

REPUBLIC OF KENYA



MINISTRY OF AGRICULTURE, LIVESTOCK AND FISHERIES



STATE DEPARTMENT OF FISHERIES



FISHERIES ANNUAL STATISTICAL BULLETIN 2014

TABLE OF CONTENTS

TABLE OF CONTENTS	2
LIST OF TABLES	3
LIST OF FIGURES.....	4
1.0 INTRODUCTION.....	5
2.0 NATIONAL FISH PRODUCTION.....	7
3.0 CAPTURE FISHERIES.....	14
3.1 LAKE VICTORIA FISHERY	14
3.2 MARINE CAPTURE FISHERY	21
3.3 LAKE TURKANA FISHERY	31
3.4 LAKE BARINGO FISHERY	35
3.5 LAKE NAIVASHA FISHERY.....	37
3.6 LAKE JIPE FISHERY	41
3.7 TANA RIVER DAMS FISHERY.....	42
3.8 LAKE KENYATTA FISHERY.....	44
3.9 LAKE KANYABOLI FISHERY.....	46
3.10 TAKWEL DAM.....	47
3.11 TANA RIVER DELTA.....	49
4.0 AQUACULTURE (FISH FARMING).....	51
5.0 EXPORTS OF FISH AND FISHERY PRODUCTS.....	53
6.0 IMPORTS OF FISH AND FISHERY PRODUCTS.....	56

LIST OF TABLES

<i>Table 1 Fish landings by Weight, Value, Number of Fishers, Ponds and fishing Crafts 2014 ...</i>	11
<i>Table 2: Quantity and Value of fish landings 2012 – 2014</i>	12
<i>Table 3: Fresh Water and Marine fish catches by Species, Weight and Value 2012- 2014</i>	13
<i>Table 4: Lake Victoria fish landings by Species, Weight and Value 2012 – 2014</i>	18
<i>Table 5: Lake Victoria Monthly fish landings by Species, Weight (M. tonnes) and Value ('000 Kshs) 2014</i>	19
<i>Table 6: Lake Victoria Annual fish landings by Species, Weight, Value and by Counties 2014</i>	20
<i>Table 7: Marine monthly fish landing by Species, Weight and Value 2014</i>	27
<i>Table 8: Marine fish landing by Species, Weight and Value and by Counties 2014</i>	29
<i>Table 9: Lake Turkana fish landings by Species, Weight and Value 2014</i>	34
<i>Table 10: Lake Turkana Monthly fish landings by Weight and Value 2014</i>	34
<i>Table 11: Lake Baringo Monthly fish landings by Species, Weight and Value 2014</i>	36
<i>Table 12: Lake Naivasha Monthly fish landings by Species, Weight and Value 2014</i>	40
<i>Table 13: Lake Jipe Monthly fish landings by Species, Weight and Value 2014</i>	42
<i>Table 14: Tana River dams Monthly fish landings by Species, Weight and Value 2014</i>	44
<i>Table 15: Lake Kenyatta Monthly fish landings by Species, Weight and Value 2014</i>	45
<i>Table 16: Lake Kanyaboli Monthly fish landings by Species, Weight and Value 2014</i>	47
<i>Table 17: Turkwel dam Monthly fish landings by Species 2014</i>	49
<i>Table 18: Tana River delta freshwater monthly fish landings by Species 2014</i>	50
<i>Table 19: Exports of Fish and Fishery Products 2014</i>	56
<i>Table 20: Imports of Fish and Fishery Products 2014</i>	58

LIST OF FIGURES

<i>Figure 1: Fish production by quantity and value 2005-2014</i>	8
<i>Figure 2: National fish production by Fishery Category 2014</i>	9
<i>Figure 3: Lake Victoria species catch composition 2005-2014</i>	15
<i>Figure 4: Lake Victoria species catch composition 2014</i>	16
<i>Figure 5: Lake Victoria fish landings by Counties 2014</i>	16
<i>Figure 6: Trends of marine fish production by quantity and value 2005-2014</i>	22
<i>Figure 7: Percentage contribution of marine fish species groups 2014</i>	23
<i>Figure 8: Trends of landings of marine fish species groups 2012-2014</i>	24
<i>Figure 9: Marine fish production by Quantity, Value and Counties 2014</i>	25
<i>Figure 10: Trends in annual fish landings from Lake Turkana fishery 1991-2014</i>	32
<i>Figure 11: Species composition in catches of Lake Turkana Fishery 2014</i>	33
<i>Figure 12: Percentages catch by species composition in Lake Baringo in 2014</i>	36
<i>Figure 13: Lake Naivasha species composition landings in metric tonnes 2014</i>	38
<i>Figure 14: Lake Naivasha monthly catches in metric tonnes 2014</i>	39
<i>Figure 15: Percentages composition of species catch in Lake Jipe 2014</i>	41
<i>Figure 16: Tana River dams' fish catch trends in metric tonnes 2005 – 2014</i>	43
<i>Figure 17: Percentages composition of species catch in Lake Kenyatta 2014</i>	45
<i>Figure 18: Percentages composition of species catch in Lake Kanyaboli 2014</i>	46
<i>Figure 19: Percentages composition of species catch in Takwel dam 2014</i>	48
<i>Figure 20: Takwel dam monthly fish catches in metric tonnes 2014</i>	48
<i>Figure 21: Percentages composition of species catch in Tana river delta 2014</i>	50
<i>Figure 22: Aquaculture production for last ten years (2005-2014)</i>	52
<i>Figure 23: Exports of Nile Perch Products by destinations- 2014</i>	54
<i>Figure 24: Exports of Nile perch by product type 2014</i>	55
<i>Figure 25: Import of fish and fish products 2014</i>	57

1.0 INTRODUCTION

Availability of timely, quality data is a major problem facing many developing countries including Kenya. In Kenya, the agricultural sector, and Fisheries in particular, experiences numerous challenges regarding availability of timely, reliable data. The need for reliable data to support planning, development of evidence-based policy and decisions for effective management of the fisheries sector cannot be undermined.

In Kenya, most of the fisheries functions have been devolved to County governments. However, management of national data and statistics, particularly fisheries production from Inland, Marine waters and Aquaculture remains core responsibility of the national government. In Kenya, most of the fisheries data are collected by field extension officers who are deployed at the field level by County governments. Ideally, it is these County field data and reports that are expected to feed into and sustain the national statistical system. Regarding timely data collection, devolution process has resulted in lack of clarity of the communication procedures between national and county officials responsible for data management. Moreover, the specific roles of the National and County governments in data collection have not been elaborated, negotiated and agreed upon. However, lessons from countries with similar devolved systems indicate that in general, it is the national government that is expected to play the greatest role in managing national data and statistics. In particular, it is up to the national government to provide harmonized guidelines, standards and vision for data collection and management; allocate resources of procurement of similar tools, equipment as well as common ICT and web-based database management systems; undertake regular capacity building of the extension officers, among other activities.

The major sources of capture and aquaculture data (including prices) are Fisher folks dealing with marine and inland fishing such as Beach Management Units (BMUs); Aquaculture farmers, County Directors of Fisheries in the various counties, Kenya Marine and Fisheries Research Institute, Kenya National Bureau of Statistics (KNBS), Association of Fish Processors and Exporters of Kenya (AFIPEK), Government and County fish farms and hatcheries, Fish and fish products markets.

Main challenges facing fisheries data collection and management in Kenya include:-

- i. Lack of awareness of the true values of fisheries data and statistics

- ii. Inadequate planning and resource allocation (human and financial) at both national and County level to support timely, quality data collection and management;
- iii. Lack of fisheries statistics policy and strategy;
- iv. Low skills amongst officers dealing with data and statistics. In the fisheries sector, because most officers dealing with data and statistics are not trained statisticians; they need targeted trainings and demonstrations in applied statistics such as basic stock assessment to be able to competently handle data and statistics. In addition, data, statistics and information management are evolving subjects with new ideas and technologies being generated globally thus require regular refresher trainings.
- v. Devolution: poor communication process between national and county governments. While most fisheries functions have been devolved, management of national statistics is not. This is not well understood by governments of some Counties and has rendered sharing of data at the two levels of government impossible;
- vi. Low use of modern technology of data collection and management at both national and County levels;
- vii. Lack of basic tools and equipment to facilitate field level data collection e.g weighing scales at landing sites;
- viii. Lack of clear means of data archiving and back-up;
- ix. At national level: data is scattered in various directorates ie Aquaculture, marine and Inland. There is need to have a common vision to guide and harmonize data collection for the entire State Department of Fisheries and populate this data in a database.

On fisheries data exchange, the State Department has active collaborative initiatives with various organizations. Due to the fact that some of the most important fisheries in the country are Tran-boundary, as a result there are strong mechanisms of data sharing with the aim of fostering better management of the shared fisheries resources. The department thus exchanges data with regional bodies such as the Lake Victoria Fisheries Organization (LVFO). Data exchange with this organization is wide ranging encompassing all aspects of fisheries. LVFO is also involved in setting benchmarks of data collections protocols by issuing standard operating procedures in data collection and analysis so that the data thus collected can be compared across the shared water body regardless of the country.

Such data exchange initiatives are also extended to the Indian Ocean Tuna commission (IOTC) which deals mainly with highly migratory tuna and tuna like species. The department also makes submissions to FAO statistical year books as well as for the annual economic survey reports by Kenya National Bureau of Statistics.

NB

The following symbols have been used in the tables in this Bulletin:

- 0 Meaning Nil
- * Meaning the value was less than half of the unit used
- Meaning no data was available

2.0 NATIONAL FISH PRODUCTION

Kenya is endowed with both marine and inland water resources. The inland water resources include lakes, dams and rivers of varying sizes. Some of the major lakes include: Lake Turkana (6,405 Km²), Lake Victoria-Kenyan side (6% of the whole lake =4,128 km²), Naivasha (210 Km²), Baringo (129 Km²), and Lake Jipe (39 Km²). Major rivers include Tana (700 Km), Athi/Galana/Sabaki (530 Km), Ewaso-Ngiro-North (520 Km), Kerio (350 Km), Suam-Turkwel (350 km), Mara (280 km), Nzoia (240 km), Voi (200 km), Yala (170 km), Ewaso-Ngiro-south (140 km), Sondu (105 km), Malewa (105 km) and Kuja (80 km).

Further to these inland water resources, Kenya also enjoys a vast coastline of 640 km on the Western Indian Ocean, besides a further 200 nautical miles Exclusive Economic Zone (EEZ) under Kenyan jurisdiction. The country's coast is also located within the richest tuna belt in the South West Indian Ocean.

The Kenyan fishery is mainly artisanal with very few commercial/industrial vessels targeting mainly shrimps and several tens of purse seines and long liners owned by Distant Water Fishing Nations (DWFN) which operate under Kenyan license in our Economic Exclusive Zone (EEZ) targeting Tuna and Tuna like species. The artisanal fishery accounts for almost all the inland and marine water catches reported in this bulletin and consequently it is currently the most important fishery in the country, even though our EEZ which is predominately for commercial fishing is under exploited with an estimated potential of between 150,000 to 300,000 metric tonnes (Commonwealth secretariat report 2003 by Dr. George Habib).

The fisheries sector plays a significant role in employment and income generation. During the year under review the sector supported a total of 61,311 people directly as fishermen and 73,839 fish farmers with 69,688 stoked fish ponds. The sector supports about 1.2 million people directly and indirectly, working as fishers, traders, processors, suppliers and merchants of fishing accessories and employees and their dependents. Besides being a rich source of protein especially for riparian communities, the sector is also important for the preservation of culture, national heritage, and recreational purposes.

During the year (2014) under review, fish production from Inland, Aquaculture and Marine artisanal fisheries amounted to 168,413 metric tonnes with an ex-vessel and farm gate value of Kshs. 22,381,573,000 (Table 1). This was an increase of 3.1% in quantity and 5.2% in ex-vessel and farm gate value compared with 2013 figures of 163,293 metric tonnes with an ex-vessel value of Kshs. 21,283,592,000. The small increase in quantity can mainly be attributed to increase in production of fish from Lake Victoria and Tana river dams which during the same period increased by 3.3% and 5.4% respectively (Table 2). The increase in production from Lake Victoria was attributed to the increase in *Rastrineobola argentea* (Omena) and *Oreochromis niloticus* production which increased by 4.3% and 6.5% respectively during the same period (Table 3). But generally fish production has been on gradual increase since 2007 fetching higher and higher ex-vessel value year after year, figure 1.

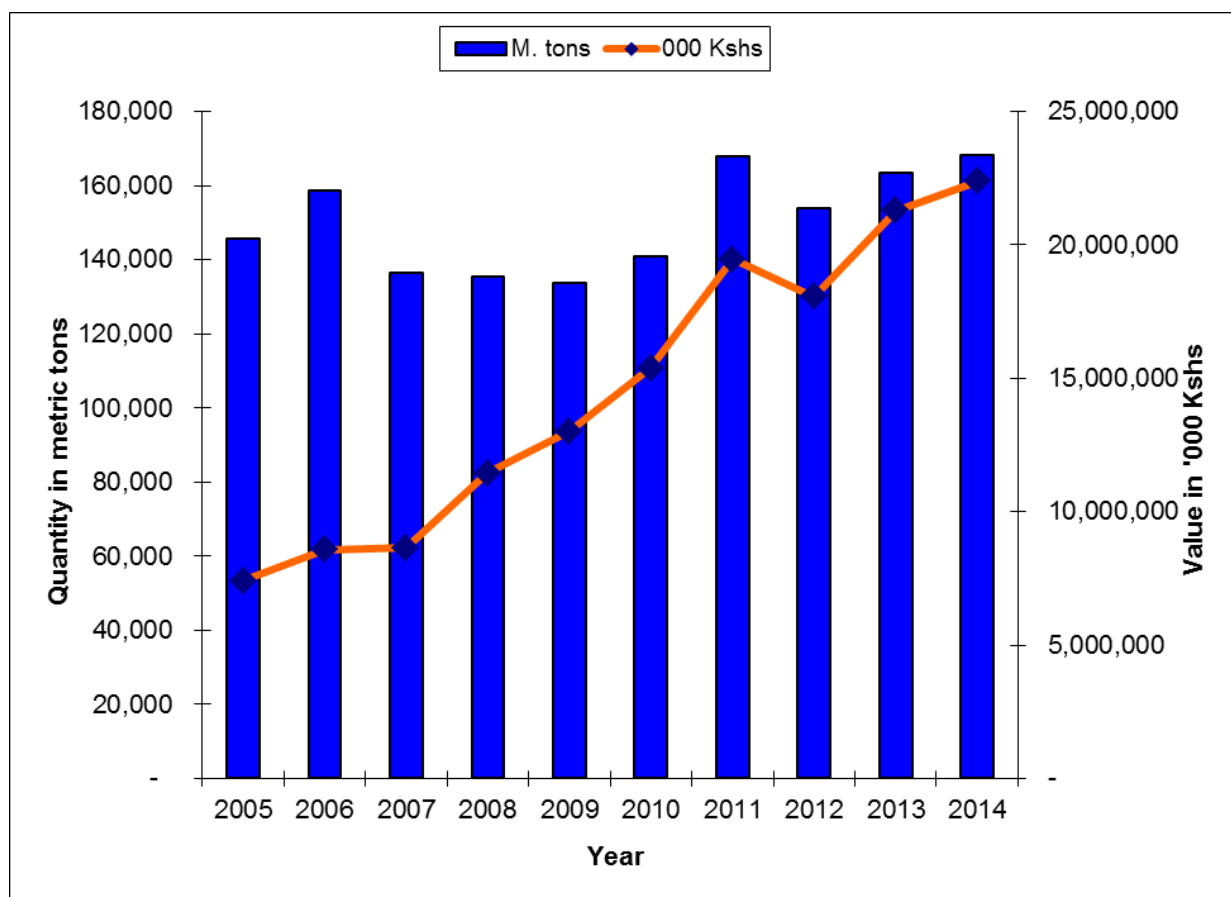


Figure 1: Fish production by quantity and value 2005-2014

Inland capture fisheries contributed 80.3% of Kenya's total fish production, with the principal fishery being that of Lake Victoria. The lake accounted for 128,708 metric tonnes or 76.4% of the country's total annual fish production in 2014. Lake Turkana, Kenya's largest freshwater body (7,400 km²) produced 4,166 metric tonnes of fish during the year under review. Other freshwater-bodies of

commercial importance included lakes Baringo (302 MT), Naivasha (633 MT), Kanyaboli (134 MT), Jipe (115 MT), Kenyatta (51 MT), the Tana River dams (1,024 MT), Takwel dam (56 MT), the Tana River delta (47 MT) and Riverine fishery (8 MT). Marine artisanal fish production was 9,073 metric tonnes equivalent of 5.4% of the national production while aquaculture production amounted to 24,096 metric tonnes contributing 14.3% of the total production, figure 2. Aquaculture earned fish farmers Kshs. 5,601,722,318 during the year under review.

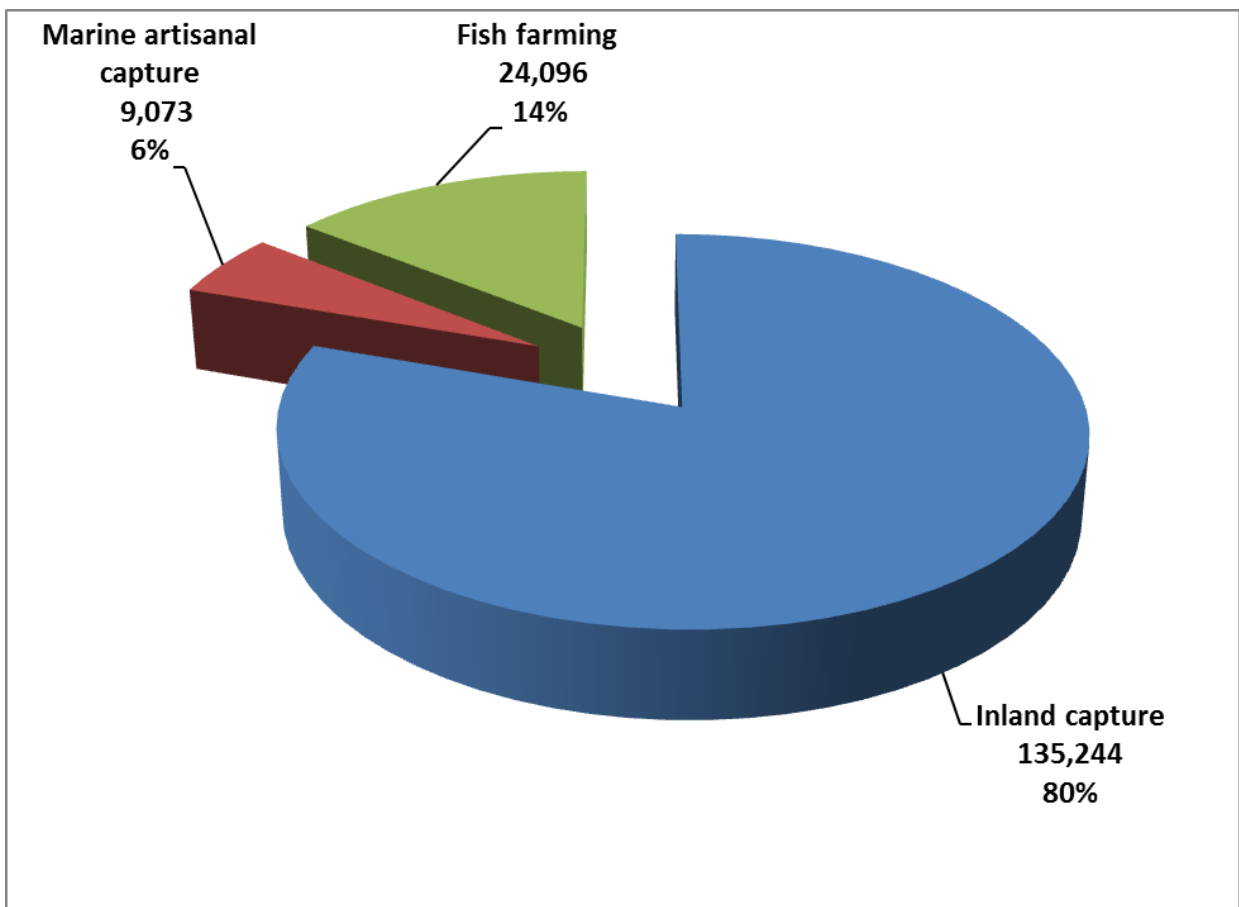


Figure 2: National fish production by Fishery Category 2014

The fish and fish products produced in the country are marketed domestically or exported to the international markets. The main fish and fishery products exported during the year under review included Nile perch products (fillets, maws, headless and gutted whole Nile perch), Octopus, Fish meal and marine shells. Fish and fishery products imported into the country included the following products among others: frozen Mackerels, frozen Tilapia, frozen Tilapia fillets, frozen Sardines, frozen Pangasius fillets and Tuna fish meals among others.

