

INTRODUCTION

Lake Victoria is Kenya's leading source of fish for domestic consumption and export. All sources of fish in Kenya have had a general upward production trend, with Lake Victoria consistently providing over 85% of the national output, and over 50% of the total value of fish landed from national waters (Table 3). The commercially exploited fish species from the lake are *Lates niloticus, Rastrineobola argentea* and *Oreochromis* species which composed 50%, 37% and 6% respectively of the total catch in 1993 (OTHINA and OSEWE-ODERA, 1994). The fishery has 208 fish landing and marketing beaches (HOEKSTRA et al., 1990), is worked by about 24,000 fishermen (OGUTU, 1992). Marketing of fish starts as soon as it is landed and continues as the fish is passed down a clearly defined marketing channel until it reaches the retail outlet.

The marketing sector is the link between the fisherman and the consumer and its performance has a major impact on fish production, pricing and consumption. It is therefore necessary to study the patterns and trends in the marketing of Lake Victoria's fish and its influence on fish consumption. This study aims to:-

(a) examine the history, current status and trends in the marketing of Lake Victoria's fish locally, nationally and on the export market.
(b) assess the structure of Lake Victoria's fish marketing system.
(c) assess fish consumption patterns and trends in Kenya and analyze factors determining fish pricing and consumer demand.

Data used in the study were mainly obtained through interviews with key informants (beach leaders, fish traders and processors) using a focus group approach. More information was obtained by interviewing artisanal and industrial fish processors, traders and fish consumers in Kisumu. Secondary data were also used.

An overview of the History of Fish Marketing on the Beaches

Fish marketing on major Lake Victoria's beaches started between the 1920's and 1940's depending on their location. Beaches in the Winam Gulf have a longer history of marketing than those in the open waters. Initially fishermen performed all harvesting, processing and marketing roles. They caught a variety of fish indigenous to the lake and processed them mainly by sun-drying. Later,

other processing methods like smoking, salting and frying were gradually introduced.

Traders of Asian origin started buying fish on the beaches using motor-engine propelled boats as early as 1934 and until the 1950's. They bought mainly tilapia from beaches around the Gulf and transported it to Kisumu and other urban centers. Local traders on bicycles also participated in fish marketing from the mid-1940's by transporting fish to nearby and distant markets. They were joined by female traders who transported fish between markets on foot. The use of vehicles to transport fish was a later development used in the early 1960's. However, this mode was, and still is, limited to beaches accessible by road. The development of landing beaches has been closely associated with the fishing activity and volume of fish marketed.

Fish Trade in the Post Nile Perch Era and the Local and National Marketing of Nile perch

The emergence of Nile perch was observed by fishermen on different beaches at various times between 1966 and 1972. The acceptance rate for fresh Nile perch among potential consumers was initially very low up to the late 1970's. Consumers had different reasons for this, such as not knowing how to prepare the fish, or feeling that the fish had a strange/new taste and the fish's predatory habits were repulsive. However, in the 1980's the fish became increasingly popular locally and nationally. This has been promoted largely by improved and diversified processing techniques such as smoking and deepfrying which has widened its marketability and consumption. The marketing of by-products of the industrial filleting of Nile perch, particularly Nile perch frames, is now also

