

FISH PROCESSING AND DISTRIBUTION IN KENYA

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ABSTRACT:

Kenya has a potential to land 150,000 metric tonnes of fish annually worthy U.S. \$ 50 million.

The present annual fish landed is about 50,000 metric tonnes worth U.S. \$ 16.7 million. Some of the fishing areas are near the main urban centres and fish landed is disposed of fresh. However, due to preservation and communication difficulties, fish from areas that are far from population centres are processed. About 5% of the annual total catch is processed as salted, sun-dried, smoked, chilled, frozen and filleted and as fish meal.

Fish processing is largely dominated by traditional methods of curing. Curing by smoking is the most widely practised method. Sun-drying without salting is widely practised inland while in the coastal areas sun-dried fish is salted. There is lack of adequate preservation facilities such as freezing and cold storage in the main fishing areas. However, steps are being taken by the Government to improve the various fish landing facilities by installation of ice plants and cold storage facilities in the main centres. Fish is transported to the urban area in refrigerated trucks or in ice boxes.

INTRODUCTION:

Kenya has a considerable fisheries potential which is indicated by the presence of 10,000 km of lakes, mostly freshwater and a coastline of 640 km. In addition to these there are numerous fish bearing rivers, streams and several thousand ponds (Fig. 1). It is estimated that there is a potential to land 150,000 metric tonnes of fish yearly. The forecast for annual fish landing has been about 50,000 metric tonnes which in the last few years, has nearly doubled in 1983 (Department of Fisheries Statistics 1983).

A total of 97,461 metric tonnes of fish were landed by local fishermen in 1983 which was an increase of 20.1% as compared to 1982. Lake Victoria contributed to 79.3%, Lake Turkana 10.4%, Marine 8.3%, Lake Naivasha 0.7%, Lake Baringo 0.4%, fish farming 0.6% and others (rivers and dams) 0.3% (Table I).

DISPOSITION OF CATCH

LAKE VICTORIA

In 1983 a total fresh weight of 77327 metric tonnes of fish valued at Kshs. 120.3* million to the fishermen was landed. This quantity increased by 26.9% while the valued declined as compared to 1982 (Table I).

This decline was brought about by the decrease in average prices of Nile perch (*Lates niloticus*) and *Engraulicypris* which fell from Kshs. 1.82 to Kshs. 1.39 and Kshs. 1.36 to Kshs. 1.09 per kg respectively. These two species contribute 89% of the total catch in the lake and 75.4% of the total value to the fishermen. 95% of the total catch was marketed while 5% was consumed locally around the landing beaches. The number of canoes involved in fishing is estimated as 5,000 with an estimated number of fishermen of 20,000.

LAKE TURKANA

A total of 10,113 metric tonnes of fish valued at Kshs. 13.6 million to the local fishermen was landed in 1983. This was a drop by 9% compared to the previous years catch of 11,040 metric tonnes, but the value rose by 12.6%, with Nile perch, Tilapia and Labeo dominating the catch. Lake Turkana Fishermen Co-operative Society purchased 45.3% of the fish landed while trade out of the area contributed 20.7% and the rest 34% was consumed locally. (Table II).

LAKE NAIVASHA

A total of 692 metric tonnes worthy approximately Kshs. 9.38 million was landed in 1983. There was an increase of 68.5% over 1982 in quantity and 63.5% in value. The increase in price was attributed partly due to the increase in number of fishing boats to just over 100 boats, and secondly there was no enough fish from members of Fishermen Co-operative Society of Naivasha due to poachers who took their fish to Nairobi.

The Co-operative Society collected only commission from Fishermen and left them to deal directly with fish traders. The bulk of L. Naivasha fish (Tilapia and Black bass) is marketed fresh to Nairobi and nearby towns. Crayfish amounted to 116 metric tonnes worthy Kshs. 2.7 million and was exported mainly to France and Netherlands. A matter of interest, fish from Lake Naivasha is more costly than (freshwater) fish from other part of the country apart from trout. Tilapia and Black bass sold at an average of Kshs. 11.40 and Kshs. 13.75 per kg respectively.