Table 1 Fish landings by Weight, Value, Number of Fishers, Ponds and fishing Crafts 2014

Fresh water	M. tons	000 Kshs.	Fishers	Farmers	Crafts	Ponds
Lake Victoria	128,708	14,601,790	40,113		13,402	
Lake Turkana	4,166	433,790	7,000		1650	
Lake Baringo	302	86,595	120		47	
Lake Naivasha	633	68,070	150		50	
Lake Jipe/Dams	115	19,249	66		46	
Lake Kanyaboli	134	10,466	188		99	
Lake Kenyatta	51	3,899	120		40	
Tana River dams	1,024	98,311	316		180	
Turkwel dam	56	11,547				
Fish Farming	24,096	5,601,722		73,839		69,688
Tana River delta	47	3,574	299		93	
Riverine	8	1,894				
Total	159,340	20,940,907	48,372	73,839	15,607	69,688
Marine water				2016 projection 52,360		
Dermersal	4,519	603,235				
Pelagic	2,506	347,725				
Other Marine	847	121,318				
Crustaceans	555	243,032				
Molluscs	646	125,356				
Total Marine	9,073	1,440,666	12,915		2,913	
Grand Total	168,413	22,381,573	61,287	73,839	18,520	69,688
	M. tons	000 Kshs.	% Quantity	% Value		
Inland Capture	135,244	15,339,185	80.3	68.5		
Marine Caprure	9,073	1,440,667	5.4	6.4		
Aquaculture	24,096	5,601,722	14.3	25.0		
Total	168,413	22,381,574	100	100		

Table 2: Quantity and Value of fish landings 2012 – 2014

	2012		2013		2014	
	M. tons	000 Kshs	M. tons	000 Kshs	M. tons	000 Kshs
FRESH WATER						
L. Victoria	118,992	11,775,377	124,643	13,858,682	128,708	14,601,790
L. Turkana	3,001	307,382	4,338	438,646	4,166	433,790
L. Naivasha	143	15,460	231	17,542	633	68,070
L. Baringo	251	23,514	263	25,008	302	86,595
L. Jipe/Dams	112	16,715	116	16,910	115	19,249
Lake Kanyaboli	125	8,479	194	12,004	134	10,466
Lake Kenyatta	33	2,182	54	3,770	51	3,899
Tana River Dams	967	81,609	705	73,024	1,024	98,311
Turkwel dam	-	-	59	11,849	56	11,547
Fish Farming	21,487	4,633,634	23,501	5,522,735	24,096	5,601,722
Tana delta	39	2,409	46	3,204	47	3,574
Riverine	-	-	9	2,046	8	1,894
TOTAL	145,150	16,866,761	154,159	19,985,420	159,340	20,940,907
MARINE FISH						
Lamu County	2,062	170,483	2,147	177,666	2,227	203,119
Tana River County	596	43,979	698	66,158	312	36,969
Kilifi County	2,061	335,820	2,136	319,831	2,154	346,560
Mombasa County	782	129,236	855	158,104	996	204,781
Kwale County	1,976	198,066	1,867	222,039	2,183	280,849
TOTAL	7,477	877,584	7,703	943,798	7,872	1,072,278
CRUSTACEA						
Lamu County	132	69,905	215	113,073	174	92,777
Tana River County	129	21,654	68	10,747	62	28,828
Kilifi County	164	64,125	93	32,407	49	21,314
Mombasa County	207	48,374	247	57,717	164	53,224
Kwale County	108	29,195	140	36,907	106	46,889
TOTAL	739	233,253	762	250,851	555	243,032
MOLLUSCS						
Lamu County	86	19,842	90	36,889	55	18,163
Tana River County	18	1,563	37	2,402	25	2,745
Kilifi County	178	28,335	116	14,681	153	30,439
Mombasa County	77	11,494	74	9,048	59	10,965
Kwale County	289	35,026	351	40,503	354	63,044
TOTAL	649	96,260	669	103,523	646	125,356
MARINE TOTAL	8,865	1,207,098	9,134	1,298,172	9,073	1,440,666
GRAND TOTAL	154,015	18,073,859	163,293	21,283,592	168,413	22,381,573

Table 3: Fresh Water and Marine fish catches by Species, Weight and Value 2012- 2014

	2012		2013		2014	
FRSH WATER	M. tons	000 Kshs	M. tons	000 Kshs	M. tons	000 Kshs
Alestes	276	23,456	329	27,359	318	26,871
Bagrus	49	4,123	105	8,550	101	8,398
Barbus	10	848	94	8,443	101	10,777
Black bass	2	100	1	133	3	461
Clarias	6,596	1,048,549	6,918	1,196,823	7,174	1,252,514
Rastreonobola	52,948	2,813,882	66,717	3,552,513	69,561	4,129,707
Labeo	480	40,263	659	60,785	622	61,135
Haplochromis	723	63,272	1,126	85,212	929	73,211
Lates niloticus	53,023	7,547,723	44,319	8,589,887	43,399	8,473,050
Protopterus	1,196	95,886	1,318	115,852	1,339	158,834
Synodontis	15	1,283	141	11,885	136	11,672
Tilapia niloticus	22,196	4,525,560	25,071	5,531,254	26,278	5,746,526
Tilapia others	1,935	190,740	2,395	253,577	2,612	300,187
Trout	215	118,177	235	140,853	241	142,943
Carps	1,727	155,993	1,920	182,300	2,083	202,237
Eels	1	114	-	-	-	-
Citharinus	14	1,188	120	14,118	116	13,866
Hydrocynus	60	5,121	109	9,826	106	9,650
Distichodu niloticus	298	25,289	330	34,562	319	33,946
Unspecified	3,386	205,194	2,251	161,488	3,903	284,922
TOTAL	145,150	16,866,761	154,159	19,985,420	159,340	20,940,907
MARINE FISH						
Demersal	4,300	486,451	2,147	177,666	4,519	603,235
Pelagic	2,297	288,152	698	66,158	2,506	347,725
Sharks/Rays	373	46,064	2,136	319,831	293	48,085
Sardines	194	17,449	855	158,104	239	32,056
Unspecified	313	39,468	1,867	222,039	314	41,178
TOTAL	7,477	877,584	7,704	943,799	7,871	1,072,279
CRUSTACEA						
Spiny Lobster	96	94,255	123	114,952	107	108,857
Prawns	408	83,747	365	77,752	269	87,484
Crabs	235	55,251	274	58,146	180	46,691
TOTAL	739	233,253	762	250,851	555	243,032
MOLLUSCS						
Oysters	74	6,942	32	2,179	35	1,395
Beche-de-mers	36	18,676	48	35,296	24	18,575
Octopus	394	49,402	446	45,899	437	70,714
Squids	144	21,241	143	20,149	151	34,673
TOTAL	649	96,260	669	103,523	646	125,356
TOTAL MARINE	8,865	1,207,098	9,135	1,298,173	9,073	1,440,667
GRAND TOTAL	154,015	18,073,858	163,294	21,283,593	168,413	22,381,574

3.0 CAPTURE FISHERIES

Capture fisheries in Kenya is mainly from lakes Victoria, Turkana, Naivasha, Baringo, Jipe, Tana River dams, Tana river delta and Indian Ocean and it accounted for 85.7% of the country's total fish production in 2014 slightly up from 86.6% the previous year. In 2014 capture fisheries fish production was 144,317 metric tons compared to 139,792 metric tonnes in 2013. Lake Victoria accounted for 89.18% of all the fish from capture fisheries in Kenya during the year under review. Lake Turkana contributed 2.89%, Tana river dams 0.71%, Lake Baringo 0.21%, Lake Naivasha 0.44%, Lake Kanyamboli 0.09%, Lake Jipe 0.08% , Lake Kenyatta 0.04%, Tukwel dam 0.04%, Tane river delta 0.01%, Riverine 0.01% while marine artisanal fisheries contributed 6.29% of all the fish from capture fisheries.

In capture fisheries, gill netting was the most used fishing method during the year. The other methods included use of gears such as long line hooks, hand line, traditional traps, trolling, ring nets, cast nets and small (mosquito) seines for *Rastrineobola argentea* fishing. There are other methods which were used but are currently prohibited due to their destructive nature. They include; Beach seining, Monofilament gill netting, Trawl netting, Scuba diving, spear gunning and vertical integration of gears.

3.1 LAKE VICTORIA FISHERY

Lake Victoria's contribution to total national annual fish production is enormous (76.4% in 2014) even in the face of rapidly declining fish stocks in the lake. Capture fisheries of Lake Victoria are a source of livelihood to many people employed directly as boat owners, fishermen (40,137), fish traders, fish processors, etc and indirectly as fishing gear manufacturers, boat builders, and ice producers among others. Lake Victoria is a multi-species fishery with hundreds of known species, but only *Rastrienobola argentea* (Omena), *Lates niloticus* (Nile perch), and *Oreochromis niloticus* (Nile tilapia) are of economic significance which contributed 93.5% of total catches from the lake (Kenyan side) during the year under review (Tables 4, 5 and 6). This has been the case for a number of years, figure 3 and table 4. However, for the last few years there have seen a rapid decline of fish stocks in Lake Victoria thereby creating a wide gap between supply and demand for fish in the country. In response to this undesirable situation, the government has taken concrete steps to promote aquaculture development in the country. It introduced and implemented the Fish Farming Enterprise Productivity Program (FFEPP) to bridge the existing supply-demand gap.

During the year 2014, fish production from Lake Victoria increased to 128,708 metric tonnes with an ex-vessel value of Kshs 14,601,790,000 compared to 124,643 metric

tonnes with an ex-vessel value of Kshs 13,858,682,000 landed in 2013. This year's figures translate into an increase of 3.3% in quantity and 5.4% in ex-vessel value of compared to the previous year. For the three species of commercial value, *Lates niloticus*' production decreased by 2.1% while *Rastrienobola argentea* and *Oreochromis niloticus* increased by 4.3% and 6.5% respectively compared to the previous year. In terms of species contribution to the total weight of fish landed from the lake, *Rastrienobola argentea* took the lead with 54.0%, *Lates niloticus*, 33.3%, *Oreochromis niloticus*, 6.2%, *Clarias spp*, 1.9%, *Protopterus aethiopicus*, 0.9%, *Haplochromis*, 0.7% and the others species combined contributed 3.0%, figure 4. Homa bay County contributed 63.2% of the total landings, Siaya 22.1%, Migori 6.1%, Kisumu 4.3% and Busia 4.2%, figure 5 and table 6.

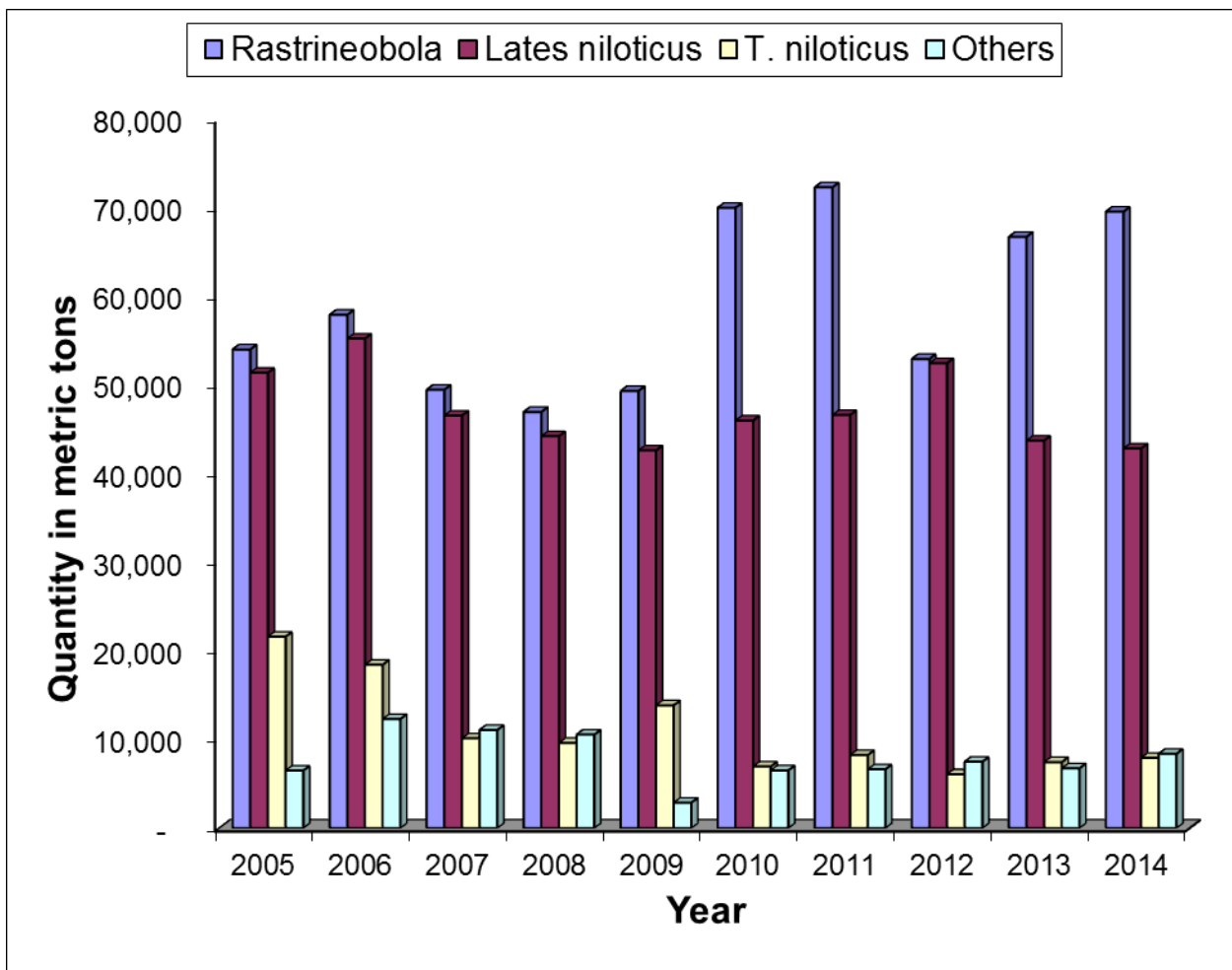


Figure 3: Lake Victoria species catch composition 2005-2014

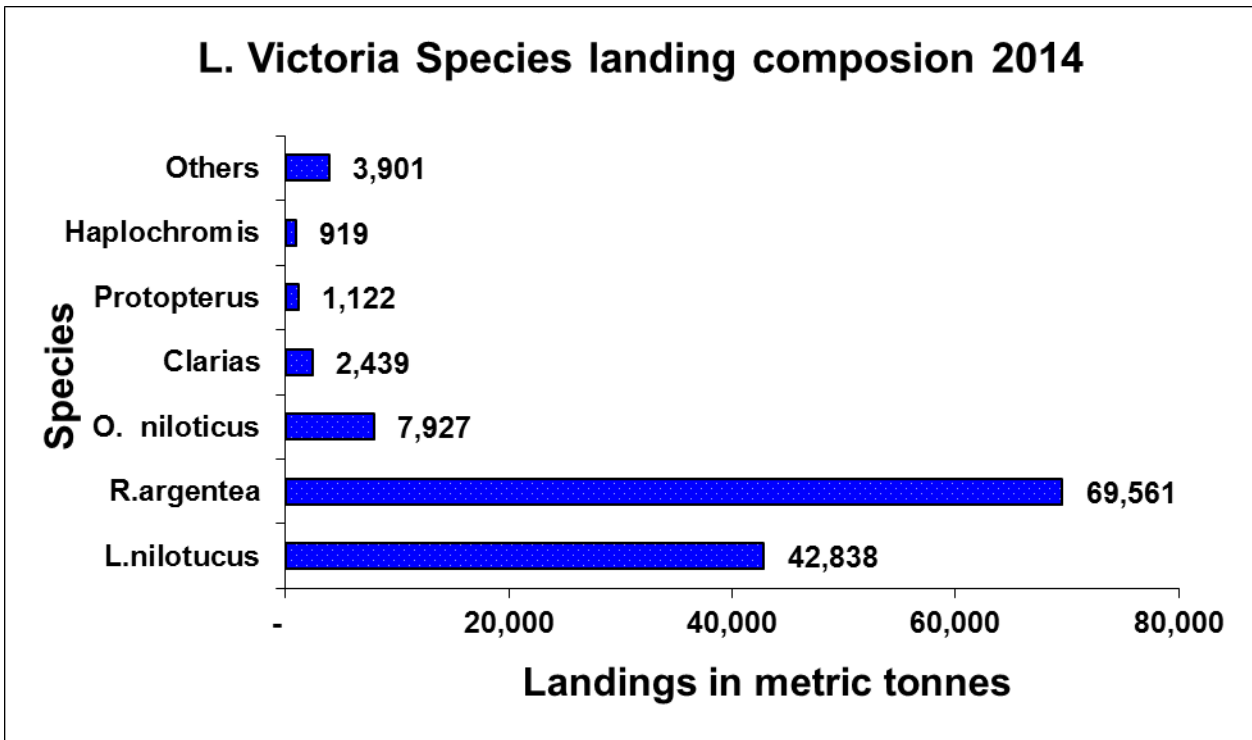


Figure 4: Lake Victoria species catch composition 2014

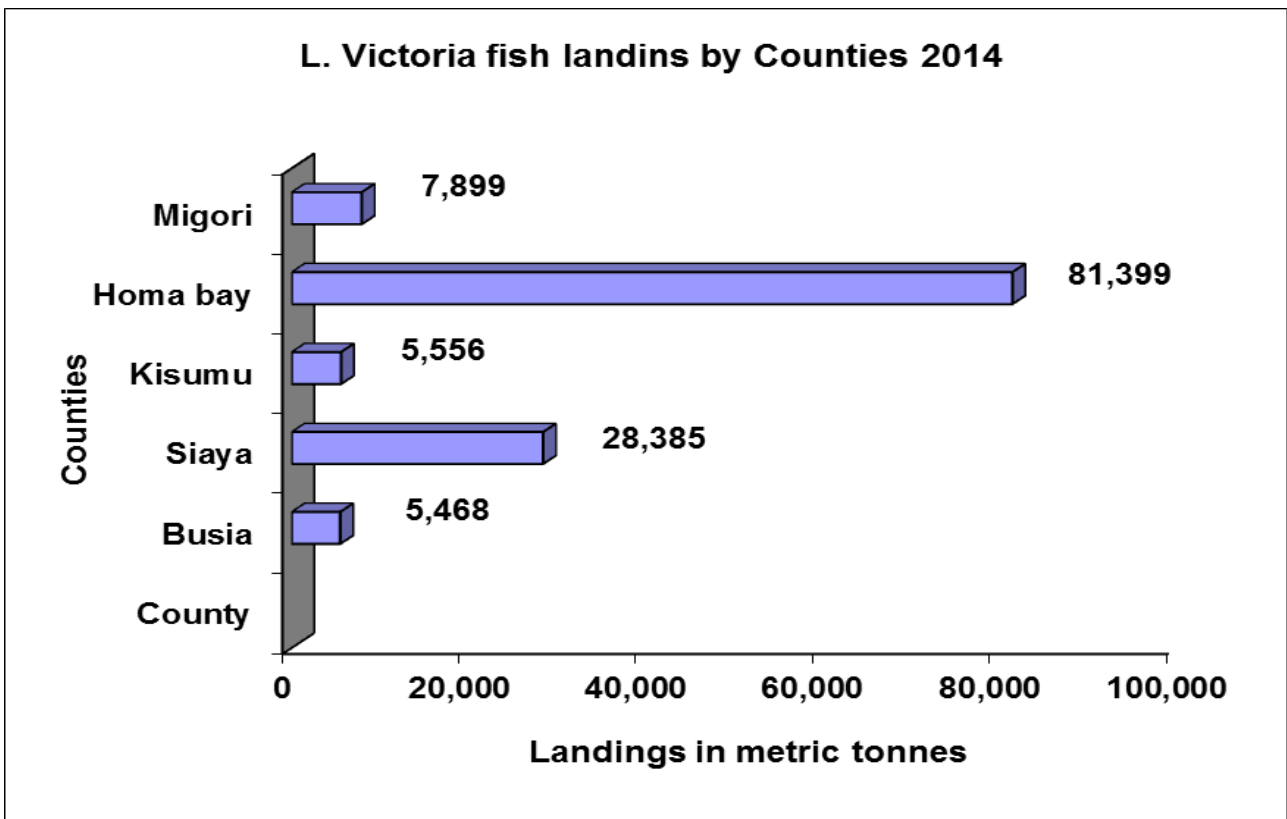


Figure 5: Lake Victoria fish landings by Counties 2014

Challenges facing Lake Victoria fishery:

- i. The declining trend in species fish catches apart from *Rastrineobola argentea* and *Oreochromis niloticus*, an indicator of reduced fish stocks particularly *Lates niloticus* in Lake Victoria;
- ii. Infestation of the lake by aquatic weeds i.e. Water Hyacinth and the Hippo grass;
- iii. The major challenge afflicting the fisheries of Lake Victoria is still mainly attributed to over fishing and habitat degradation. These have had adverse impacts to the fishery by changing the species diversity and reduction in total harvestable biomass;
- iv. Increase in illegal fishing gears and methods;
- v. Lack of appropriate fish handling and preservation facilities that usually lead to post-harvest losses and poor quality of fish and fishery products;
- vi. Weak and unfavorable fish marketing systems along the fish landing sites leading to poor prices and therefore resource deterioration;
- vii. Inadequate resources (human and funds) to ensure efficient Monitoring, Control and Surveillance for sustainability.