Fig. 1 Marketing Channel for L. Victoria's Fish

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=·=·=·=·=·=·=·=·= Other channel
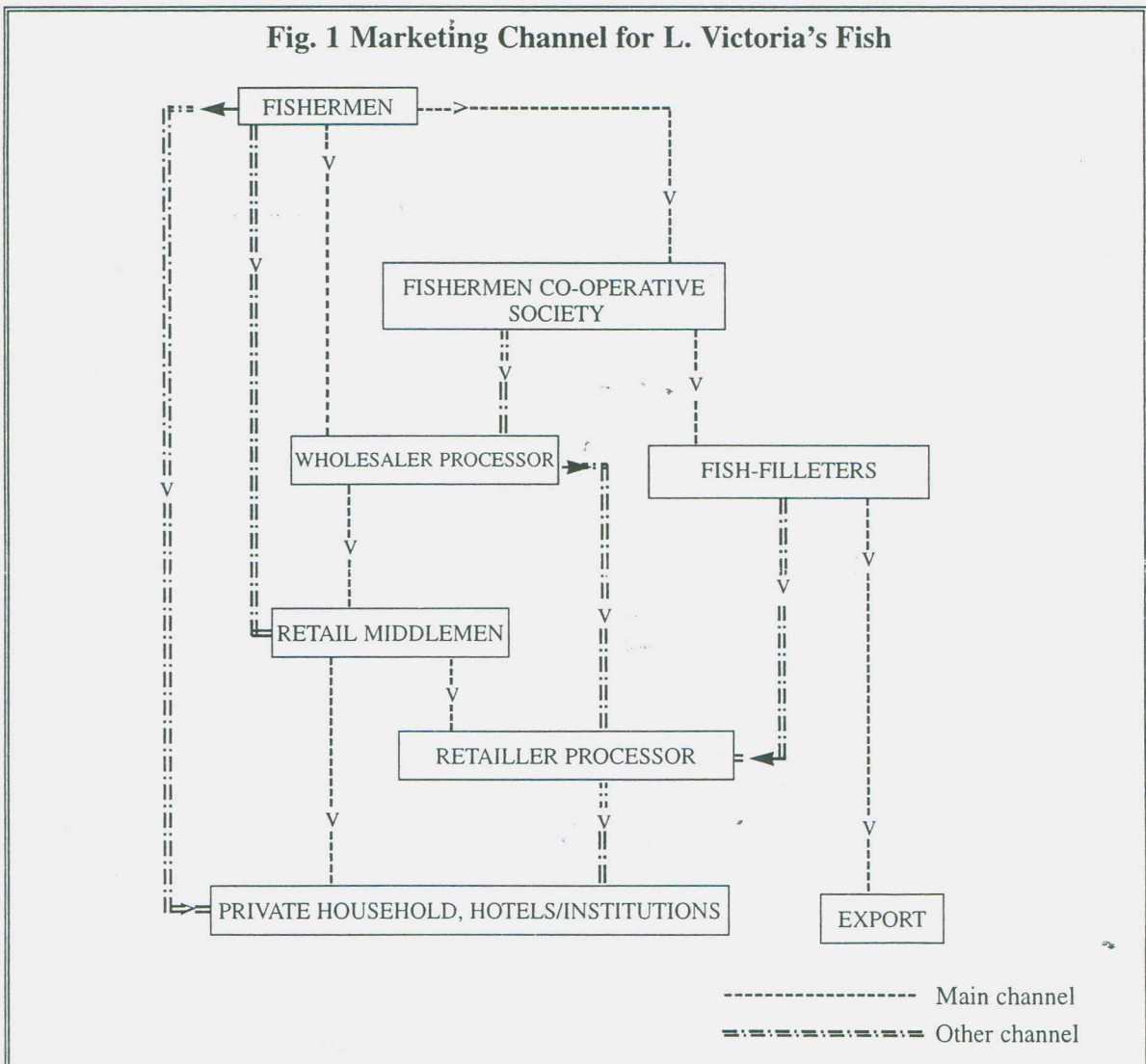
important on the national market. Some fried Nile perch fillet is also sold to high class hotels and street cafes.

Domestic trade in fresh (unprocessed) Nile perch is largely confined to the local market. This form is highly perishable and the fish may not be transported to distant national markets. Traders interviewed argued that due to the lower domestic demand, investing in cold storage facilities may not be economically viable for the national markets.

## The International Market for Nile perch

Frozen Nile perch fillets have been exported from Kenya since 1980. The export of these fillets is now the most successful outlet for Kenya's Nile perch. Importing countries are found in Europe, America, the Middle East and Australia (OGUNJA, 1994). Table 4 gives the quantities and values of fish and fish products exported from Kenya. Export prices are currently in the range of US $ 3 - $4.5 per kg f.o.b. and have encouraged the growth of fish filleting industries with major investments in transport, filleting and cold storage facilities. Other factors which have promoted the growth of the industrial fish processing sector are the increased landings of Kenya's Nile perch and the unsatisfied demand for Nile perch fillet on the export market.