*1. U.S. \$ - Kshs. 15.16 (October, 1984)

LAKE BARINGO

Lake Baringo landing dropped from 401 metric tonnes in 1982 to 352 metric tonnes in 1983 valued at Kshs. 648.000 to the fishermen. This drop might have been caused by the drought affecting the breeding grounds. Lake Baringo filleting factory which operated for most of the year, purchased a total of 98 tonnes of Tilapia. Out of this purchase the factory made 27.994 packets of 400 gm and 1831 blocks of 3 kg. This factory continue to be a major market for Tilapia to the fishermen (Table III).

The other major species i.e. *Barbus* and *Clarius* are transported fresh from Kampi ya Samaki Central Landing beach to Nairobi and near by towns. Price at the landing beach are Kshs. 2.00 for Tilapia and *Barbus* and Kshs. 1.00 for *Clarius* per kg.

FISH FARMING

A total of 585 metric tonnes of Tilapia, Carp and Trout worth Kshs. 15.9 million was harvested by local farmers in 1983. This reflects an increase of 33%, Trout 28.9% and Carps 22.5% and prices on average were Kshs. 11.50, 8.50 and 68.00 per kg respectively.

RIVERS AND DAMS

Rivers and dams contributed 267 metric tonnes of fish valued at Kshs. 1.87 million, which was a drop from last year (1982) when the quantity was 452 metric tonnes.

MARINE

From the coast 8125 metric tonnes valued at Kshs. 61.01 million was landed. Out of this 1732 metric tonnes worth Kshs. 4.9 was freshwater from the lower Tana River. Marine Fish catch was 6393 metric tonnes worth Kshs. 56.1 million.

In the marine environment, demersal species contributed 48.5%, pelagic 17.1%, Game/Deep Sea Fish 10.8%, Crustacea 7.4%, Sharks 14.4% and others (oyster, becher-der-mer etc) 1.9%. On average demersal fish cost Kshs. 5.60, pelagic 7.45, Crustacea 22.75 and others 33.75 per kg.

EXPORTS AND IMPORTS OF FISH AND FISHERY PRODUCTS IN KENYA

In 1981 the quantity of fish and fishery products exported was 1460 metric tonnes which dropped to 911.8 metric tonnes in 1982 and rose to 1466 metric tonnes in 1983 valued at Kshs. 34.3 million.

Exports were mainly live fish, fillets frozen and crustacea and molluscs fresh (Live and dead). The main importers were Netherlands (Holland), France, Singapore and Zaire (Table IV). Imports of fish and fishery products into the country increased from 1970 metric tonnes in 1982 to 1617 metric tonnes in 1983 valued at Kshs. 11.8 million.

Kenya imported more fish and fishery products than she exported. However, the value of the exports was much higher than the imports (Table V).

HANDLING PRACTICES

There is a considerable variation in methods of handling fish on board fishing vessels, and landing beaches. Some trawlers are fitted with refrigerated fish holds while the majority are fitted with an insulated fish holds or ice boxes. local fishermen in their dug-out canoes or dhows do not have such facilities. They gut the fish and keep them in shade on the deck where water is constantly poured on them to keep them wet.

On the landing beaches, fish is off-loaded from vessels in boxes while in the canoes baskets are used, and at times the fish are thread through the gills in series keeping fishes of the same family together.

Once the fish have been off loaded, some are packed in wooden boxes in vans and taken to urban centres. Normally the box is lined with aluminium sheet. Layers of fish and ice are added alternatively until the box is full. Packing is usually very efficient and fish arrive in the market in excellent condition. Road transport is the most common method of transportation of fish in vans, lorries, buses and even bicycles. A few of the trucks are refrigerated for long distant journeys. In fishing areas far from the urban areas, fish are processed.