The State Department of Fisheries is concerned about the sustainability of Lake Victoria fisheries. Scientists have advised that the fish stocks are continuously declining and unless this is effectively dealt with, the sustainability of the fishery remains under threat. This will eventually have a negative impact on other businesses and the fishers.

All stakeholders especially fish processors and gear distributors should collaborate with the State Department of Fisheries in order to manage Lake Victoria fisheries resources sustainably. Many illegal gears are still in use and this can only be controlled with the cooperation of all the stake holders.

Table 4: Lake Victoria fish landings by Species, Weight and Value 2012 – 2014

Species	2012			2013			2014		
	M. tons	000 Kshs	% Comp	M. tons	000 Kshs	% Comp	M. tons	000 Kshs	% Comp
L. niloticus	52,472	7,472,681	44	43,736	8,521,449	35	42,838	8,405,209	33
R. Argentae	52,948	2,813,882	44	66,717	3,552,513	54	69,561	4,129,707	54
T. niloticus	6,081	899,643	5	7,445	1,209,614	6	7,927	1,331,670	6
Clarias	2,403	244,836	2	2,329	237,567	2	2,440	273,328	2
Proopterus	1,003	77,216	1	1,070	92,705	1	1,122	104,502	1
Haplochromis	715	62,774	1	1,112	84,513	1	919	72,601	1
Others	3,370	204,345	3	2,233	160,321	2	3,901	284,773	3
TOTAL	118,993	11,775,377	100	124,643	13,858,682	100	128,708	14,601,790	100

Table 5: Lake Victoria Monthly fish landings by Species, Weight (M. tonnes) and Value ('000 Kshs) 2014

Species		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
<i>L. niloticus</i>	Weight	3,236	2,775	2,585	3,477	3,787	3,326	2,950	3,671	3,363	4,778	4,405	4,484	42,838
	Value	639,206	544,375	507,161	681,555	742,543	652,239	578,579	719,057	660,238	937,313	863,111	879,832	8,405,209
<i>R. argentea</i>	Weight	5,491	5,361	5,919	7,220	5,353	6,977	4,194	4,730	5,739	6,913	4,852	6,811	69,560
	Value	326,372	313,906	347,373	428,391	324,482	420,865	248,734	278,135	340,750	410,633	285,582	404,483	4,129,707
<i>T. niloticus</i>	Weight	622	750	720	720	585	781	733	567	632	587	499	732	7,928
	Value	102,531	123,447	118,284	118,305	105,034	142,217	119,845	97,156	103,827	96,344	84,188	120,493	1,331,670
<i>Clarias</i>	Weight	201	207	192	181	234	158	239	209	215	180	191	234	2,440
	Value	22,522	23,204	21,498	20,247	26,161	17,744	26,730	23,432	24,114	20,133	21,384	26,161	273,328
<i>Protopterus</i>	Weight	91	82	115	141	95	75	100	87	110	63	72	93	1,122
	Value	8,440	7,606	10,731	13,128	8,856	6,981	9,273	8,127	10,210	5,834	6,668	8,648	104,502
Haplochromis	Weight	81	95	73	55	44	67	96	100	87	95	66	60	919
	Value	6,397	7,514	5,687	4,366	3,452	5,280	7,616	7,920	6,905	7,514	5,179	4,772	72,601
Others	Weight	310	423	385	410	362	313	235	263	341	334	229	296	3,900
	Value	23,727	29,804	27,116	29,462	24,556	23,379	17,956	20,105	25,708	23,887	17,321	21,752	284,773
TOTAL	Weight	10,032	9,694	9,989	12,203	10,459	11,698	8,546	9,627	10,487	12,950	10,313	12,710	128,708
TOTAL	Value	1,129,194	1,049,856	1,037,850	1,295,453	1,235,086	1,268,704	1,008,733	1,153,932	1,171,751	1,501,657	1,283,433	1,466,141	14,601,790

Table 6: Lake Victoria Annual fish landings by Species, Weight, Value and by Counties 2014

County	Busia		Siaya		Kisumu		H/Bay		Migori		Total	
Species	Metric tonnes	000 Kshs	Metric tonnes	000 Kshs	Metric tonnes	000 Kshs	Metric tonnes	000 Kshs	Metric tonnes	000 Kshs	Metric tonnes	000 Kshs
<i>L. niloticus</i>	777	172,578	8,222	1,699,242	786	160,081	30,422	5,865,824	2,631	507,483	42,838	8,405,209
<i>R. argentea</i>	2,944	166,159	15,093	1,011,616	1,786	159,650	45,139	2,535,385	4,599	256,896	69,561	4,129,707
<i>O. niloticus</i>	1,630	289,642	3,740	594,485	1,172	208,784	961	171,268	425	67,491	7,927	1,331,671
<i>Clarias</i>	-	-	75	4,133	875	63,709	1,448	202,801	41	2,684	2,439	273,328
<i>Protopterus</i>	-	-	1	33	326	6,789	651	87,105	146	10,575	1,122	104,502
<i>Haplochromis</i>	-	-	57	2,559	125	6,183	682	61,360	56	2,499	919	72,601
<i>Others</i>	118	13,819	1,198	57,675	487	37,398	2,097	175,693	3	188	3,901	284,773
Total	5,468	642,198	28,385	3,369,743	5,556	642,595	81,399	9,099,437	7,899	847,817	128,708	14,601,790

3.2 MARINE CAPTURE FISHERY

The marine capture fishery is composed of coastal and near shore artisanal, semi-industrial and offshore industrial fisheries. Artisanal and semi-industrial fisheries are exploited by the coastal local communities while the industrial fisheries are exploited by foreign fishing companies. During the year under review, the artisanal fishing fleet comprised of 2,913 fishing crafts and 12,915 fishermen (*Marine Artisanal Fisheries Frame Survey 2014 report*) while the semi-industrial fleet had only one licensed trawlers. The inshore waters which are fishing grounds for artisanal fishermen are over-exploited and degraded. Great potential exists in the exploitation of the Kenyan EEZ where estimates done in 1975-1980 indicate potential of 100,000 to 150,000 metric tonnes annually (FAO, 1980) and more recent estimates indicate potential of 300,000 metric tonnes (Habib 2003). This fishery is currently exploited by Distant Water Fishing Nations (DWFN) upon payment of access fees to the State Department of Fisheries. The State Department has limited capacity for Monitoring, Control and Surveillance (MCS) to ensure compliance with the established fisheries management standards, besides it is possible that vessels could be accessing our EEZ resources without payment of access fees. However the challenge at hand is large and needs a comprehensive approach in order to establish and deploy a national fisheries enforcement unit. A well trained and a disciplined law enforcement unit is critical toward the management of every fishery particularly when its operation is based on best scientific information.

The artisanal fishing activities are affected by Kenya's coastal oceanographic conditions which are caused by changes in the monsoon wind system (UNEP, 1998) that results to seasonal reversal process with NE monsoons between November-March and SE monsoons between May-September. These oceanographic processes cause distinct seasonality in the artisanal fishery, with high catches during the NE monsoon than the SE monsoon. These two seasons are referred to as *Kazi kazi* and *Kusi* by the locals. During *Kazi kazi* the sea is calm and there is a lot of fishing activities and fish landings are normally high while during *Kusi* the winds render the sea rough thus unfavorable to fishing trips.

During the year under review, a total of 9,073 metric tonnes of assorted fish species with an ex-vessel value of Kshs. 1,440,667,000 were landed by the artisanal fishers. This production reflected a small decline of 1% from last year's production of 9,134 metric tonnes with an ex-vessel value of Kshs. 1,298,172,000 (Tables 7, 8 and 9). The landings were done by 12,915 fishers using 2,913 fishing crafts with different types and sizes of fishing gears. The landings were done at

some 197 landing sites distributed all along the whole stretch of the Kenyan Coastline.

Landings from artisanal fishery have been increasing, declining then increasing in cycles while the value of the fish has maintained an upward trend over the years. Fish production from the marine artisanal fishery for the last ten years (2005-2014) has remained fairly constant between 7,000 and 9,000 metric tonnes only showing marginal fluctuations as shown in figure 6 below.

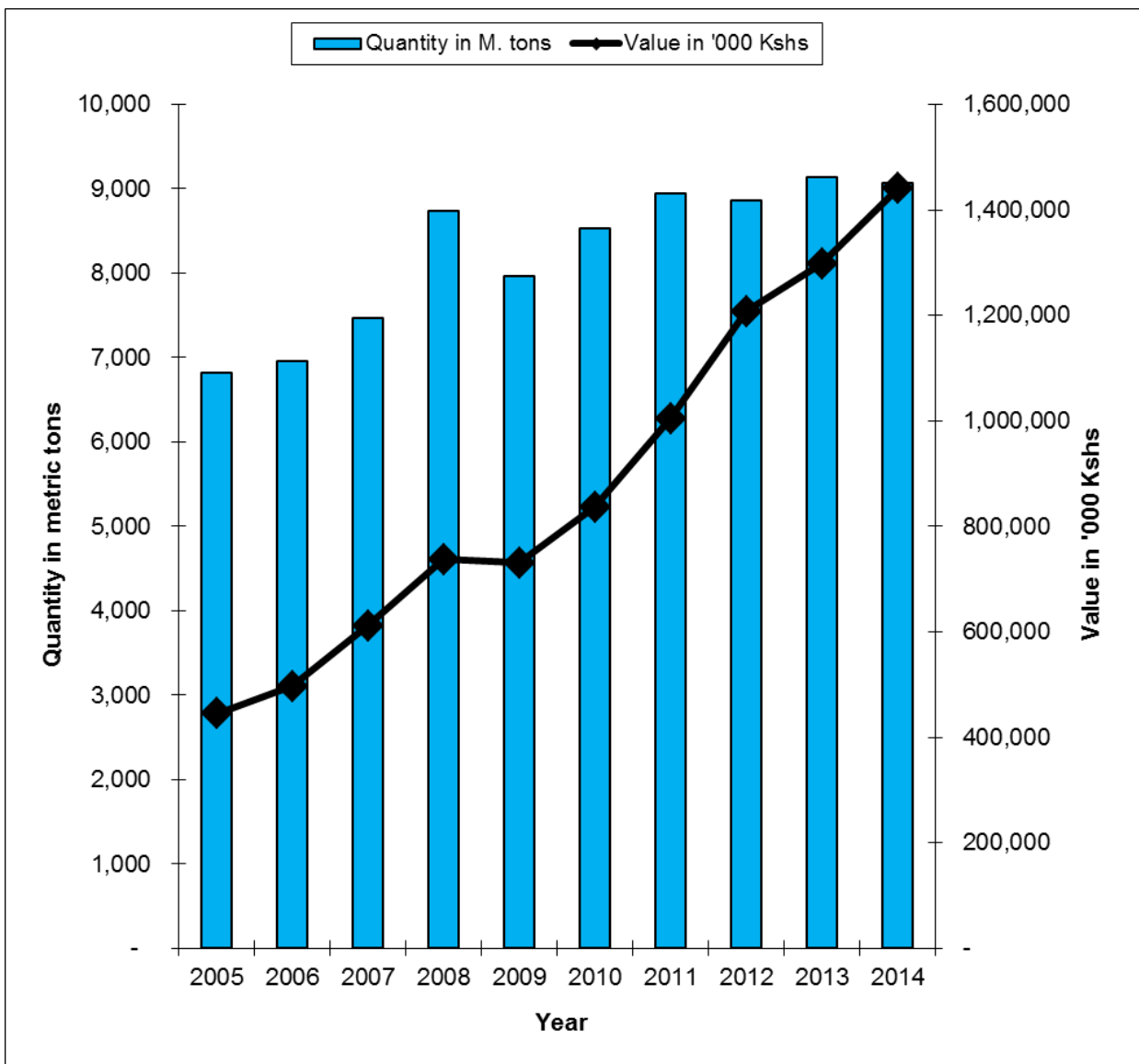


Figure 6: Trends of marine fish production by quantity and value 2005-2014

In 2014, demersal fish species category dominated the marine artisanal fish landings by contributing 4,519 metric tonnes (49.8%) of the total marine landings while pelagic fish category contributed 2,506 metric tonnes (27.6%), the sharks, rays and sardines category made up 847 metric tonnes (9.3%) of the landings,

crustaceans 555 metric tonnes (6.1%) and molluscs 646 (7.1%) figure 7. This trend has been the same over a number of years, figures 8.