There were 15 fish filleting companies in Kenya in 1988, increasing to 25 in late 1994. The expansion of industrial fish processing has introduced two notable problems. First, small-scale traders have been sidelined from the direct marketing of fresh Nile perch. Secondly the high beach prices for the person are reflected as high consumer prices with consequent declines in the domestic consumption of the fish. However the expansion of industrial filleting has generated the growth of the artisanal processing and sale of Nile perch filleting by-products, especially Ni'e perch frames. It has also led to more competitive prices to fishermen.

Markets for Tilapia and *R. argentea*

Tilapia and *R. argentea* are chiefly traded on the domestic markets. Locally, the species have been marketed and consumed by the inhabitants of the lake region for much longer than Nile perch. A survey of fish consumers revealed that tilapia is the most preferred fish on the local and national markets, though its consumption is limited by its high price. The export market for tilapia fillets is not well developed, though two industries indicated that they exported a little tilapia fillet when the supply is high. *R. argentea* is marketed locally in fresh and sun-dried forms. On the national market, however, it is all sold in the sun-dried form. An increasingly important outlet for *R. argentea*

Fig. 1 Fish Exports
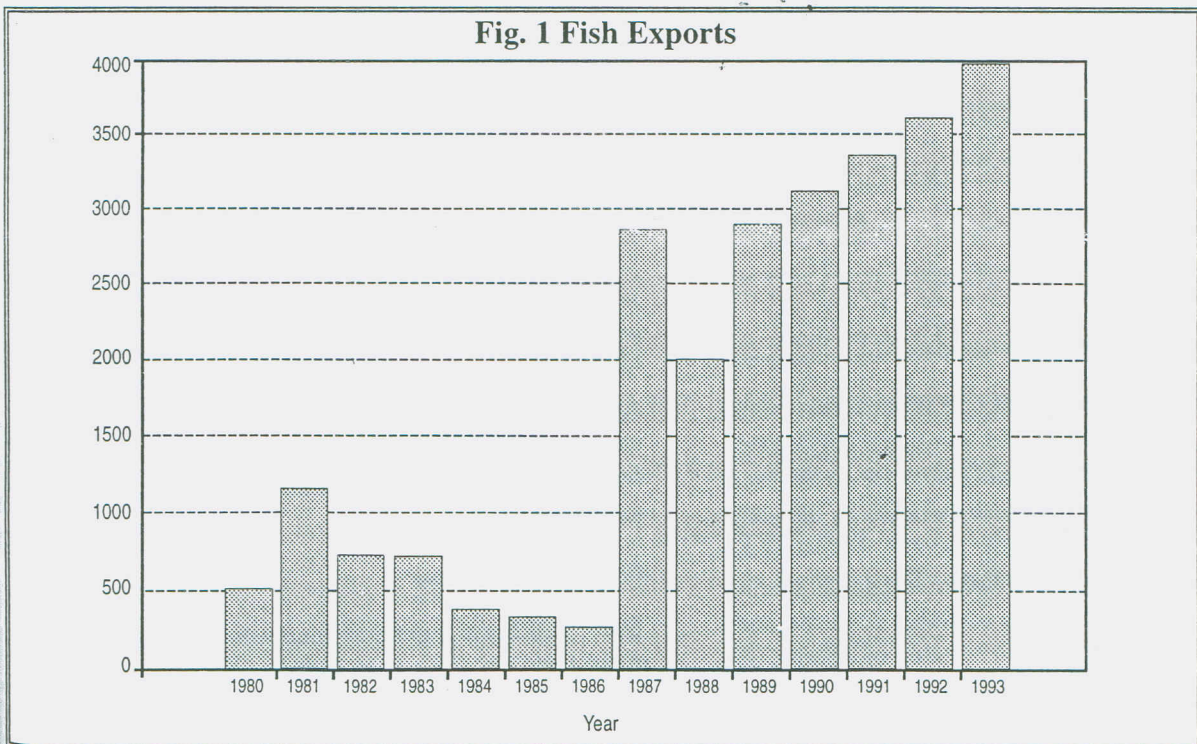
is the animal feeds industry. This has had an impact on the local and national price of the fish. The challenges of marketing *tilapia* and *R. argentea* are how to raise the supply and lower price of tilapia and to strike a balance between domestic consumption versus industrial processing needs for *R. argentea*.