FISH PROCESSING

Fish Processing in Kenya varies considerably with area and fish species.

NILE PERCH (*LATES NILOTICUS*)

In Lake Victoria, Nile perch is processed in several ways. Small sized specimen (below 30 cm) is either sun dried or smoked, since at this size the fish does not have a lot of fat. Fish above 30 cm is normally deep fried. The fish is first split open and the viscera is removed, then placed in a hot frying pan without oil so as to melt the fat in the fish.

After removing as much fat as possible, the fish is then cut into cubes of about 5 cm square. These cubes are then deep fried in cooking oil and when cooking oil is not available the fishermen use the fat extracted from the large specimen. When Nile perch is treated in this manner it becomes very tasty.

Large specimen are also transported to the urban centres in refrigerated trucks where fillets are removed and sold in packets of 300 gm. When fillets have been removed at the lake side, the carcass is sold at Kshs. 2.0 - 5.0 for soup. Smoking of Nile perch is sometimes carried out at the lake region but it is not popular due to the fat. In Lake Turkana, Nile perch is normally sun-dried hanged on strings. Since Lake Turkana area is dry and less humid, the fish dries within 2 days. The fish are salted before sun-drying.

TILAPIA NILOTICA

This species is scarce in Lake Victoria and the few that are caught are eaten fresh. In Lake Turkana, they are eaten fresh, sun-dried and salted. Most of the fresh fish is taken to urban areas in refrigerated trucks. In Lake Baringo, the fish is taken to the fish factory where fillet is removed and packed in packets of 400 gms and blocks of 3 kg for export. Other species, especially *Bagrus* and *Clarias* are smoked without salt or eaten fresh in around Lake Turkana. *Engraulicypris* is sun-dried around Lake Victoria.

Along the coast, sharks are sun-dried without salt and large size shrimps are deep frozen and packed for export while the small sized shrimps are boiled in salt solution dried and then sold in the local markets.

CONCLUSIONS AND RECOMMENDATIONS

There is a need to look into all aspects of fishery production in the country and particularly to what happens to the fish landed.

Fish marketing and handling are important factors in the general development of fishery in Kenya. It is noted that at the moment the marketing of fish in the country is based on more or less traditional patterns and that fish handling and processing is still in a pre-mature stage with no information available on how best the fishermen can handle their products either at sea or just after landing. This state of affairs has invariably resulted in a very high degree of spoilage resulting in a lot of wastage with very minimal returns to the fishermen.

There is urgent need to improve handling and processing of fish so as to improve the fishermen's income and the quality of food consumed by the people in the rural areas, as well as having high quality products which can compete in aquatic products in world market.

TABLE 1. QUANTITY (METRIC TONNES) AND VALUE (KSHS. 1000) OF FISH TO FISHERMEN (1981-1983)

LOCALITY	1981		1982		1983	
	Quantity	Value	Quantity	Value	Quantity	Value
L. Victoria	38179	85346	60958	123400	77327	120316
L. Turkana	10529	10849	11040	12033	10113	13552
L. Naivasha	289	2531	411	5735	692	9379
L. Baringo	467	617	401	768	352	684
L. Jipe	340	981	409	1194	463	1262
L. Chala	110	314	90	288	10	63
Fish Farming	421	23747	440	23818	585	15880
Other areas	1070	2861	268	1700	1526	5442
TOTAL	51385	127246	74017	168936	91068	166577
Marine Fish						
Lamu	1393	4764	1298	5371	1346	5416
Tana River	69	244	26	109	22	97
Kilifi	801	4294	1284	7433	1070	8474
Mombasa	1860	11206	2330	172218	1854	15268
Kwale	810	4534	734	4769	818	15268
Sport fishing	613	4690	94	418	148	666
Others	-	-	844	5670	540	7561
TOTAL	5546	29731	6622	40988	5798	41249
Crustaceans						
Lamu	91	1103	83	562	69	1453
Tana River	8	66	4	29	3	34
Kilifi	40	636	33	798	35	1059
Mombasa	180	3794	234	5570	302	7201
Kwale	65	1159	72	1298	65	1031
TOTAL	384	6763	426	8257	474	10778
Other Marine Products						
Lamu	7	19	7	34	2	35
Tana River	-	-	-	-	-	-
Kilifi	10	26	14	70	19	17
Mombasa	10	198	37	37	1470	3958
Kwale	10	43	10	32	15	14
TOTAL	37	286	68	1606	121	4084
GRAND TOTAL	57352	164026	81133	219787	97461	222688
Retail Price	-	449002	-	657163	-	757115