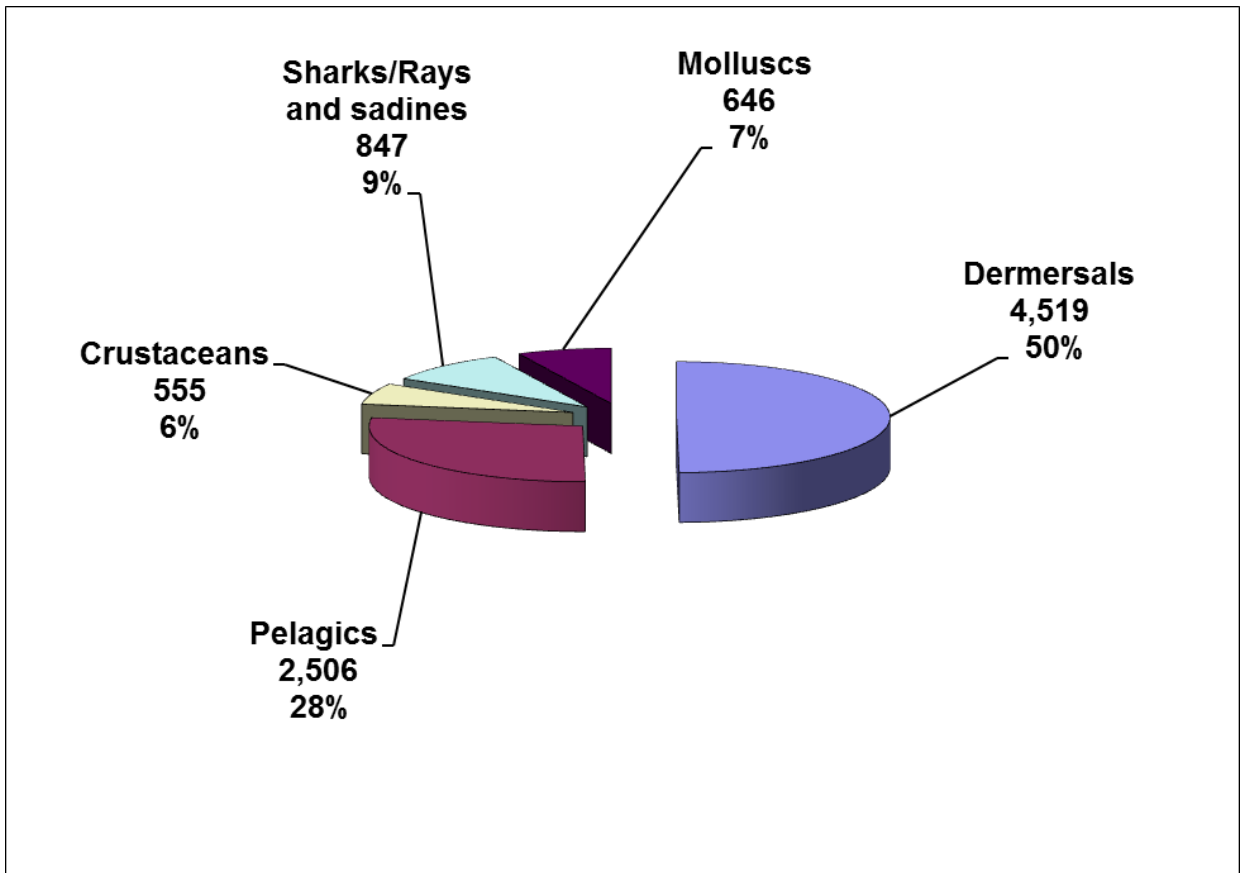


Figure 7: Percentage contribution of marine fish species groups 2014

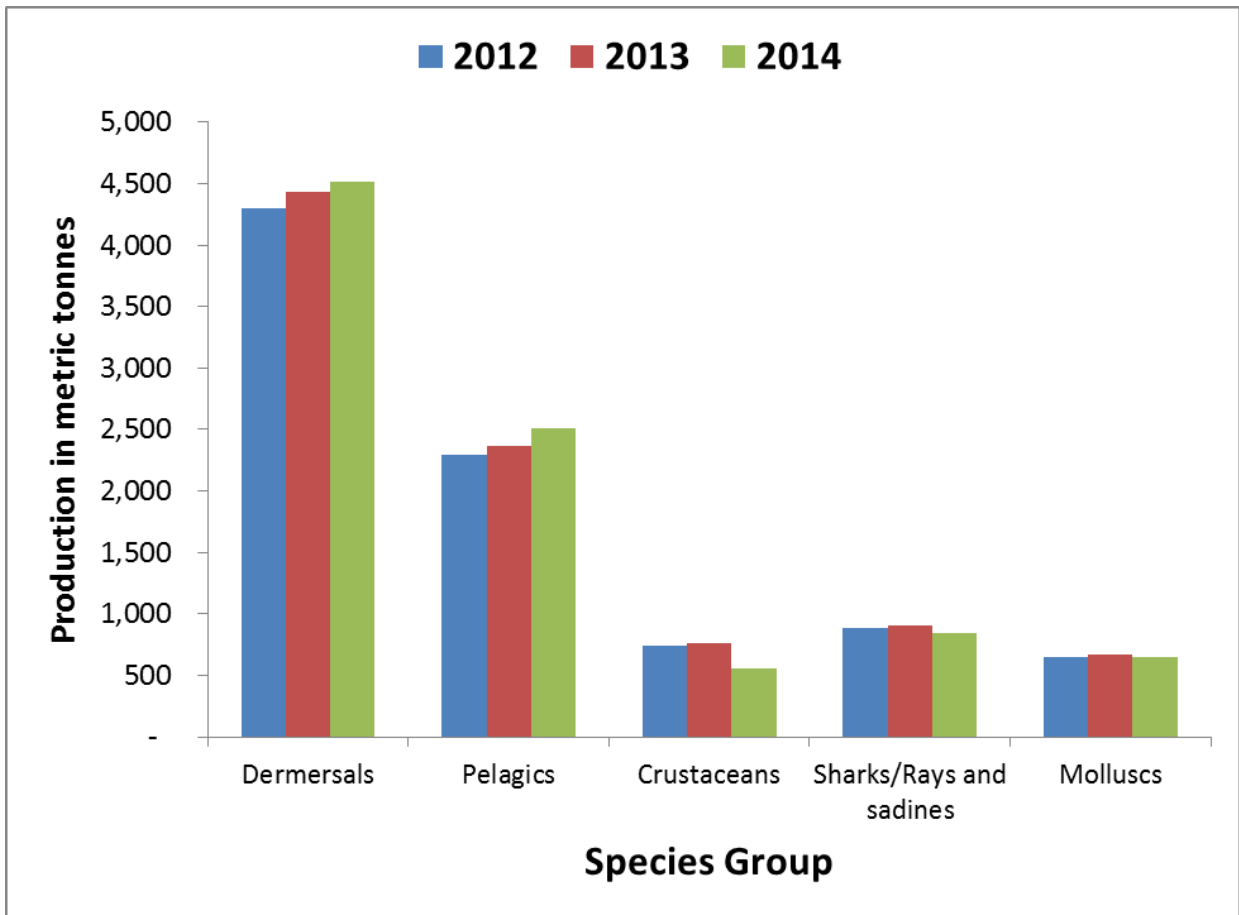


Figure 8: Trends of landings of marine fish species groups 2012-2014

During the year under review, Kwale County contributed the highest quantity of marine artisanal landings of 2,643 metric tonnes (or 29.1% of the total landings) with an ex-vessel value of Kshs 390,782,000 (or 27.1% of the total ex-vessel value). Kwale was followed by Lamu 2,456 metric tonnes (27.1%) with an ex-vessel value of Kshs 314,059,000 (or 21.8%), Kilifi 2,356 metric tonnes (26.0%) with an ex-vessel value of Kshs 398,313,000 (27.6%), Mombasa 1,219 metric tonnes (13.4%) with an ex-vessel value of Kshs 268,969,000 (18.7%), and lastly was Tana river county with a contribution of 399 metric tonnes or 4.4% with an ex-vessel value of Kshs 68,543,000 or 4.8% of the total ex-vessel value of all the marine artisanal landings as shown in figure 9 below.

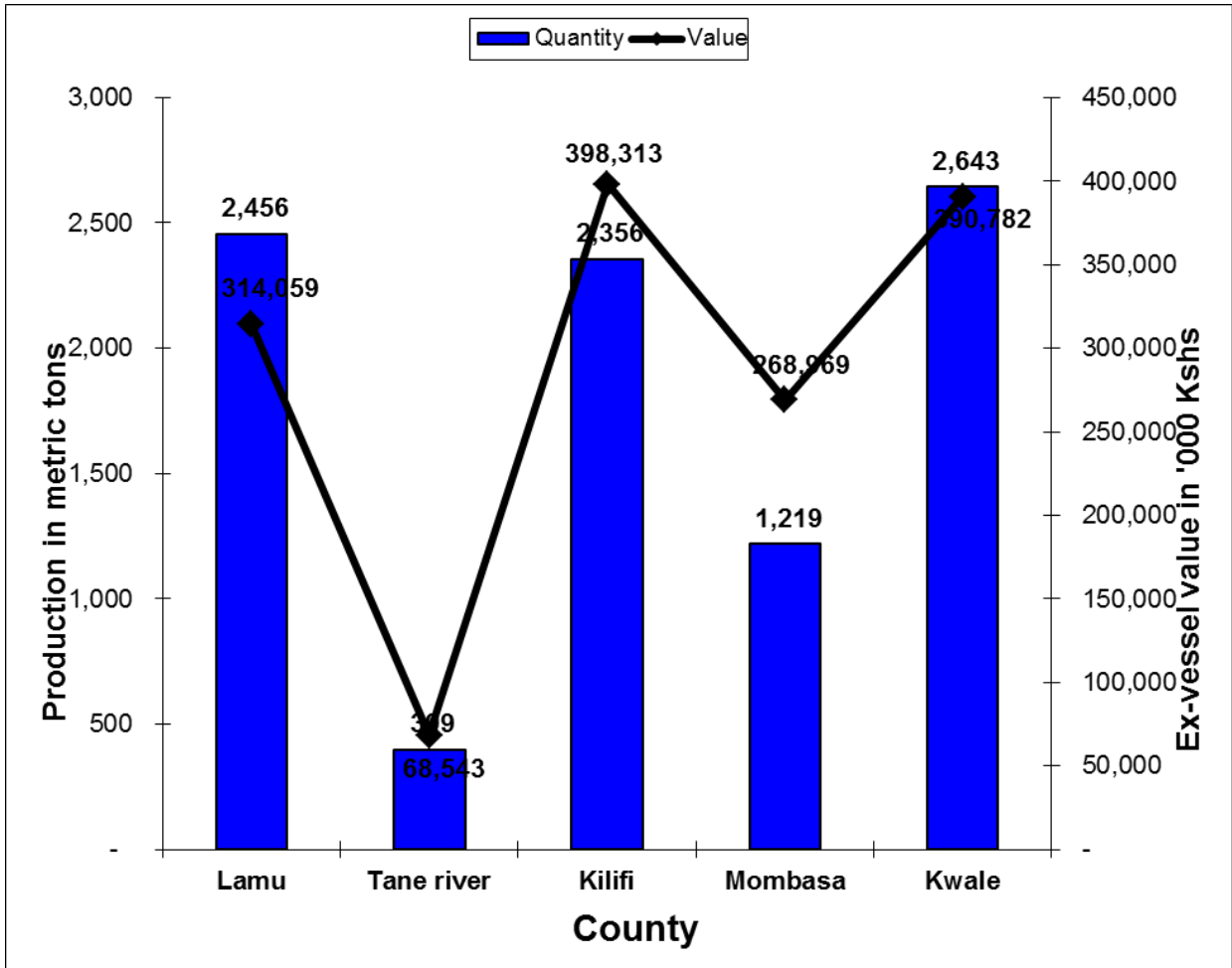


Figure 9: Marine fish production by Quantity, Value and Counties 2014

The most common fishing gears used by the artisanal fishers were gillnets, traditional traps (usio, malema), seine nets (which include beach, prawn and reef seines), long line hooks, hand lines, cast nets and trammel nets among others.

Table 7: Marine Fish Landings by Species, Weight and Value 2012 to 2014 (comparative)

SPECIES	2012		2013		2014	
	M. tons	000 Kshs	M. tons	000 Kshs	M. tons	000 Kshs
DEMERSAL						
Rabbit fish	645	81,776	794	105,666	722	98,217
Scavenger	602	71,633	685	81,641	686	107,033
Snapper	432	54,197	347	49,224	319	47,799
Parrot fish	416	44,969	540	53,973	508	63,986
Surgeon fish	104	11,295	94	10,668	130	16,193
Unicorn fish	133	13,680	154	18,812	175	24,187
Grunter	161	19,855	161	19,103	160	20,750
Pouter	168	17,277	165	18,442	194	25,977
Black skin	225	20,890	175	18,114	194	21,681
Goat fishr	125	14,940	115	14,674	117	15,464
Steaker	45	4,186	49	4,128	32	4,085
Rock cod	248	30,391	199	24,151	160	20,628
Cat fish	215	21,833	174	19,776	184	21,712
Mixed demersal	781	79,531	781	84,780	939	115,523

TOTAL	4,300	486,451	4,433	523,153	4,519	603,235
PELAGICS						-
Cavalla jacks	241	29,096	274	33,108	243	31,356
Mulletts	292	31,381	220	27,962	312	42,136
Little mackerels	329	37,998	328	39,457	448	58,276
Barracudas	260	31,386	317	41,523	301	42,416
Milk fish	79	9,521	61	6,839	83	10,562
King fish	121	17,942	168	25,544	127	21,979
Queen fish	179	20,889	192	25,393	151	21,278
Sail fish	142	21,193	140	21,743	176	30,326
Bonitos/Tunas	201	30,807	292	41,563	193	29,085
Dolphins	61	5,756	17	2,219	44	6,199
Mixed Pelagics	391	52,183	353	44,543	428	54,112
TOTAL	2,297	288,152	2,362	309,893	2,506	347,725
Sharks & Rays	373	46,064	314	46,339	293	48,084
Sardines	194	17,449	217	22,344	239	32,056
mixed fish/Others	313	39,468	377	42,069	314	41,178
TOTAL	881	102,981	908	110,752	847	121,318
CRUSTACEANS						-
Lobsters	96	94,255	123	114,952	107	108,857
Prawns	408	83,747	365	77,752	269	87,484
Crabs	235	55,251	274	58,146	180	46,691
TOTAL	739	233,253	762	250,851	555	243,032
MISCELLANEOUS						-
Oysters	74	6,942	32	2,179	35	1,395
Beche-de-mers	36	18,676	48	35,296	24	18,575
Octopus	394	49,402	446	45,899	437	70,714
Squids	144	21,241	143	20,149	151	34,673
TOTAL	649	96,260	669	103,523	646	125,356
TOTAL MARINE	8,865	1,207,098	9,134	1,298,172	9,073	1,440,667

Table 7: Marine monthly fish landing by Species, Weight and Value 2014

SPECIES	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		Total	
DEMERSAL	M. Ton	000 Kshs	M. Ton	000 Kshs	M. Ton	000 Kshs	M. Ton	000 Kshs	M. Ton	000 Kshs	M. Ton	000 Kshs	M. Ton	000 Kshs	M. Ton	000 Kshs	M. Ton	000 Kshs	M. Ton	000 Kshs	M. Ton	000 Kshs	M. Ton	000 Kshs	M. Tons	000 Kshs
Rabbit fish	49	7,072	43	6,339	48	6,329	60	7,377	88	9,900	64	7,764	62	7,489	62	8,518	54	8,634	66	9,291	57	9,116	69	10,389	722	98,217
Scavenger	59	9,941	41	6,678	57	9,023	59	8,590	62	7,054	46	7,156	52	7,607	72	11,610	54	9,636	59	9,474	59	10,052	65	10,213	686	107,033
Snapper	25	3,623	25	3,496	24	3,413	22	2,877	22	3,068	29	3,389	22	3,044	19	3,007	20	2,797	29	4,246	26	5,039	57	9,801	319	47,801
Parrot fish	43	5,821	38	4,968	43	5,553	67	6,711	62	6,917	32	3,962	41	4,356	31	4,401	28	3,947	45	5,254	35	5,291	43	6,802	507	63,984
Surgeon fish	12	1,419	13	1,696	21	2,322	7	820	6	891	4	536	5	746	6	751	7	1,033	10	1,312	19	2,328	20	2,338	130	16,191
Unicorn fish	12	1,484	18	1,809	19	2,087	6	923	14	1,790	7	934	5	633	6	900	7	1,304	9	1,437	20	3,902	51	6,985	175	24,187
Grunter	11	1,573	12	1,247	12	1,564	16	2,022	18	2,171	14	1,818	13	1,658	14	1,868	13	1,741	12	1,586	12	1,841	13	1,662	160	20,752
Pouter	14	1,754	16	2,061	14	1,753	15	1,898	17	1,987	16	1,916	17	2,326	17	2,419	18	2,793	18	2,365	17	2,604	16	2,099	194	25,975
Black skin	17	2,009	18	2,153	19	1,818	14	1,495	16	1,778	12	1,299	17	1,622	17	1,906	13	1,450	20	2,165	14	1,842	17	2,143	194	21,679
Goat fish	10	1,119	8	1,133	10	1,298	11	1,301	9	1,171	10	1,249	9	1,224	10	1,318	8	1,155	10	1,293	11	1,535	11	1,668	117	15,464
Steaker	2	290	3	326	3	452	2	211	3	338	3	394	3	341	3	317	2	214	2	268	3	608	3	325	32	4,085
Rock cod	14	1,713	17	2,162	11	1,513	12	1,549	8	1,060	7	1,001	10	1,187	11	1,435	11	1,379	12	1,691	15	2,208	30	3,733	160	20,630
Cat fish	17	2,888	16	1,816	15	1,771	14	1,543	12	1,168	10	1,083	13	1,388	13	1,517	14	2,094	14	1,571	21	2,355	26	2,517	184	21,712
Mixed dermasal	81	9,710	83	9,183	69	7,845	88	10,602	83	10,250	56	7,861	85	10,015	88	12,128	89	10,658	85	10,031	65	9,061	67	8,180	939	115,523
TOTAL	367	50,417	352	45,068	367	46,741	392	47,919	419	49,542	309	40,361	354	43,635	369	52,095	337	48,834	390	51,985	375	57,780	488	68,856	4,519	603,234
PELAGICS																										
Cavalla jacks	20	2,628	14	2,786	18	2,064	15	1,825	20	2,516	18	2,157	19	2,297	19	2,320	20	2,335	24	2,879	29	4,314	27	3,233	243	31,354
Mulletts	24	3,416	17	2,421	21	2,428	21	2,549	24	3,152	20	2,602	30	3,889	30	4,175	28	3,967	42	5,510	28	4,329	26	3,696	311	42,136
Little mackerels	26	3,199	25	3,172	31	4,901	28	3,635	22	3,207	13	1,900	34	4,066	39	5,101	45	5,231	54	7,104	70	9,086	60	7,674	448	58,277
Barracudas	26	3,548	26	3,565	27	4,134	27	3,361	25	3,223	22	2,742	19	3,415	22	3,084	23	3,126	30	4,309	25	3,816	29	4,094	301	42,416
Milk fish	5	533	8	971	11	1,382	5	603	7	750	5	573	7	819	6	746	5	700	6	814	4	622	15	2,049	83	10,562
King fish	10	1,814	11	1,418	9	1,493	8	1,378	8	1,221	3	931	9	1,086	11	2,150	16	3,101	15	2,585	12	2,159	15	2,641	127	21,979
Queen fish	9	1,092	9	1,168	10	1,099	8	949	8	972	7	781	10	1,152	11	1,320	10	1,291	22	4,266	24	3,495	24	3,693	151	21,278
Sail fish	31	5,435	40	6,804	24	4,355	6	1,171	6	1,363	5	1,006	8	1,318	9	1,396	10	1,511	11	1,741	10	1,547	17	2,679	176	30,326
Tuna	27	3,474	30	4,310	20	2,520	10	1,372	10	1,533	8	1,409	10	1,489	12	1,830	14	3,324	16	2,542	17	2,589	20	2,695	193	29,087
Dolphin fish	6	670	11	1,228	1	220	1	262	1	139	0	107	1	100	1	207	3	424	3	471	3	584	12	1,787	44	6,199
Mixed Pelagics	55	7,472	59	6,030	50	6,413	37	4,582	23	4,451	22	2,538	18	2,357	23	2,562	27	3,377	31	4,229	36	4,650	48	5,450	428	54,112
TOTAL	238	33,283	250	33,874	222	31,009	168	21,688	155	22,527	123	16,744	165	21,988	181	24,891	202	28,387	255	36,450	256	37,191	293	39,692	2,506	347,725

Sharks & Rays	33	5,193	26	3,837	21	3,202	16	2,472	19	2,916	20	4,411	17	3,317	21	3,342	29	4,659	23	3,541	29	4,674	40	6,520	293	48,085
Sardines	20	2,551	19	2,008	22	2,118	25	2,251	19	2,360	17	2,769	13	1,994	14	1,921	20	2,599	21	4,554	18	2,979	31	3,950	240	32,056
mixed fish/Others	38	5,313	32	4,270	26	3,277	35	3,408	27	2,911	15	2,090	18	2,141	19	2,544	19	2,446	19	2,161	28	4,995	38	5,623	314	41,178
TOTAL	90	13,057	77	10,115	69	8,597	76	8,131	66	8,187	51	9,269	48	7,453	54	7,807	68	9,704	63	10,255	76	12,648	109	16,094	847	121,318
CRUSTACEANS																										
Lobsters	9	7,972	9	9,898	10	10,015	8	7,325	8	7,281	3	2,723	6	6,040	6	5,905	10	10,530	6	6,064	16	17,835	15	17,268	107	108,857
Prawns	16	5,261	17	5,390	18	5,801	19	5,469	34	9,865	56	12,573	17	4,323	17	4,223	22	5,346	28	20,963	5	1,555	20	6,715	269	87,485
Crabs	11	2,452	12	2,826	15	3,855	17	4,741	16	5,396	12	3,037	16	4,713	16	4,318	22	6,350	10	1,657	20	4,943	13	2,403	180	46,690
TOTAL	36	15,685	38	18,114	43	19,672	43	17,535	58	22,542	71	18,333	38	15,075	40	14,446	53	22,227	44	28,683	42	24,333	49	26,386	555	243,032
MISCELLANEOUS																										
Oysters	2	106	8	110	4	21	8	145	1	108	2	164	2	148	2	133	3	147	2	149	1	97	0	67	35	1,395
Beche-de-mers	4	2,512	2	1,994	2	2,152	2	2,060	2	1,130	1	405	1	833	1	1,178	1	659	2	738	2	1,625	3	3,289	24	18,575
Octopus	22	3,603	34	5,431	34	5,293	39	6,079	34	5,688	27	3,735	30	4,988	39	6,595	48	8,116	46	7,445	38	6,473	45	7,267	437	70,713
Squids	15	3,689	26	5,627	12	3,348	13	2,847	15	3,166	10	2,222	5	1,363	10	2,662	7	1,800	7	1,397	12	2,703	17	3,849	151	34,672
TOTAL	44	9,909	70	13,162	53	10,813	62	11,131	52	10,092	40	6,525	38	7,333	52	10,568	60	10,722	56	9,730	54	10,898	66	14,471	646	125,356
TOTAL MARINE	774	122,351	787	120,333	752	116,833	742	106,404	749	112,891	594	91,233	643	95,485	697	109,808	720	119,874	808	137,103	803	142,851	1,005	165,498	9,073	1,440,667