The first problem may be overcome by promoting the supply of tilapia from other sources, including aquaculture. In the second case, other fish products, such as the byproducts of Nile perch filleting, may be used to manufacture animal feeds and lower demand on *R. argentea*.

Types of Processed Fish

The forms in which each of the three fish groups are marketed has evolved with time but is mainly dictated by two factors, namely: the need to minimize losses resulting from fish spoilage and the aim to satisfy consumer tastes and 'preferences. The first is a supply related goal while the second is a demand spelt strategy.

Nile perch is exported either fresh or frozen. On the domestic market, Nile perch is sold fresh (whole), smoked whole/sections, fried frames and fried whole/sections. Table 1 shows the composition and preference of various Nile perch forms in Kisumu market.

Table 1: Percentage Composition and preference of Nile perch forms in Kibuye wholesale market, Kisumu

	Fresh whole	Smoked whole/ sections	Fried frames frames	Fried whole/ sections
% composition (counted prices)	23%	5%	45%	26%
Order of consumer preference	3	1	4	2

Tilapia is marketed mainly in three forms: fresh (whole), fried (whole) and sun-dried (dissected). All the three forms are highly popular on the local and national markets. Fresh (whole) is the most available on the wholesale market, followed by the sun-dried (dissected) form. The local market for sun-dried *R. argentea* contains both the sun-dried form and fresh form at rates of about 60% and 40% respectively. The national market, how-

ever, absorbs more than 95% of *R. argentea* in the sun-dried from.

Functions of Marketing Middlemen ·

Fishermen: Fish harvesting and the sale of fish at the shoreline. This is a male dominated task.

Wholesalers: Bulk-buying of fish from fishermen or cooperative societies and re-sale to fish retailers. Fish is often transported from the beach to the retail market.

Retail traders: Buy fish from wholesalers, transport and sell to consumers. They may store or process fish which is not sold in good time. This sector is dominated by women.

Semi-processors: Buy fish from fishermen, cooperatives or industrial filleting companies, which they process and re-sell to other retailers or consumers. These are mainly women.

These marketing channels are well organized and ensure the efficient transfer of fish from the landing beach to the consumer. However, consumer prices reflect huge gross margins to traders since there are many traders performing the same functions. Table 2 shows the aggregate gross margins to traders selling fish between various fish sources and the Kisumu retail market expressed as percentage of the retail price.

Table 2: Gross Margins (as % of Retail Price) for Traders Selling Fish Between source and Kisumu Retail Market.

	% Gross margins to retail traders	% Gross margins to wholesale traders	Total % Gross margins
Fresh *Tilapia*	18.9	17.2	37
Sundried *Tilapia*	19.9	21.7	41.6
Sundried *R. argentea*	22.7	4.2	27.0
Fresh Nile perch	9.4	7.2	16.7

Apart from Nile perch, the margins are high and may be lowered by eliminating duplicated market functions and reducing the number of intermediate trade levels.