TABLE II: EXPORT OF FISH AND FISH PRODUCTS IN 1982-1983 (QUANTITY - Q TONNES)
(VALUE - V KSHS '000)

CATEGORIES	SINGAPORE		ZAIRE		NETHERLANDS		FRANCE		OTHERS		TOTAL		QTY
	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	
1982													
Live fish	—	—	—	—	50.6	1261	15.8	447	26.3	995	92.7	2733	10.2
Fresh fish or chilled fillets	—	—	—	—	—	—	—	—	39.5	94	39.5	94	4.3
Fresh fish (excluding fillets)	—	—	8.0	178	12.4	2354	—	—	0.2	16	21.6	428	2.4
Fresh fillets	—	—	—	—	—	—	—	—	8.0	432	8.0	432	0.9
Frozen fillets	5.6	356	—	—	—	—	49.3	1008	8.0	432	406.7	6808	44.6
Fish meal (fit for human consumption)	2.3	208	—	—	—	—	—	—	1.7	89	4.0	286	0.4
Cod (not in fillets, dried salted or not)	—	—	20.0	142	—	—	—	—	0.1	1	20.0	143	2.2
Dried fish (other than cod salted or in brine)	13.6	1,476	108.8	923	—	—	—	—	13.6	272	137.3	2670	15.1
Smoked fish	—	—	—	—	—	—	—	—	7.4	479	7.4	479	0.8
Fresh Crustaceans & Molluscs	7.7	830	—	100	—	—	—	—	1612	6,321	168.9	7,151	18.5
Prepared & Preserved fish and Caviar	—	—	—	—	—	—	—	—	1.2	161	1.2	162	0.1
Prepared & Preserved Crustaceans & Molluscs	4.3	172	0.1	—	—	—	—	—	0.1	13	4.4	185	0.5
	33.5	3,042	138.8	1,343	63.0	1,496	65.1	1,456	61.1	1,417	911.7	2168.2	100
1983													
Live fish	—	—	—	—	107.1	1,581	72.5	194	74.2	4,090	252.8	5,865	67.6
Fresh fish or chilled fillets	—	—	—	—	—	—	—	—	285.5	6,460	285.5	6,460	7.6
Frozen fish (excluding fillets)	—	—	—	—	—	—	—	—	0.3	45	0.3	45	0.1
Fresh fillets	—	—	—	—	—	—	—	—	9.0	747	9.0	747	0.2
Frozen fillets	—	—	—	—	8.0	214	—	—	21.92	227	22.72	441	6.1
Fish meal (fit for human consumption)	1.0	145	—	—	—	—	1.0	39	0.9	24	2.9	208	0.1
Cod (not in fillets, dried salted or not)	—	—	—	—	—	—	—	—	0	0	0	—	0
Dried fish (other than cod salted or in brine)	29	2,002	—	—	—	—	—	—	178	1,672	207	3,674	5.5
Smoked fish	—	—	—	—	—	—	—	—	212.2	4,016	212.2	4,016	5.7
Fresh Crustaceans & Molluscs	28.2	1,901	—	—	—	—	—	—	235.4	6,827	263.6	8,722	7.0
Prepared and preserved fish and Caviar	—	—	—	—	—	—	—	—	1.1	34	1.1	34	0.03
Prepared and Preserved Crustaceans and molluscs	—	—	—	—	—	—	—	—	2.6	201	2.6	201	0.07
	58.2	4,048	—	—	115.1	1,795	73.5	233	96.14	2,433.7	3740.2	30382.4	100

SOURCE: Kenya Customs and Excise Department.