Table 8: Marine fish landing by Species, Weight and Value and by Counties 2014

Species	Lamu		Tana River		Kilifi		Mombasa		Kwale		Total	
	M. Tons	000 Kshs	M. Tons	000 Kshs	M. Tons	000 Kshs	M. Tons	000 Kshs	M. Tons	000 Kshs	M. Tons	000 Kshs
DEMERSAL												
Rabbit fish	331	26,831	5	411	121	22,353	89	21,926	176	26,697	722	98,217
Scavenger	290	28,560	9	1,094	148	31,050	68	17,970	171	28,359	686	107,033
Snapper	96	10,670	22	2,501	57	9,139	41	11,016	103	14,473	319	47,800
Parrot fish	257	22,299	0	26	62	11,702	51	9,255	137	20,704	507	63,985
Surgeon fish	16	1,558	3	251	67	7,803	3	876	41	5,704	130	16,192
Unicorn fish	16	1,605	-	-	100	13,822	15	3,593	44	5,166	175	24,187
Grunter	50	3,760	1	107	20	3,000	58	10,045	30	3,838	160	20,751
Pouter	79	7,960	-	-	17	3,665	52	7,643	46	6,709	194	25,976
Black skin	94	8,281	-	-	19	2,792	3	917	78	9,690	194	21,680
Goat fish	48	3,648	-	-	7	1,056	28	6,069	33	4,691	117	15,464
Streaker	3	321	-	-	10	1,591	-	-	19	2,173	32	4,085
Rock cod	48	4,405	9	924	38	5,483	10	2,425	54	7,391	160	20,629
Cat fish	62	4,501	36	3,229	30	5,229	14	3,267	42	5,486	184	21,712
Mixed demersal	401	36,495	53	5,506	299	45,431	27	7,174	160	20,917	939	115,523
TOTAL	1,791	160,894	139	14,049	994	164,117	459	102,176	1,136	161,999	4,519	603,235
PELAGICS												
Crevallae jacks	64	5,112	21	1,683	39	6,744	39	8,406	79	9,411	243	31,355
Mulletts	134	13,206	18	1,845	65	11,924	29	5,422	65	9,739	311	42,136
Little mackerels	-	-	3	303	204	28,522	57	8,539	184	20,913	448	58,277
Barracudas	63	5,031	4	414	70	10,510	64	13,928	101	12,533	301	42,416
Milk fish	33	2,690	-	-	30	4,858	0	65	19	2,949	83	10,562
King fish	10	962	14	2,084	60	10,591	21	4,606	22	3,736	127	21,979
Queen fish	28	2,252	42	6,727	30	5,246	29	4,643	23	2,410	151	21,278
Sail fish	8	760	3	367	127	21,455	28	6,224	10	1,520	176	30,326
Tunny	19	1,714	2	62	72	12,231	13	2,793	88	12,286	193	29,086
Dolphin fish	-	-	23	2,570	14	2,541	-	-	6	1,088	44	6,199
Mixed Pelagics	18	1,650	-	-	217	32,300	5	1,045	188	19,117	428	54,112

TOTAL	378	33,376	130	16,055	927	146,922	285	55,670	786	95,702	2,506	347,725
Sharks & Rays	20	2,826	43	6,865	82	13,781	90	18,256	58	6,356	293	48,085
Sardines	-	-	-	-	45	7,945	77	14,647	116	9,464	239	32,056
mixed fish/Others	37	6,022	-	-	106	13,795	85	14,032	87	7,328	314	41,178
TOTAL-	57	8,849	43	6,865	233	35,521	252	46,935	261	23,148	847	121,318
CRUSTACEANS											-	-
Lobsters	39	50,853	8	9,646	11	11,802	14	6,997	35	29,558	107	108,857
Prawns	48	11,898	43	17,994	26	7,587	128	41,997	24	8,010	269	87,485
Crabs	87	30,027	10	1,187	12	1,925	23	4,230	48	9,321	180	46,690
TOTAL	174	92,777	61	28,828	49	21,314	164	53,224	106	46,889	555	243,032
MOLLUSCS												
Oysters	21	251	-	-	1	145	12	903	1	96	35	1,395
Beche-de-mers	4	10,795	-	-	1	128	-	-	20	7,653	24	18,575
Octopus	13	1,234	25	2,745	99	16,952	35	7,337	265	42,444	437	70,713
Squids	17	5,883	-	-	53	13,215	12	2,723	68	12,851	151	34,672
TOTAL	55	18,163	25	2,745	153	30,439	59	10,964	354	63,044	646	125,356
TOTAL MARINE	2,456	314,059	399	68,543	2,356	398,313	1,219	268,969	2,643	390,782	9,073	1,440,667

3.3 LAKE TURKANA FISHERY

Lake Turkana is Africa's fourth largest lake by volume and Kenya's largest inland lake measuring about 249 km long by 48 km at its widest part, with a delta extending into Ethiopia. It lies in a closed basin 365 meters above sea level. The lake has three volcanic islands namely the north, central and south islands. The central island has three saline crater lakes known for endemic species of tilapias. The islands are listed as UNESCO's world heritage sites.

Over 90% of the annual water discharge by volume is from river Omo originating from the Ethiopian highlands while the rest is from seasonal rivers Kerio and Turkwel. River Omo drains a large portion of the south western highlands of Ethiopia and therefore influences fluctuations in the lake's water level, which in turn affects the amount (or abundance) of fish stocks and hence fish production from the lake. With no surface outlet, the water budget is a balance between river inflow and evaporation which imposes special physical chemical conditions making the lake saline. Therefore any activities dealing with water abstraction or damming that interferes with the natural discharge rates of river Omo has a negative effect on the lake volume levels.

The lake has about 48 species of fish with a dozen supporting a commercial fishery. The species exploited commercially include, Nile perch (*Lates niloticus*), Tilapia (*Oreochromis niloticus*), Catfish (*Clarias gariepinus*), *synodontis schall*, *Hydrocynus forskalii*, *Labeo horie*, *Bagrus spp*, *Distichodus niloticus*, *Citharinus spp*, *Barbus spp* and *Alestes spp*. The fishery is characterized by bust cycles in fish landings associated with fluctuations in lake levels due to the dynamics of the climatic conditions especially precipitation leading to filling and drying up of the Ferguson's gulf. The filling up of the Ferguson's gulf is associated with boom in fish catches especially tilapias. The peripheral communities entirely rely on fishing directly supporting about 7,000 fishers and 6,500 fish traders and transporters.

During the year under review, a total of 4,166 metric tonnes of fish were landed with an ex-vessel value of Kshs 433,790,000 from both sides (Turkana and Marsabit counties) of the lake. This year's production was a decline of 4.0% in quantity coupled with a small decline of 1.1% in ex-vessel value compared to 2013 production of 4,338 metric tonnes and an ex-vessel value of Kshs 438,646,000. The trends in annual fish catches from Lake Turkana are determined by the lakes' water level and for that the catches have been unpredictable for a long time. But there has been a continuous decline in the catches since 2009 apart from the increase in 2013, figure 10.

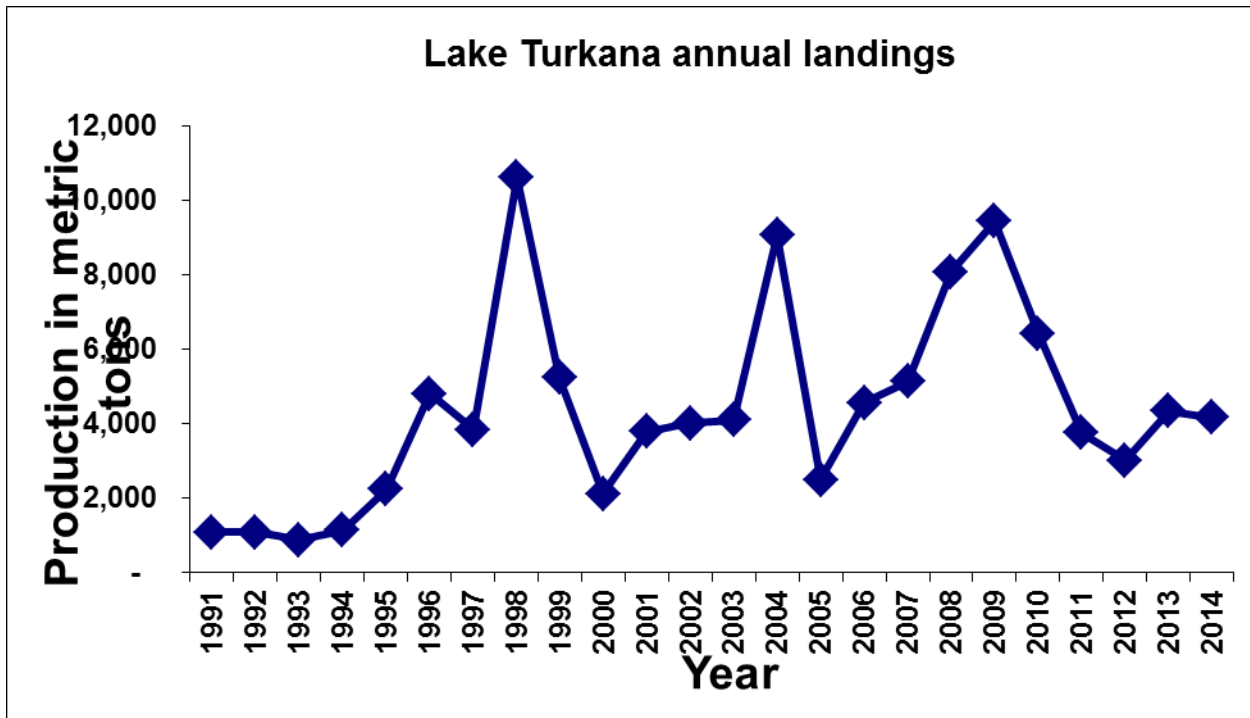


Figure 10: Trends in annual fish landings from Lake Turkana fishery 1991-2014

During the year under review, *Tilapia spp* dominated the landings by contributing 1,743 metric tonnes (or 41.8%) followed by *Labeo horie* 621 metric tonnes (14.9%), *Lates niloticus* 560 metric tonnes (13.5%), *Distichodus* 319 metric tonnes (7.7%) and *Alestes niloticus* 318 metric tonnes (7.6%). These five species combined contributed 85.5% and the other species combined contributed the remaining 14.5%, figure 11 and table 10. The Western side (Turkana county) produced the bulk of the lake’s production of 97.2% (4,050 metric tonnes) while the Eastern side (Marsabit county) contributed only 2.8% (116 metric tonnes), Table 11.

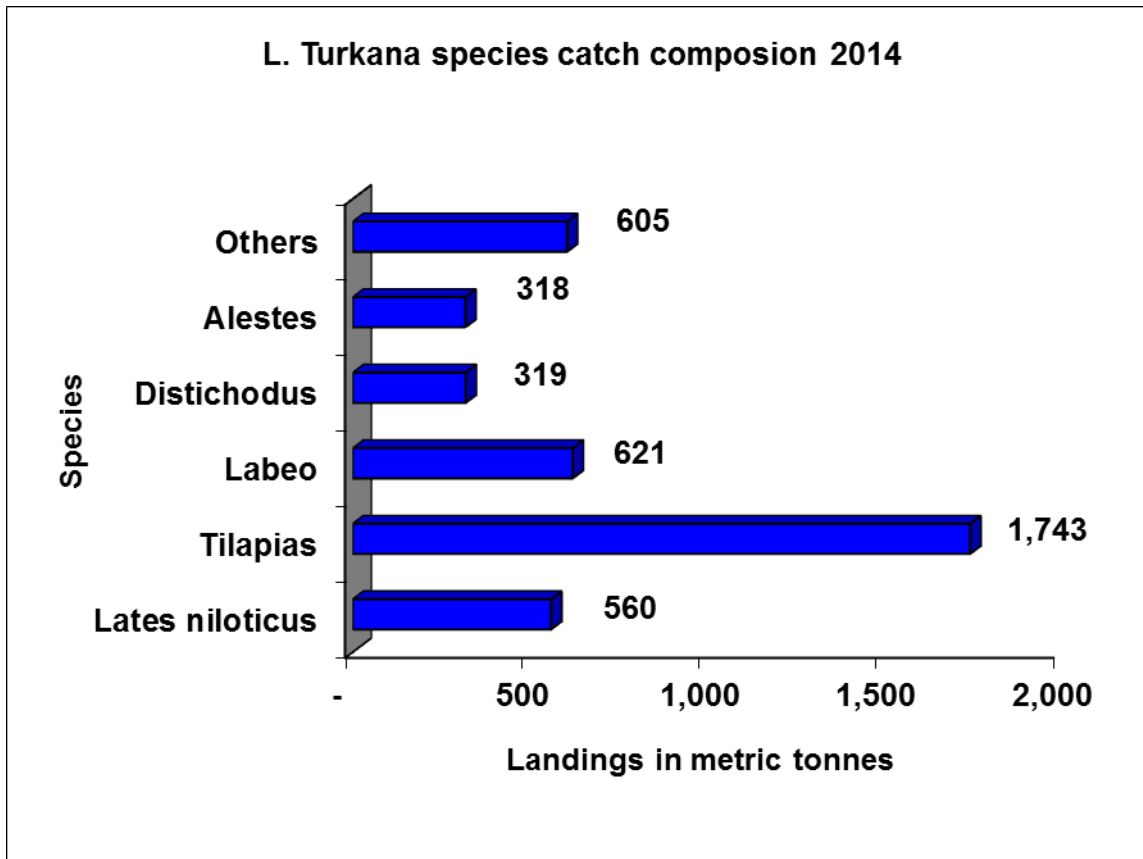


Figure 11: Species composition in catches of Lake Turkana Fishery 2014

One of the major challenges in the exploitation of the Lake Turkana fishery is lack of cold storage facilities within reach forcing all fishers to sale almost all their catches as dried or smoked products which are inferior products and consequently fetch highly reduced market prices per nominal unit weight.

There is also need to evaluate the data collection system in the region due to the expansiveness of the lake shoreline and build capacity of the local fishers groups and Beach Management Units (BMUs) through training to effectively undertake primary data collection.

Some of the main challenges still facing Lake Turkana fishery which need to be addressed include the following:

- ◆ Lack of appropriate fish handling and preservation facilities that usually lead to post-harvest losses and poor quality of fish and fishery products;
- ◆ Poor state of landing site access roads, which make marketing impossible at some landing sites such as Todonyang and Namukuse;
- ◆ Armed conflicts between the Turkana in Kenya and the Dasenach in Ethiopia over fishing and grazing grounds in the River Omo delta. Many lives have been lost especially on the Kenyan side;
- ◆ Weak and unfavorable fish marketing systems along the fish landing sites;

- ◆ Rampant insecurity in the lake which make resource Monitoring, Control and Surveillance a risky affair;
- ◆ Insufficient funds for training Beach Management Units in data collection

There is an urgent need to develop a sound management plan for Lake Turkana fishery. The State Department of Fisheries should strengthen community participation in Fisheries resource management, utilization and conservation in the entire lake through:

- Capacity building of BMU officials and fishers from both sides of the lake;
- Train fishers on appropriate hygiene and sanitation, fish handling, processing and fish value addition.

Table 9: Lake Turkana fish landings by Species, Weight and Value 2014

SPECIES	Western side		Eastern side		Total	
	M. tons	000 Kshs	M. tons	000 Kshs	M. tons	000 Kshs
Lates. niloticus	548	64,485	12	3,357	560	67,842
Tilapias	1,708	183,059	35	4,721	1,743	187,780
Labeo	552	52,977	69	7,873	621	60,851
Barbus	88	8,139			88	8,139
Citharinus	116	13,866			116	13,866
Distichodus	319	33,946			319	33,946
Clarias	59	4,774			59	4,774
Hydrocy forskalii	106	9,650			106	9,650
Synodontis	136	11,672			136	11,672
Alestes	318	26,871			318	26,871
Bagrus	101	8,398			101	8,398
TOTAL	4,050	417,839	116	15,951	4,166	433,790

Table 10: Lake Turkana Monthly fish landings by Weight and Value 2014

Month	Western side		Eastern side		Total	
	M. tons	000 Kshs	M. tons	000 Kshs	M. tons	000 Kshs
January	282	25,647	8	1,114	290	26,761
February	317	35,018	7	955	324	35,973
March	337	37,033	8	1,114	345	38,147
April	370	40,920	11	1,507	381	42,427
May	343	38,319	9	1,207	352	39,526
June	386	41,379	8	1,065	394	42,444
July	398	41,654	9	1,162	407	42,816
August	385	40,102	10	1,353	395	41,454
September	339	31,694	6	887	345	32,582
October	308	29,923	14	1,846	322	31,770
November	290	27,533	12	1,725	302	29,257
December	293	28,616	15	2,017	308	30,633
TOTAL	4,050	417,839	116	15,951	4,166	433,790

3.4 LAKE BARINGO FISHERY

Lake Baringo is one of the Rift valley lakes with a surface area of 130 Km² and a mean depth of 5.6 metres. The lake has rivers El Molo, Perkerra and Ol arabel as the main inlets but with no obvious outlet and the waters are assumed to seep through to the underground bedrock which is believed to be volcanic

The fishery of Lake Baringo is currently based on four species including *Oreochromis niloticus* (Tilapia), *Barbus gregorii*, *Clarias mossambicus* and *Protopterus aethiopicus* which was introduced in the lake.

The fishery was previously based on the tilapiine species, however owing to changes in the lake's biophysical processes such as siltation and species introductions, the fishery is currently dominated by *Protopterus aethiopicus*.

During the year under review a total of 301,572 Kgs of fish with an ex-vessel value of Kshs. 86,594,836 were landed. This was an increase of 14.8% in quantity and a huge increase of 246.3% in ex-vessel value compared to last year's production of 263,445 Kg valued at Kshs. 25,008,451.

The species catch composition was dominated by *Protopterus aethiopicus* having contributed 55.5% (168 metric tonnes) followed by *Tilapia spp* 31.5% (95 metric tonnes), *Clarias spp* 8.5% (26 metric tonnes) and *Barbus spp* with 4.4% (13 metric tonnes), figure 12 and table 12.