Fish Pricing issues

There has been a general increase in fish prices in the last two and a half decades. Between 1971 and 1985, the average beach price for all fish

rose from 1.09 K. Shs/kg to 2.94 K.Shs/kg (REYNOLDS and GREBOVAL, 1988; NZIOKA, 1986). Besides the factors indicated earlier, price level is the most important factor affecting fish consumption. Factors affecting price of Lake Victoria's fish are:

(i) The level of fish supply: Fish supply depends on the harvesting technology used, the catch effort (a factor of distance and man hours spent), weather and marketing facilities for processing, storage and transport. There are two aspects: interseasonal supply variations, especially applicable in the case of riverine fish species, and lunar variations supply variations affecting *R. argentea*. For example in May 1994, the price of *R. argentea* varied from 29.50 K.Shs/kg in the dark moon phase to 40 K shs/kg in the bright moon phase, largely attributed to the changes in supply levels in the two phases.

(ii) Level of demand: When demand for a commodity rises, the price will rise, *ceteris paribus*. There are two aspects: demand for own product and derived demand. The latter has occurred in the case of Nile perch where high export demand has quickly translated into demand for Nile perch at the beach level. Thus the beach price rose from 2.01 K Shs/kg in 1986 to 35 Kshs/kg in 1995.

(iii) The processed form of the fish: Fish prices differ according to the form and quality in which the final product is marketed. This is related to the preference attached to a particular form.

(iv) Market interventions: Co-operative societies may set fish prices on behalf of fishermen. Such prices may remain fixed for long periods irrespective of fluctuations in the supply patterns. There are also instances of collusion between traders at the terminal markets which may influence prices.

(v) Production and marketing costs: any costs incurred in processing, handling, storage and transport are reflected in final fish prices. Transport costs are especially important in determining the final price. The control of these factors, where possible, will help stabilize prices and encourage fish consumption.

The Patterns and Trends in the Consumption of Lake Victoria's Fish

Fish consumption in Kenya is dictated by cultural tradition, proximity to fishing areas and population densities. The consumption of Lake Victoria's fish is highest within the lake region (MOEN, 1983). Traditionally, the major consumers of the lake's fish have been members of the Luo ethnic group. The ethnic tag on fish consumption is disappearing fast as more groups now include fish on their household menu. There are several factors that determine the levels and trends of fish consumption:

(i) Consumer tastes and preferences: These may change. Hence, there has been a gradual acceptance of Nile perch.

(ii) Fish prices: There has been a drastic rise in the price of all fish types in the last decade. This has led to a negative consumption trend for fish. A household survey revealed that low income earning groups now consume less fish than 10 years ago. They attribute this to the disappearance of many indigenous fish species and also that fish has become unaffordable. As fish prices continue to rise, it will be largely consumed by middle and upper income groups.

(iii) The price of substitutes: The closest substitutes to fish are animal protein sources such as meat and eggs. The prices of these have also risen in the last decade, their influence on fish consumption is therefore minimal.

(iv) Interspecies preferences: One fish species is a potential substitute for other species. Changes in the price of one fish species will have an inverse influence in the consumption of the other species. Local fish consumers believe that the drastic rise in beach price of Nile perch in the last decade has made them consume more *R. argentea*. It should also be noted that different processed forms may substitute each other.

(v) Changes in income: Increases in the income of fish consumers is likely to make them eat more of the highly priced

species (all else being equal). Local fish consumers indicated that increased incomes may make them consume less *R. argentea* and more tilapia.

CONCLUSIONS

1.   The development of fish landing beaches is closely linked to the history of fish marketing on the same beach. Improved infrastructure to the beach may therefore induce greater returns from enhanced marketing.

2.   Nile perch has positively influenced fishing and marketing. It has led to the growth of artisanal processing activities and the marketing of by-products of Nile perch filleting, besides earning foreign exchange for Kenya.

3.   Industrial filleting of Nile perch and the use of *R. argentea* in animal feeds manufacturing has raised domestic fish prices and lowered their consumption. Nevertheless, they remain the most rewarding outlets for the traders of the two species.

4.   The fish marketing and processing sector is increasingly dominated by women while men specialize in fish harvesting.

5.   There has been a general rise in the price of all fish species. Consequently, there has been a shift in consumption of high quality fish to lower rated by-products of Nile perch filleting.

4.   Factors affecting fish prices and consumption trends should be closely monitored to ensure price stability and greater fish consumption.