TABLE III IMPORTS OF FISH AND FISH PRODUCTS IN 1982-1983 (QUANTITY - Q TONNES)
(VALUE - V KSHS. '000)

CATEGORIES	SOMALIA		SUDI ARABIA		NETHERLANDS		SINGAPORE		OTHERS		TOTAL		QUANTITY
	Q	V	Q	V	Q	V	Q	V	Q	V	Q	V	
1982													%
Live fish	—	—	—	—	0.2	—	—	—	0.1	13	0.3	53	0.08
Fresh fish or chilled filets	1.2	5	—	—	2.4	40	—	—	—	—	3.6	45	0.4
Frozen fish (including filets)	2.5	10	—	—	—	—	—	—	—	—	2.5	10	0.3
Fresh filets	—	—	—	—	—	—	—	—	—	—	—	—	—
Frozen filets	—	—	—	—	—	—	—	—	—	—	—	—	—
Fish meal (fit for human consumption)	1.2	23	—	—	—	—	—	3.6	144	4.8	167	0.5	0.5
Cod (not in filets dried salted or not)	25.9	91	—	—	—	—	—	—	—	25.9	91	2.2	2.2
Dried fish (other than cod, salted or in brine)	109.6	416	50.1	322	—	—	—	18.4	7	178.1	745	19.5	19.5
Smoked fish	—	—	—	—	—	—	—	—	—	—	—	—	—
Fresh Crustaceans and molluscs	0	1	—	—	—	—	—	0	0	0	1	0	0
Prepared and Preserved fish caviar	—	—	—	—	—	—	—	—	—	—	—	—	—
Prepared & preserved Crustaceans & Molluscs	—	—	—	—	—	—	—	0.2	6	0.2	6	0.02	0.02
Fish meal (unfit for human consumption)	—	—	—	—	—	—	—	666.6	4622	666.6	4622	70.0	70.0
	140.4	545	50.1	322	2.6	80	—	744.9	5632	938.1	6580	100	100
1983													
Live fish	—	—	—	—	0.3	32	—	—	0.4	35	0.7	57	0.09
Fresh fish or chilled filets	—	—	—	—	—	—	—	—	0	—	0	—	0
Frozen fish (excluding filets)	—	—	—	—	—	—	—	—	0	—	0	—	0
Fresh filets	—	—	—	—	—	—	—	—	0	—	0	—	0
Frozen filets	—	—	—	—	—	—	—	—	0	—	0	—	0
Fish meal (fit for human food)	—	—	—	—	—	—	—	—	0	—	0	—	0
Cod (not in filets dried salted or not)	—	—	—	—	—	—	—	—	—	—	—	—	—
Dried fish (other than cod) salted or in brine	154.8	597	—	—	—	—	—	36.7	148	181.5	745	11.8	11.8
Smoked fish	—	—	—	—	—	—	—	—	—	—	—	—	—
Fresh Crustaceans & Molluscs	—	—	—	—	—	—	—	—	—	—	—	—	—
Prepared & Preserved fish - Caviar	—	—	—	—	—	—	—	324.6	1,829	—	—	—	—
Prepared & Preserved Crustaceans & Molluscs	—	—	—	—	—	—	—	1.4	29	326	1,858	20.1	20.1
Fish meal (unfit for human consumption)	—	—	—	—	—	—	—	0	2	0.1	2	0.01	0.01
	154.8	597	—	—	0.3	32	324.6	1,829	1,099	9147	1,099	9147	68.0

SOURCE: Kenya Customs and Excise Department.