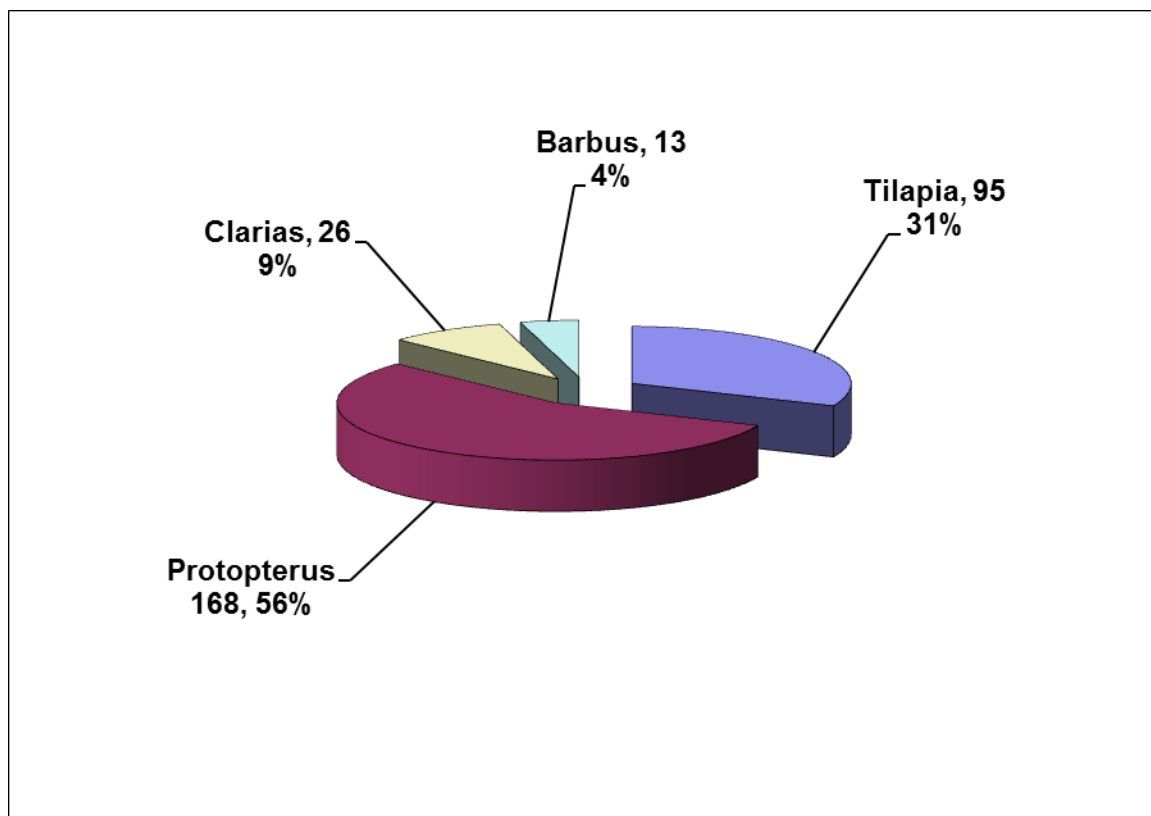


Figure 12: Percentages catch by species composition in Lake Baringo in 2014

Table 11: Lake Baringo Monthly fish landings by Species, Weight and Value 2014

MONTH	Tilapia		Protopterus		Clarias		Barbus		Total	
	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs
Jan	3,998	1,199,399	8,023	2,406,948	828	165,581	441	88,134	13,290	3,860,061
Feb	7,154	2,146,218	7,150	2,144,956	774	154,796	620	124,040	15,698	4,570,011
Mar	7,615	2,284,502	7,327	2,197,968	1,534	306,843	539	107,719	17,014	4,897,031
Apr	5,285	1,585,558	8,572	2,571,496	1,912	382,337	563	112,615	16,332	4,652,007
May	6,041	1,812,268	10,535	3,160,440	2,520	503,933	498	99,559	19,593	5,576,199
Jun	4,473	1,341,916	8,051	2,415,221	1,041	208,298	1,020	204,013	14,585	4,169,448
Jul	6,000	1,800,039	10,509	3,152,780	1,002	200,473	873	174,635	18,385	5,327,927
Aug	8,263	2,478,758	12,096	3,628,653	995	198,993	1,216	243,184	22,569	6,549,588
Sep	9,489	2,846,573	12,207	3,662,053	1,697	339,409	1,200	239,920	24,592	7,087,956
Oct	13,679	4,103,826	14,396	4,318,717	3,187	637,370	2,326	465,150	33,588	9,525,063
Nov	14,454	4,336,180	18,239	5,471,784	5,928	1,185,711	2,473	494,528	41,094	11,488,203
Dec	8,741	2,622,215	50,509	15,152,585	4,163	832,557	1,420	283,987	64,832	18,891,344
TOTAL	95,192	28,557,452	167,612	50,283,601	25,580	5,116,301	13,188	2,637,484	301,572	86,594,838
	Tilapia		Protopterus		Clarias		Barbus		Total	
	M. tonnes	000 Kshs	M. tonnes	000 Kshs	M. tonnes	000 Kshs	M. tonnes	000 Kshs	M. tonnes	000 Kshs
	95	28,557	168	50,284	26	5,116	13	2,637	302	86,595

3.5 LAKE NAIVASHA FISHERY

The present fish population of Lake Naivasha comprises of the introduced species including largemouth bass (*Micropterus salmoides*) which was introduced in 1927, 1951 and 1956 from the United States of America, *Tilapia zilli* introduced from Lake Victoria in 1956. The introduction of *Tilapia zilli* also contained *Oreochromis leucostictus* and other tilapine species which are presently not encountered in the lake. The exotic rainbow trout (*Onchorhynchus mykiss*) occasionally strays into the lake from river Malewa while *Barbus amphigramma* migrates between the lake and river Malewa. The Louisiana red swamp crayfish (*Procambarus clarkii*) was introduced in 1970 as a source of food for the bass. The *Procambarus clarkii* and *Barbus amphigramma* are not under commercial exploitation currently in the lake.

The recent accidental introduction of Common carp (*Cyprinus carpio*) has created a shift in the fish production from the lake. The *Cyprinus carpio* is believed to have come through river Malewa from Nyandarua highlands during the El-Nino period of 1998-1999.

Species composition in the catches from the lake has drastically changed since the year 2002 where total catches were dominated by the *tilapiines*. However over the last thirteen years, *Tilapiines* contribution in catches has declined with the introduced *Cyprinus carpio* assuming greater prominence in the catches.

It is imperative for management and research to understand the implications of the *Cyprinus carpio* on the other fish species in the ecosystem. Besides, it is also important to understand the effects of the feeding habits of the *Cyprinus carpio* on the breeding grounds/nests of the *tilapiines* in the fishery.

During the year under review, a total of 632,790 Kgs of fish with an ex-vessel value of Kshs. 68,070,617 were landed from Lake Naivasha. This was huge increase of 174% in quantity coupled 288% in value compared to 2013 landings of 230,963 Kgs valued at Kshs 17,542,071 to the fishers. Common carp (*Cyprinus carpio*) continued to be the most dominant species accounting for 48.3% (305,466 Kgs) of the total catch. The other species contribution were *Oreochromis niloticus* 44.0% (278,518 Kgs), lake 'Naivasha tilapia' (*Oreochromis leucostictus*) 3.7% (23,284 Kgs), *Mirror carp* accounting for 3.1% (19,363 Kg), Black bass (*Micropyerus salmoides*) 0.5% (2,982 Kgs) and *Clarias gariepinus* 0.5% (3,179 Kgs), figure 13.

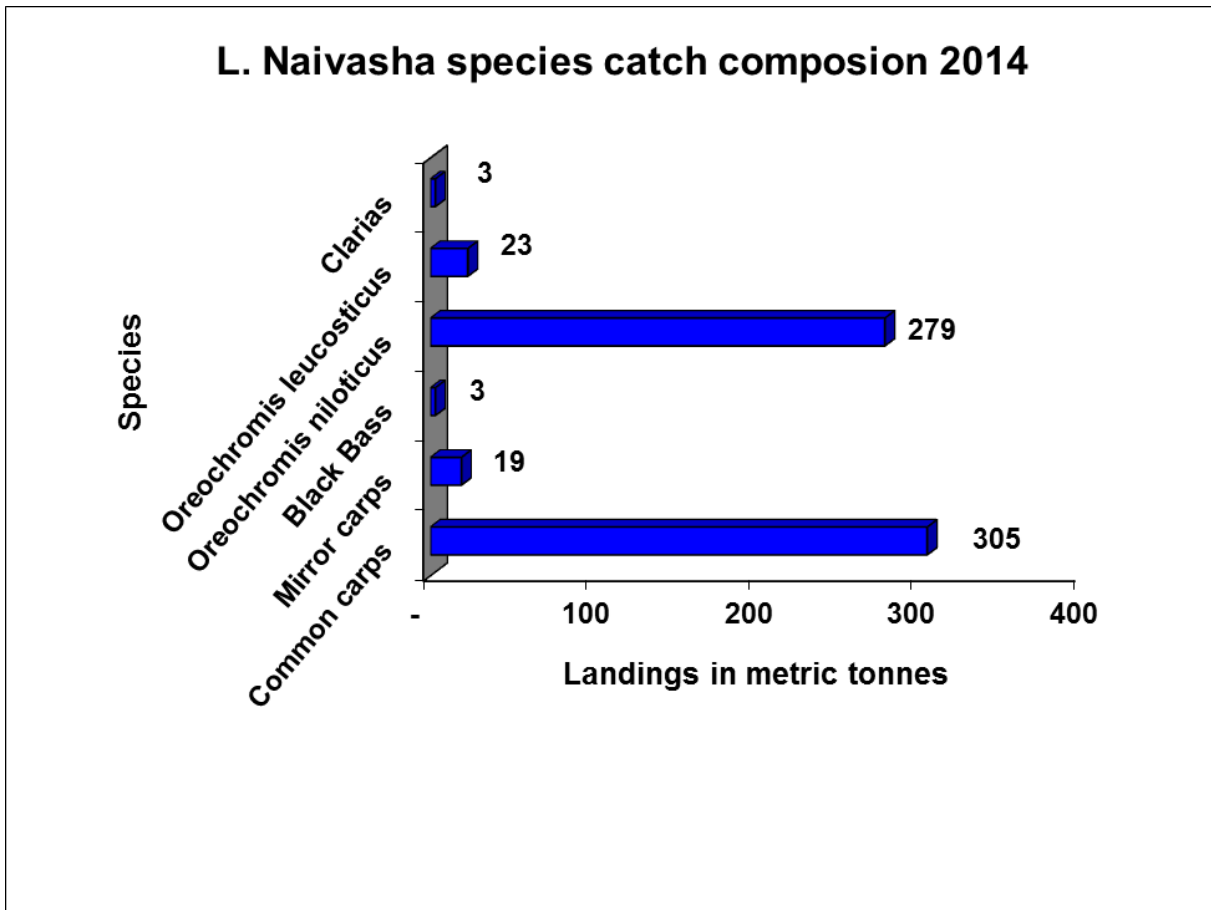


Figure 13: Lake Naivasha species composition landings in metric tonnes 2014

During the year under review, average monthly fish catches was 52.7 metric tonnes with a peak between April and August figure 14 and Table 13. A total of 50 fishing crafts were licensed to operate and these were operated by an average of 150 fishers per month.

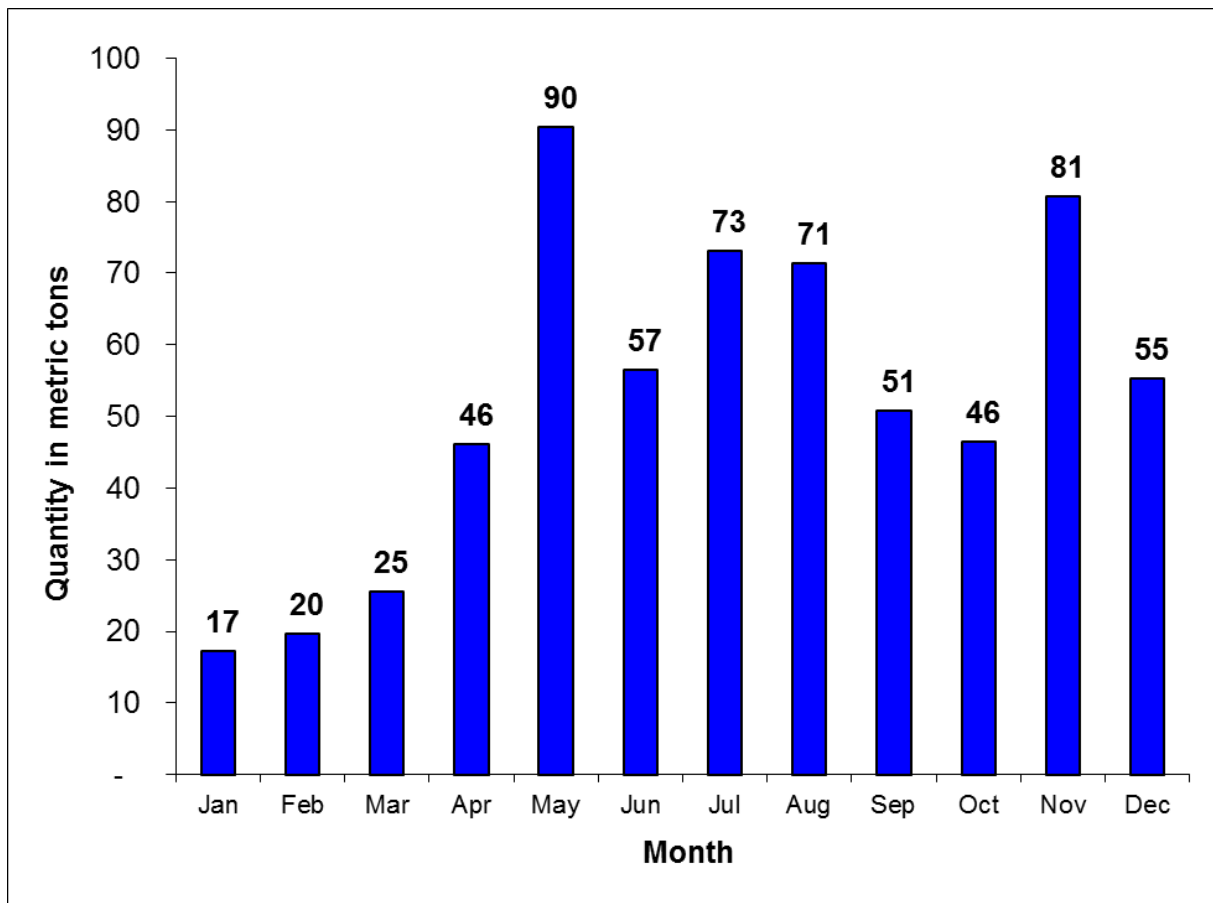


Figure 14: Lake Naivasha monthly catches in metric tonnes 2014

Table 12: Lake Naivasha Monthly fish landings by Species, Weight and Value 2014

	O.niloticus		O.leucosticus		M.salmoides		C.gariepinus		M. carp		C. carp		Total	
Month	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs
Jan	1,240	132,680	532	139,630	39	6,981	-	-	714	73,510	14,662	1,476,118	17,187	1,828,919
Feb	3,028	422,712	265	86,840	31	5,301	-	-	473	58,120	15,782	1,434,780	19,578	2,007,753
Mar	9,801	1,050,630	230	57,760	204	35,545	-	-	679	79,380	14,576	1,370,958	25,489	2,594,273
Apr	28,763	3,179,518	974	177,546	331	35,320	-	-	144	16,848	15,886	1,523,505	46,098	4,932,737
May	69,747	8,630,324	878	165,717	127	14,105	398	13,040	234	27,846	19,017	1,743,143	90,401	10,594,175
Jun	43,740	4,606,554	1,427	174,078	249	38,097	832	25,800	960	113,280	9,301	820,537	56,509	5,778,346
Jul	47,542	4,994,878	1,660	314,707	230	40,750	450	22,142	192	28,800	22,994	2,790,729	73,068	8,192,006
Aug	49,673	5,215,704	1,547	278,710	277	48,475	571	38,915	185	20,635	19,063	2,478,692	71,316	8,081,131
Sep	17,990	2,230,760	2,461	515,765	182	27,785	464	23,921	1,044	122,148	28,671	2,803,496	50,812	5,723,875
Oct	3,398	497,400	2,181	446,535	113	25,645	152	7,550	1,449	169,533	39,103	3,525,922	46,396	4,672,585
Nov	2,785	345,340	8,275	948,774	639	97,817	107	2,770	6,866	803,322	62,027	4,355,947	80,699	6,553,970
Dec	811	100,571	2,854	413,898	560	85,642	205	11,180	6,424	751,608	44,384	5,747,948	55,238	7,110,847
Total	278,518	31,407,071	23,284	3,719,960	2,982	461,463	3,179	145,318	19,363	2,265,030	305,466	30,071,775	632,790	68,070,617
	O.niloticus		O.leucosticus		M.salmoides		C.gariepinus		M. carp		C. carp		Total	
	M. tonnes	000 Kshs	M. tonnes	000 Kshs	M. tonnes	000 Kshs	M. tonnes	000 Kshs	M. tonnes	000 Kshs	M. tonnes	000 Kshs	M. tonnes	000 Kshs
TOTAL	279	31,407	23	3,720	3	461	3	145	19	2,265	305	30,072	633	68,071

3.6 LAKE JIPE FISHERY

During the year 2014, a total of 115 metric tonnes of both Tilapia and Clarias with an ex-vessel value of Kshs 19,479,000 were landed from Lake Jipe. This reflected a decline of 0.9% (or 1 metric ton) in quantity and an increase of 13.8% in ex-vessel value compared to previous year 2013 production of 116 metric tonnes valued at Kshs 16,910,000. The only two species (Tilapia and Clarias) caught in the lake showed a steady average production of 8 metric tonnes per month for Tilapia and 1 metric ton for Clarias (Table 14). Tilapia contributed 85% (98 metric tonnes) and Clarias 15% (17 metric tonnes), figure 15.

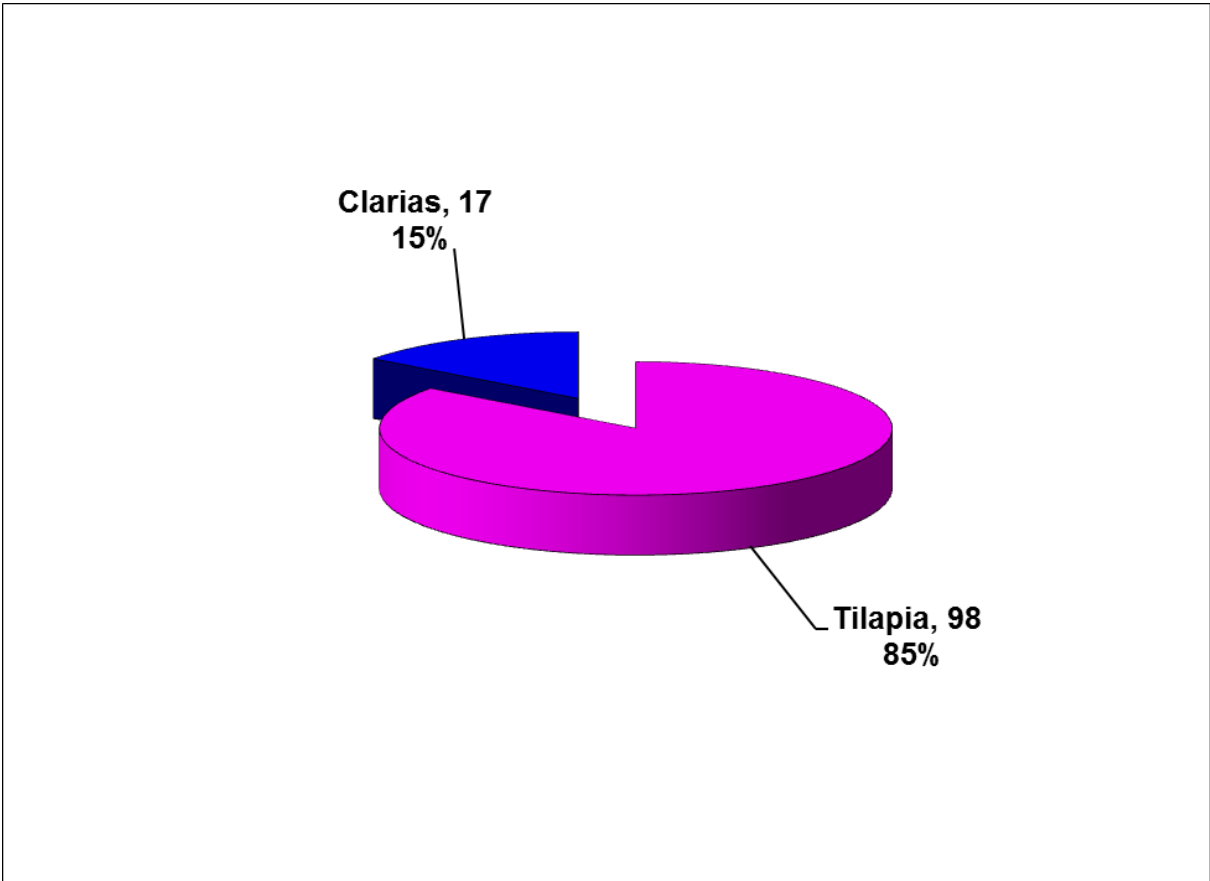


Figure 15: Percentages composition of species catch in Lake Jipe 2014

The challenges which faced capture fisheries in Lake Jipe during the year under review continued to included;

- Floating vegetation continued to stand out as the biggest problem faced by the fishers. The vegetation abstracts fishing crafts motion besides serving

as hiding ground for the fish hence impacting substantially on the low production;

- Siltation – there is observable high rate of silt deposition in the lake’s bed which is caused by among others sand harvesting activities on the banks of River Lumi and increased agricultural activities along the river course. The siltation has contributed to creation of a shallow inlet point in the lake which eventually brings about diversion of the river course off the lake and the water ends up in Nyumba ya Mungu resercoir in Mwanga district of Tanzania. The knock on effect accruing from this is and not limited to proliferation of water weeds, increased salinity and receding of the lake shoreline.