Table 3. Quantity ('000 m.t.) and value (million K£) of fish landed in Kenya from Lake Victoria and other sources (1974 -1992).

	Production (m.t.)			Value (Million K£)		
Year	L. Victoria fisheries	Other	Total	L. Victoria fisheries	Other	Total
1974	17.18	11.11	28.29	1.05	.62	1 67
1975	16.58	10.45	27.03	1.07	.82	1.89
1976	18.68	9.56	28.24	1.2	.72	1.92
1977	19.33	21.34	40 67	1.28	1.41	2 69
1978	23.86	22.35	46.21	1.85	1.64	3.49
1979	30.59	18.44	49.03	2.85	1.46	4.31
1980	26.91	20.88	47.79	2.94	2.18	5 12
1981	38.18	18.76	56.96	4.27	3.59	7 86
1982	60.96	15.11	76.07	6.17	4.33	10.50
1983	77.33	15.78	93.11	6.02	4.38	10.40
1984	71.85	14.56	86 41	6.67	4.88	11.55
1985	88.6	13.68	102.28	9.53	5.57	15 10
1986	102.25	16.01	119 17	12.36	5.64	18 00
1987	125.63	19.71	133 26	17.41	6.4	23.81
1988	138.31	11.96	137.11	26.06	5.21	31.27
1989	215.97	18.56	152.41	34.17	4.6	38.77
1990	211.3	15.73	200.83	77.37	8.63	86.00
1991	216.17	11.16	197 53	82.5	9.67	92.17
1992	219.47	13.71	197.49	90.2	11.58	98.78

Source: Kenya Statistical Abstracts (1970-1993)

Table 4. Quantity and value of fish and fish products Exported from Kenya (1980 -1993).

Year	Qty. of Fish Exported (Metric tonnes)	Value of Exports (Million K.Shs)
1980	523	4.69
1981	1 160	14.71
1982	738	15.02
1983	734	15.02
1984	358	8.54
1985	338	1.42
1986	264	1.21
1987	2 877	85.52
1988	2 010	63.31
1989	2 905	94.40
1990	3 125	98.23
1991	3 359	101.10
1992	3 612	112.52
1993	3 981	123.04

Source: Kenya Annual Trade Report. 1980 - 1994.

REFERENCES

Hoekstra, T.M., A.Asila, C. Rabuor, O. Rabiri (1990). "Report on the Census of Fishing Boats and Gear in Lake Victoria", Kenya" UNDP/FAO Regional Project, IFIP, Nairobi.

Kenya Government (1994). "Annual Trade Report" Customs and Excise Department, Nairobi.

Kenya Government (1994). "Statistical Abstracts 1970 -1994". Central Bureau of Statistics, Nairobi.

Moen, E. (1983). "Fish market patterns and aspects", FAO Fisheries Technical paper No. 233, FAO, Rome.

Nzioka R.M. (1986). "Fish processing and Distribution in Kenya", Kenya Aquatica Bulletin No.3, KMFRI, Mombasa.

Ogunja, J.C. (1994). "Industrial Utilization of Nile Perch By-products", Proceedings of the FAO/KMFRI Seminar on Nile Perch By-products Utilization held on 7 - 10 June 1994 at Sunset Hotel. Kisumu.

Ogutu, G.M. (1992). "Socio-economic condition of Lake Victoria fishermen", "The Aquatic Resource Magazine", Vol. 1 No. 1, National Printing Press, Kisumu.

Othina A.N. and S. Osewe-Odera (1994). "Catch and Effort Assessment Survey for the Artisanal Fisheries of Lake Victoria (Kenya waters), KMFRI, Kisumu.

Reynolds, J.E. and D.G. Greboval (1988). "Socio-economic effects of evolution of Nile perch fisheries in Lake Victoria: a Review", CIFA Technical papers, FAO, Rome United Nations (1992). A survey of Economic and Social conditions in Africa, 1989 - 90", United Nations, New York.