Table 13: Lake Jipe Monthly fish landings by Species, Weight and Value 2014

Month	Tilapia		Clarias		Total	
	M. tons	000 Kshs	M. tons	000 Kshs	M. tons	000 Kshs
Jan	9	1,531	1	203	10	1,734
Feb	8	1,460	1	188	10	1,649
Mar	8	1,405	1	149	9	1,554
Apr	8	1,355	1	193	9	1,548
May	8	1,404	2	230	10	1,634
Jun	8	1,334	2	237	9	1,571
Jul	7	1,281	2	213	9	1,494
Aug	8	1,318	1	188	9	1,505
Sep	8	1,376	1	165	9	1,541
Oct	8	1,426	1	131	9	1,557
Nov	8	1,451	2	226	10	1,677
Dec	9	1,547	2	239	11	1,785
Total	98	16,886	17	2,363	115	19,249

3.7 TANA RIVER DAMS FISHERY

A total of 1,024 metric tonnes of fish with an ex-vessel value of Kshs 98,311,000 were landed from the main fishery water bodies of the Tana River dams of Masinga, Kamburu, and Kiambere. This production reflected a decrease of 45.2% in quantity and 34.6% in ex-vessel value compared to 2013 figures of 705 metric tonnes valued at Kshs 73,024,000.

The most important species in the catches in 2014 were *Tilapia spp*, *Cyprinus carpio* (Common carp) and *Clarias gariepinus*. Landings of *Tilapia spp* were the highest at 490 metric tonnes (or 47.8%) followed by *Cyprinus carpio* 312

metric tonnes (30.5%) and *Clarias gariepinus* 220 metric tonnes (21.5%). The other species (the *Eels*, *Barbus spp*, *Labes spp* and *Mormyrus*) combined contributed 0.1% (Table 15). Tana River dam's fish production is determined by the level of water in the dams and this causes fluctuations of the total annual landing depending on the water level in the dams, figure 16.

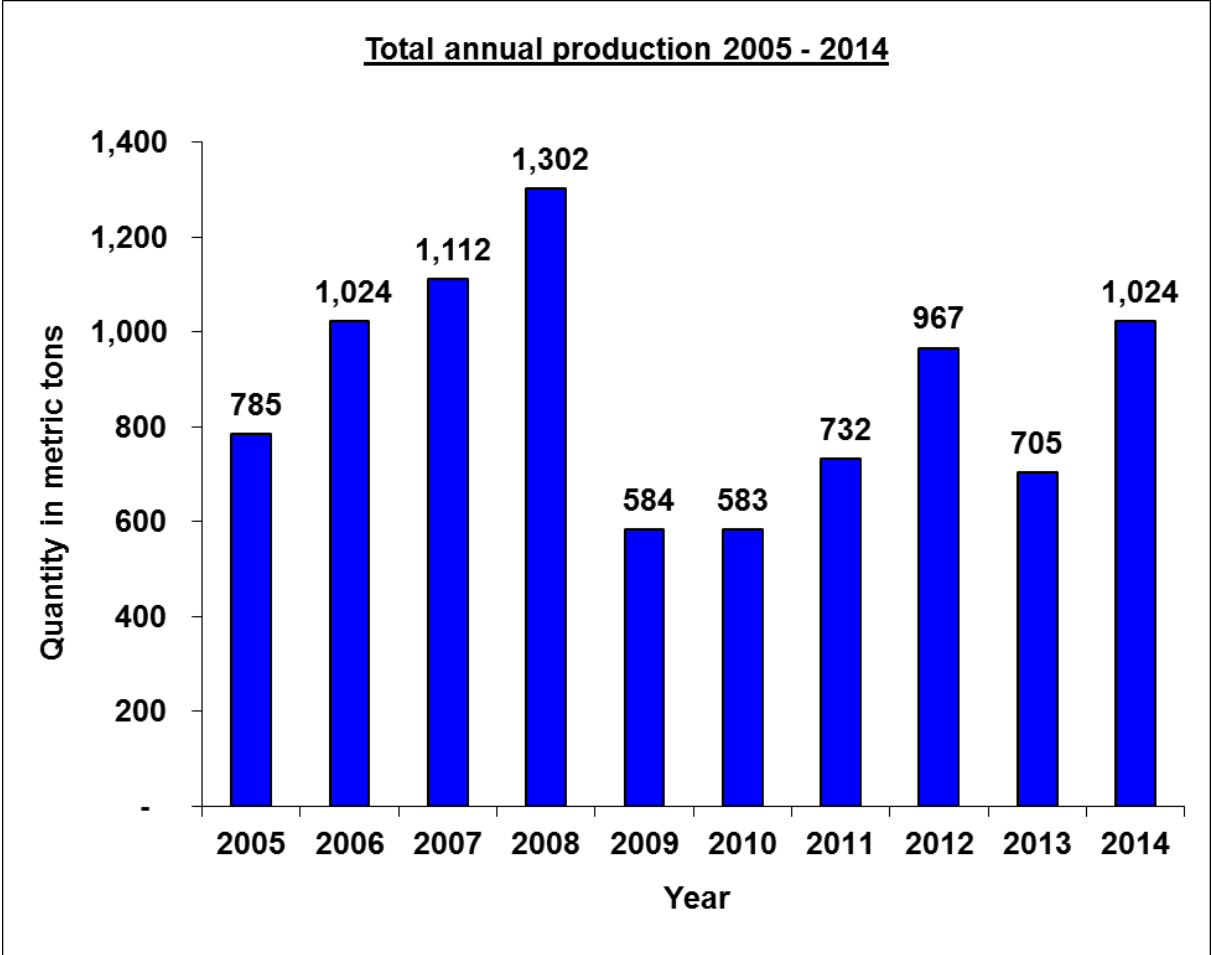


Figure 16: Tana River dams' fish catch trends in metric tonnes 2005 – 2014

Table 14: Tana River dams Monthly fish landings by Species, Weight and Value 2014

MONTH	Tilapia		Common carp		Clarias		Others		Total	
	M. tons	000 Kshs	M. tons	000 Kshs	M. tons	000 Kshs	M. tons	000 Kshs	M. tons	000 Kshs
Jan	45	3,968	23	1,868	20	2,155	0	8	88	7,999
Feb	57	5,072	23	2,251	25	2,294	0	7	104	9,624
Mar	66	6,068	24	2,462	21	2,408	0	8	111	10,946
Apr	40	2,762	33	2,774	20	2,108	0	6	93	7,651
May	45	3,071	23	1,970	18	1,909	0	8	87	6,958
Jun	40	2,751	25	2,131	18	1,899	0	5	83	6,787
Jul	34	3,233	31	3,045	18	2,235	1	60	84	8,574
Aug	33	3,337	27	2,646	18	2,265	0	12	78	8,261
Sep	30	3,002	25	2,443	16	2,006	0	8	71	7,459
Oct	32	3,106	26	2,372	15	1,710	0	6	73	7,194
Nov	33	3,278	25	2,309	15	1,622	0	10	73	7,218
Dec	35	4,411	27	3,358	15	1,862	0	10	77	9,641
Total	490	44,059	312	29,630	220	24,474	1	148	1,024	98,311

3.8 LAKE KENYATTA FISHERY

During the year under review a total of 51,142 Kgs of fish with an ex-vessel value of Kshs. 3,899,209 were landed from Lake Kenyatta in Lamu County of the coast province. This was a 5.8% decline in quantity of the fish landed but an increase of 3.4% in ex-vessel value compared with 2013 figures of 54,312 Kgs with an ex-vessel value of Kshs 3,770,411. The catch composition from this lake comprised of three species namely *Tilapia spp*, *Protopterus spp* and *Clarias spp*. *Tilapia spp* contributed 47.2% (24,142 Kgs) of the total catch, *Clarias spp* 27.2% (13,933 Kgs) and *Protopterus spp* 25.6% (13,066 Kgs), figure 17 and Table 15. The fishing effort was 120 fishers using 40 fishing crafts. Fishing was mainly passive with gillnetting, long line hooks and hand line hooks being the most common methods of fishing.

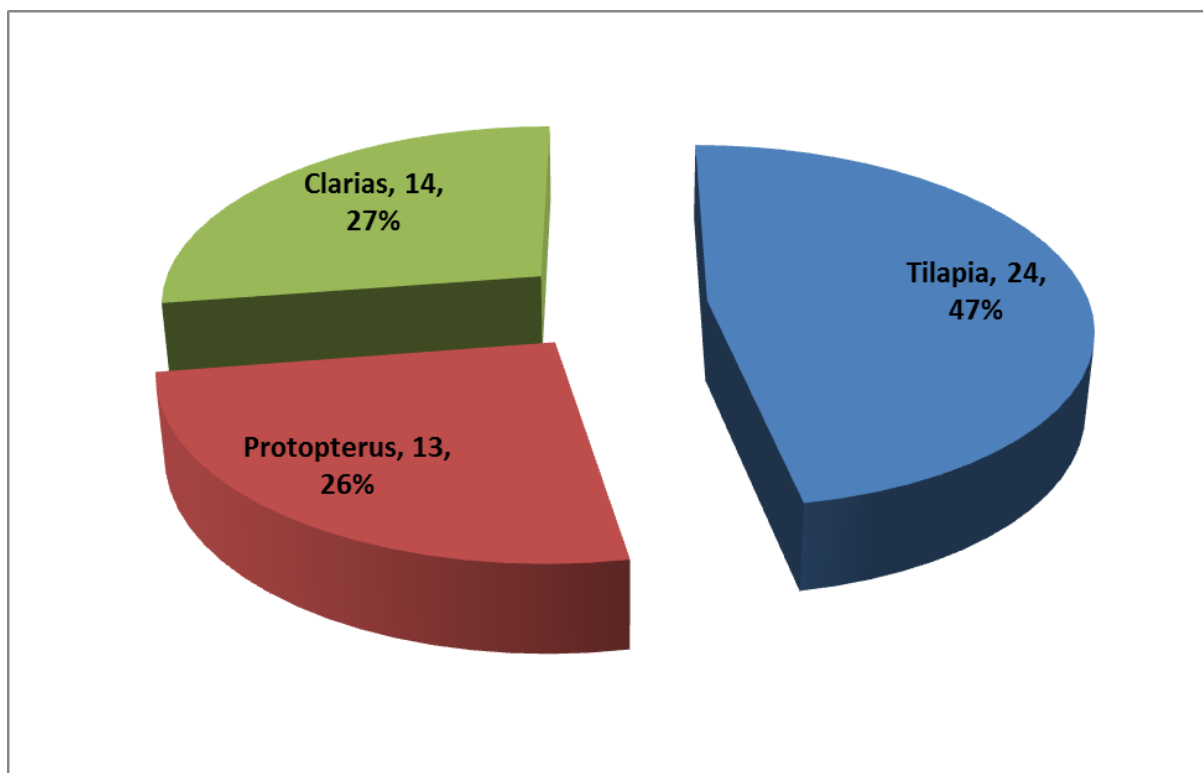


Figure 17: Percentages composition of species catch in Lake Kenyatta 2014

Table 15: Lake Kenyatta Monthly fish landings by Species, Weight and Value 2014

	Tilapia		Clarias		Protopterus		Total	
	Quantity (MT)	Value('000)	Quantity (MT)	Value('000)	Quantity (MT)	Value('000)	Quantity (MT)	Value('000)
Jan	2,237	90,682	685	63,727	668	52,119	3,590	206,528
Feb	1,831	74,254	1,975	183,856	1,312	102,290	5,117	360,400
Mar	1,017	40,741	2,277	211,934	1,249	97,419	4,543	350,095
Apr	1,017	42,713	2,277	211,934	1,686	131,515	4,980	386,163
May	2,644	201,078	1,424	132,581	2,692	209,937	6,760	543,597
Jun	2,237	71,626	679	63,239	44	3,410	2,960	138,274
Jul	2,237	95,939	682	63,483	6	487	2,926	159,909
Aug	2,644	245,763	818	76,179	56	4,384	3,519	326,326
Sep	1,424	126,167	892	83,016	1,274	99,367	3,590	308,550
Oct	2,644	243,134	884	82,283	2,436	189,967	5,964	515,384
Nov	3,458	298,332	889	82,772	1,168	91,087	5,515	472,190
Dec	610	52,570	451	41,996	475	37,019	1,536	131,585
Total	24,000	1,583,000	13,933	1,297,000	13,066	1,019,000	51,142	3,899,209
	M. tons	000 Kshs	M. tons	000 Kshs	M. tons	000 Kshs	M. tons	000 Kshs
Total	24	1,583	14	1,297	13	1,019	51	3,899

3.9 LAKE KANYABOLI FISHERY

Lake Kanyaboli is one of the satellite lakes of Lake Victoria and it is located in Siaya County. The fisheries of the lake are comprised of the following fish species: *Oreochromis niloticus*, *Protopterus aethiopicus*, *Haplochromis* and *Clarias spp.* A total of 134 metric tonnes with an ex-vessel value of Kshs 10,467,781 were landed from the lake during the year under review. This was a 30.9% decline in quantity of the fish landed coupled with a 12.8% decline in ex-vessel value compared with 2013 figures of 194 metric tonnes with a value of Kshs 12,003,895.

The main species in catches were Tilapia which contributed 54.5% (73 metric tonnes) of the total catch followed by Clarias 19.3% (26 metric tonnes), Protopterus 18.5% (25 metric tonnes) and Haplochromis 7.7% (10 metric tonnes), figure 18 and Table 16. The fishing activities were undertaken by 188 fishers operating 99 fishing crafts.

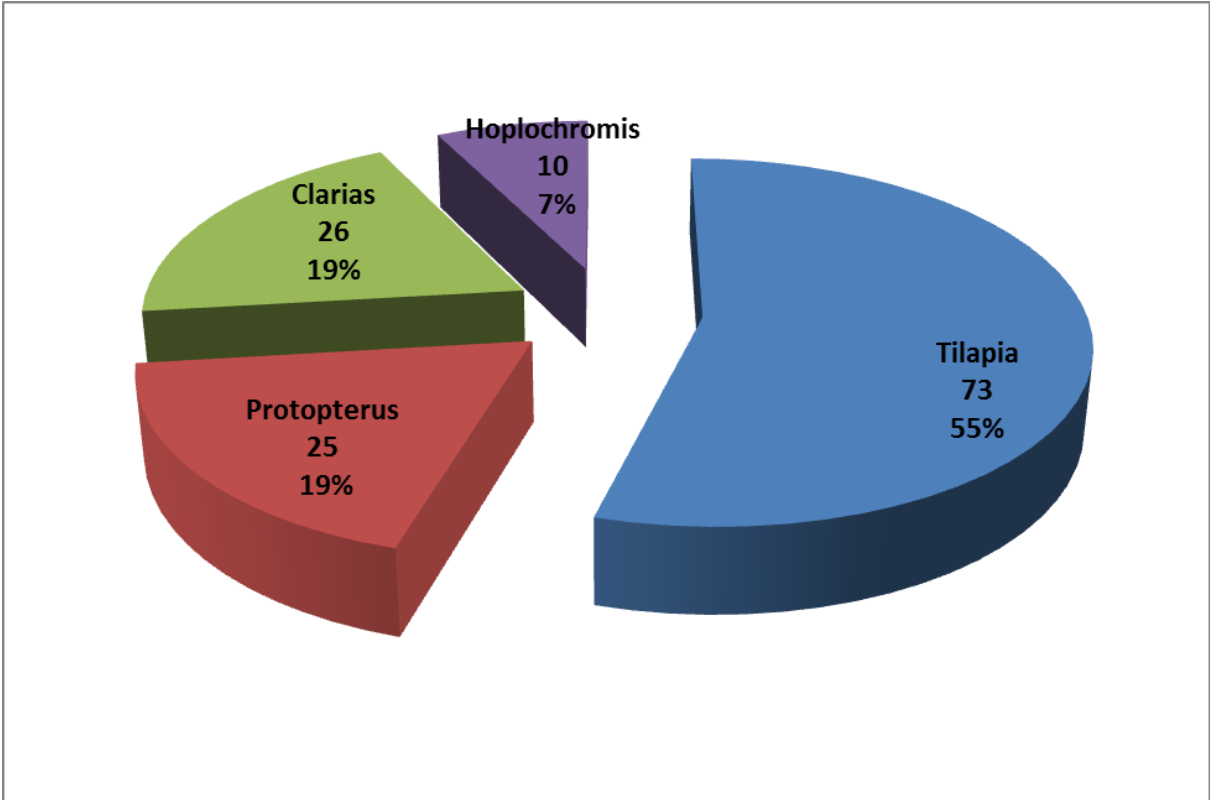


Figure 18: Percentages composition of species catch in Lake Kanyaboli 2014

Table 16: Lake Kanyaboli Monthly fish landings by Species, Weight and Value 2014

	Tilapia		Protopterus		Clarias		Haplochromis		Total	
	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs
Jan	4,242	317,320	962	83,435	1,843	159,434	1,441	85,786	8,488	645,976
Feb	9,645	721,546	2,817	244,228	2,393	206,965	1,025	61,002	15,879	1,233,741
Mar	3,505	262,230	1,434	124,329	2,991	258,706	1,499	89,239	9,429	734,504
Apr	9,888	739,726	2,857	247,730	2,631	227,607	1,435	85,403	16,811	1,300,466
May	5,138	384,324	1,677	145,445	1,044	90,309	660	39,287	8,519	659,365
Jun	3,707	277,311	1,974	171,197	906	78,359	532	31,690	7,120	558,557
Jul	6,384	477,564	840	72,825	1,209	104,569	483	28,775	8,916	683,733
Aug	5,419	405,396	2,270	196,845	967	83,655	419	24,938	9,075	710,834
Sep	4,760	356,090	2,590	224,554	2,959	255,990	703	41,819	11,012	878,453
Oct	7,675	574,110	2,464	213,635	2,727	235,891	612	36,448	13,478	1,060,084
Nov	8,028	600,554	2,536	219,919	3,286	284,237	843	50,183	14,693	1,154,892
Dec	4,688	350,719	2,352	203,953	2,967	256,669	602	35,834	10,610	847,174
Total	73,080	5,466,891	24,773	2,148,095	25,924	2,242,392	10,254	610,403	134,031	10,467,781
	M.		M.		M.		M.	000	M.	000
	tons	000 Kshs	tons	000 Kshs	tons	000 Kshs	tons	Kshs	M. tons	000 Kshs
Total	73	5,467	25	2,148	26	2,242	10	610	134	10,468

3.10 TAKWEL DAM

Turkwel Dam is one of the major Hydro Electric Power Station in Kenya. It is situated in North West of Kenya, in the border of Turkana, West Pokot and Pokot North Sub-Counties. The dam was constructed under the control of Kerio Valley Development Authority (KVDA) from 1986 to 1991 and is still under the management of KVDA. The State Department of Fisheries has been working with KVDA and Moi University on the introduction of fish in this Dam for commercial exploitation since 2006. The dam has an area of 66 square Km with a capacity of 1,641 cubic metres. Data of fish landings from the dam were recorded for the first time in 2013 and the again during the year under review.

During the year a total of 56 metric tonnes of fish with an ex-vessel value of Kshs 11,547,324 were landed from the dam. This was a 4.6% decline in quantity of the fish landed coupled with a 2.5% decline in ex-vessel value compared with 2013 figures of 59 metric tonnes with a value of Kshs 11,849,226. The fisheries of the dame are comprised of two species: Tilapia (*Oreochromis niloticus*) and *Clarias spp.* Tilapia landings contributed 93.9% (53 metric tonnes) while Clarias contributed 6.1% (3 metric tonnes) during the review period, figure 19. Average monthly catches were between 4.6 metric tonnes, figure 20 and Table 17.

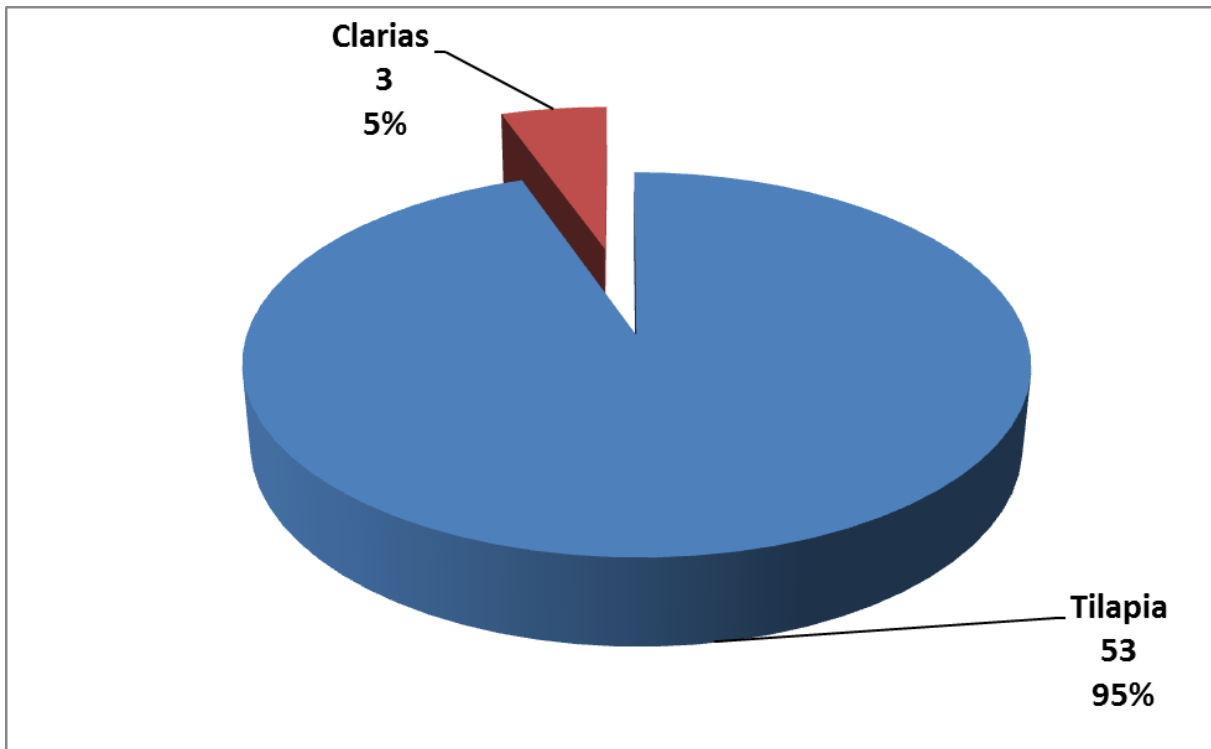


Figure 19: Percentages composition of species catch in Takwel dam 2014

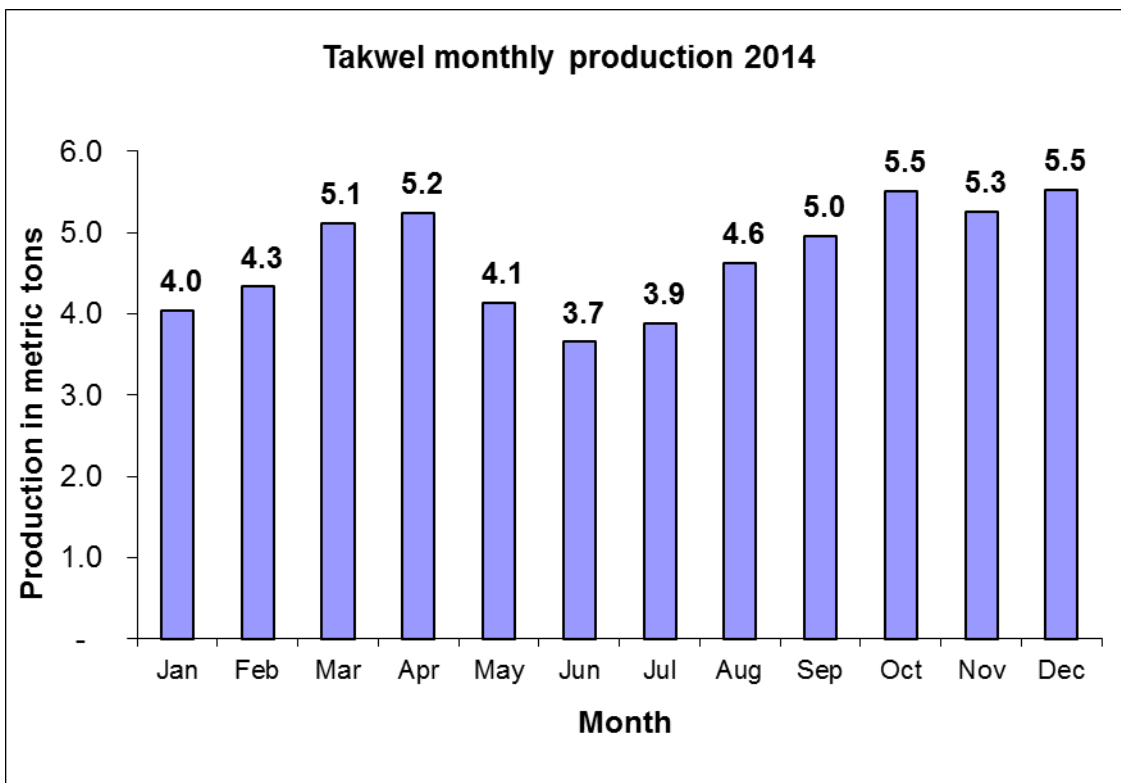


Figure 20: Takwel dam monthly fish catches in metric tonnes 2014

Table 17: Turkwel dam Monthly fish landings by Species 2014

Month	Tilapia		Clarias		Total	
	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs
Jan	3,658	750,380	380	77,962	4,038	828,342
Feb	4,047	830,291	285	58,471	4,332	888,762
Mar	3,971	814,699	1,140	233,885	5,111	1,048,584
Apr	3,890	798,132	1,349	276,764	5,239	1,074,896
May	3,990	818,597	152	31,185	4,142	849,782
Jun	3,648	748,431	5	975	3,653	749,406
Jul	3,881	796,183	2	234	3,883	796,417
Aug	4,617	947,234	14	2,924	4,631	950,157
Sep	4,950	1,015,450	8	1,559	4,957	1,017,009
Oct	5,491	1,126,545	23	4,678	5,514	1,131,223
Nov	5,227	1,072,362	28	5,847	5,255	1,078,209
Dec	5,496	1,127,520	34	7,017	5,530	1,134,536
TOTAL	52,865	10,845,824	3,420	701,499	56,285	11,547,323
	M tonnes	000 Kshs	M tonnes	000 Kshs	M tonnes	000 Kshs
Total	53	10,846	3	701	56	11,547

3.11 TANA RIVER DELTA

Fresh water fish landings from Tana River delta in Tana River County during the year under review amounted to 47,484 Kgs with an ex-vessel value of Kshs 3,574,214. This was an increase of 3.3% in quantity of the fish landed coupled with a 11.5% increase in ex-vessel value compared 45,971 Kgs with an ex-vessel value of Kshs 3,204,175 landed in 2013. The landings comprised of *Clarias spp* 23,454 Kgs (49.6%), *Tilapiines* 12,474 Kgs (26.3%) and *Protopterus spp* 11,465 Kgs (24.1%), figure 21 and Table 18.

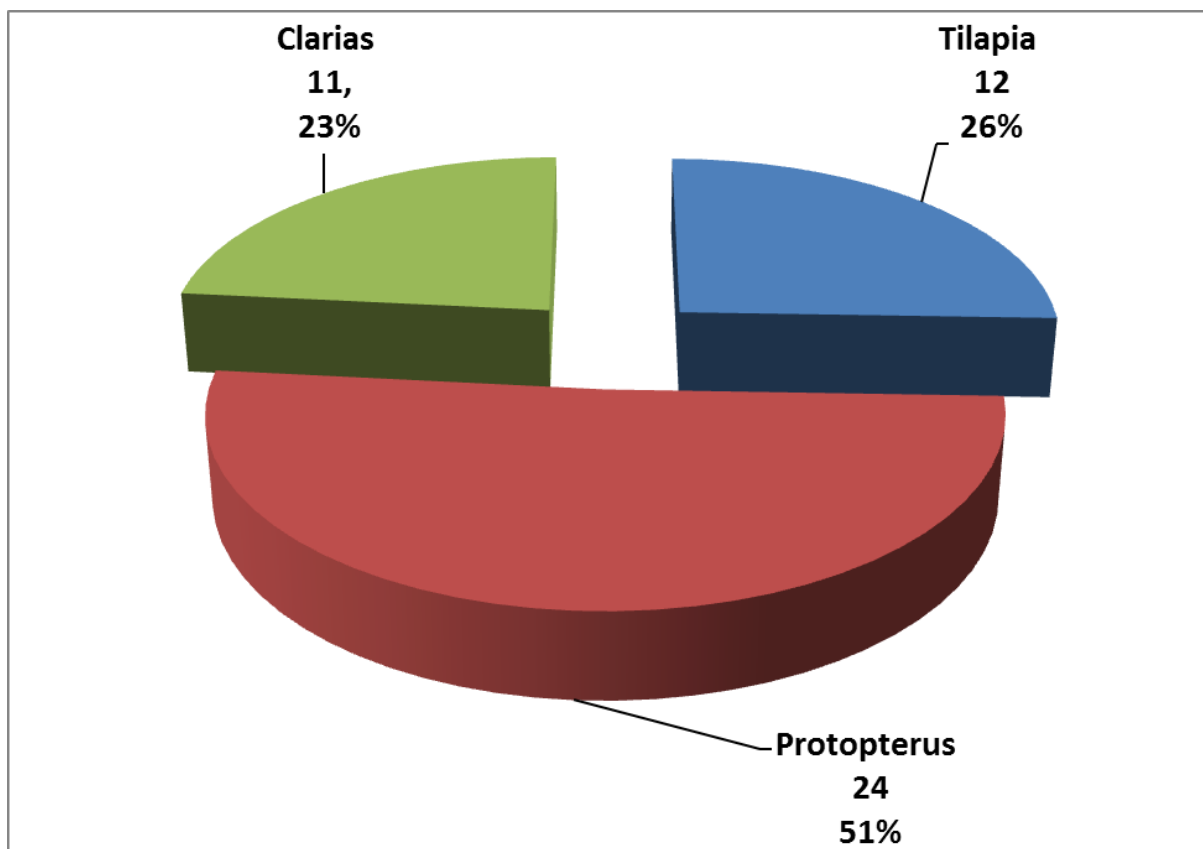


Figure 21: Percentages composition of species catch in Tana river delta 2014

Table 18: Tana River delta freshwater monthly fish landings by Species 2014

Month	Tilapia		Clarias		Protopterus		Total	
	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs	Kgs	Kshs
January	956	65,228	1,678	146,011	505	47,321	3,139	258,560
February	741	57,132	1,596	136,333	689	64,023	3,026	257,488
March	822	58,761	2,101	124,449	759	68,576	3,682	251,786
April	967	68,773	2,111	169,226	953	70,545	4,031	308,544
May	1,105	74,442	2,867	170,993	887	72,749	4,859	318,184
June	941	63,667	1,584	151,345	754	69,012	3,279	284,024
July	886	60,239	2,208	155,887	677	62,041	3,771	278,167
August	1,186	77,312	2,006	160,587	619	60,112	3,811	298,011
September	1,269	81,338	2,149	204,332	2,148	120,035	5,566	405,705
October	1,464	98,767	2,608	189,213	598	52,243	4,670	340,223
November	760	50,442	1,886	151,247	2,177	128,045	4,823	329,734
December	1,377	87,226	751	90,442	699	66,120	2,827	243,788
Total	12,474	843,327	23,545	1,850,065	11,465	880,822	47,484	3,574,214
	M.tons	000Kshs	M.tons	000Kshs	M.tons	000Kshs	M.tons	000Kshs
Total	12	843	24	1,850	11	881	47	3,574

4.0 AQUACULTURE (FISH FARMING)

Aquaculture has been practiced in one form or another in many parts of country since colonial times. It has also been considered as a rural activity with increasing awareness of the economic benefits, and with the dwindling capture fisheries, aquaculture had been considered as an alternative in the fish production in the country.

The State Department of Fisheries has aggressively been promoting aquaculture development in the country to counter the declining production from capture fisheries. Aquaculture, being a food production sub sector, is being mobilized to positively contribute towards food security, generate income and create employment to our young generation.

To enhance aquaculture production, up to date (end of 2014), the State Department has trained fishers, implementing officers and stakeholders on fish farming practises; conducted a national aquaculture suitability appraisal and developed suitability maps for 210 Constituencies in the country; developed a fish breeding structure with a holding capacity of over 200,000 brood-stock; developed fish feed specifications for tilapia, catfish and trout and related supply chain; procured 54 Fish Feed Pelletizing machines and distributed them to the constituencies; procured 148 Motorcycles and recruited 286 Fisheries Extension Officers for extension service delivery in the constituencies; constructed (4) Fish Processing Plants in Tetu, Imenti South, Rongo and Lurambi constituencies; constructed a state of the art fish processing factory in Mitunguu, Meru County in collaboration with private sector investors; constructed 3 Recirculation Aquaculture Systems (RAS) in Kiambaa (Jambo Fish Farm & Samaki Tu Fish Farm) and Kisumu Rural (Thinqubator Fish Farm) Constituencies; constructed over 69,688 fish ponds country-wide (46,824 fish ponds in 160 Constituencies country-wide by GOK, and some other 22,864 ponds under the multiplier effect by farmers and investors and stocked them with over 100 million fingerlings; increased the area under aquaculture from 722 hactares in 2008 to 2,090.6 hactares in 2014; increased national aquaculture production in the last ten years from 1,047 metric tonnes in 2005 to 24,096 metric tonnes in 2014.

Fish farming production during the year (2014) was 24,095,999 Kgs (24,096 metric tonnes) with a farm gate value of Kshs. 5,601,721,944 compared to 23,500,812 Kgs (23,501 metric tonnes) valued at Kshs. 5,522,735,483 in 2013. This production was from 69,688 ponds with an area of 20,906,400 metres square (2,091 hectares), 161 tanks measuring 23,085 metres square and 124 reservoirs with an area of 744,000 square metres throughout the country. Over

the last ten years, fish production has increased from as low as 1,047 metric tonnes produced in year 2005 to the present production of 24,096 metric tonnes, figure 22.

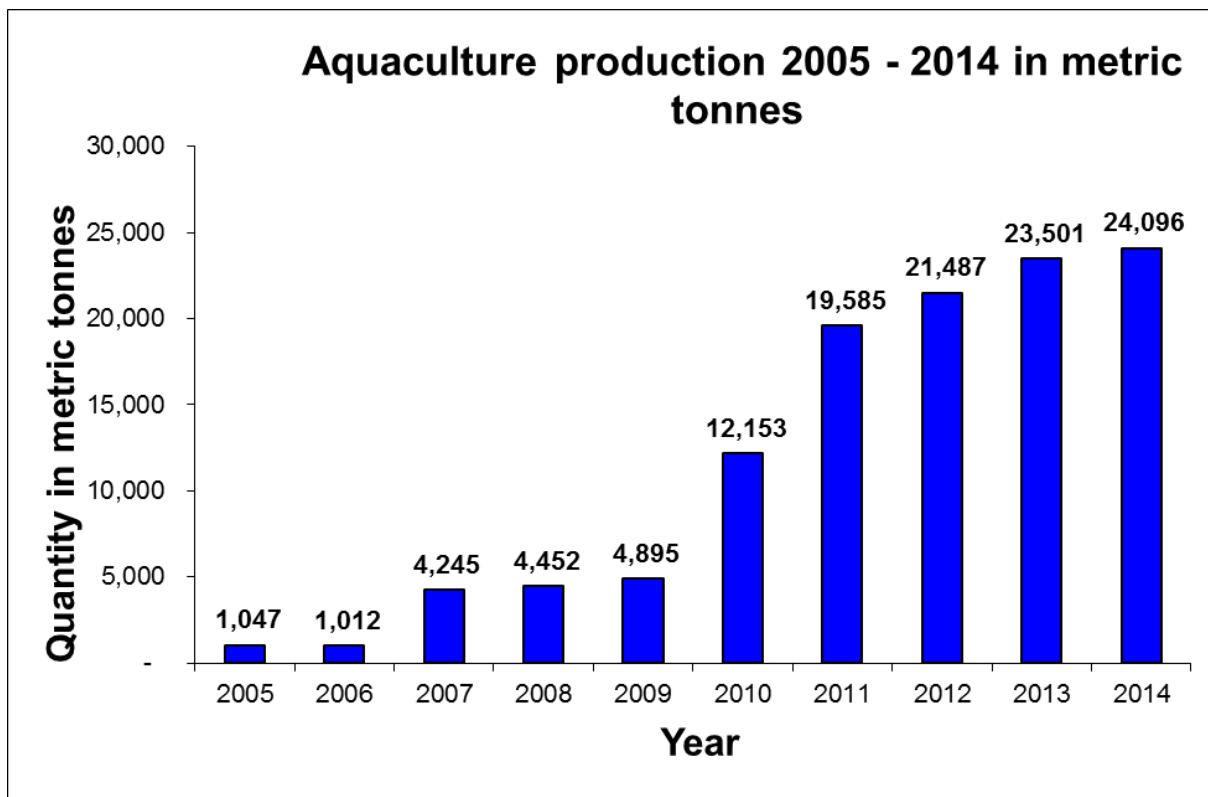


Figure 22: Aquaculture production for last ten years (2005-2014)

The following constraints continued to affect aquaculture activities during the year under review:

- ◆ Inadequate readily available and affordable quality fish seed (fingerlings);
- ◆ Inadequate good quality and affordable fish feeds;
- ◆ Poor adoption of fish husbandry techniques by some farmers even after being trained on basic pond management;
- ◆ Water scarcity due to other competing uses – industry, domestic and agriculture;
- ◆ Inadequate market information for use by fish farmers;
- ◆ Lack of good credit facilities and schemes for fish farmers;
- ◆ Security and safety of fish in ponds posed by thieves and predators;
- ◆ Poor book keeping and record management leading to inaccurate data from farmers along the aquaculture value chain e.g. input costs, management cost, quantities of fish harvested and value;
- ◆ Sub optimal staffing levels especially extension personnel;
- ◆ Inadequate facilitation in terms of transport and timely funds towards carrying out of fisheries extension service provision.

The State department of fisheries policy on shifting fish farming from subsistence to commercial enterprise demands increased and reliable fish seed and feed production for the farmers.

5.0 EXPORTS OF FISH AND FISHERY PRODUCTS

During the year under review, a total of 6,290 metric tonnes of fish and fishery products were exported earning the country Kshs. 2,493,901,000 in foreign exchange. In quantity, exported fish products were mainly Nile perch products and its by-products totaling 4,980 metric tonnes or 79.2% of the total exports (i.e. fillets 4,119 metric tonnes or 65.5%, Headless and Gutted whole Nile perch 459 metric tonnes or 7.3% and fish maws 402 metric tonnes or 6.4%), Octopus 508 metric tonnes (8.1%), Fish meal 300 metric tonnes (4.8%) and marine shells 194 metric tonnes (3.1%), table 19. This year's Nile perch products and by-products export of 4,980 metric tonnes was a decreased of 13.9% from the previous years' export of 5,783 metric tonnes. By country destination, Netherlands had the lion's share of Nile perch products exports at 1,593 metric tonnes or 32.1%. Netherlands was followed by Israel with 658 metric tonnes (13.2%), UAE 559 metric tonnes (11.1%), Germany with 327 metric tonnes (6.6%), Uganda 321 metric tonnes (6.4%), Portugal 270 metric tonnes (5.4%), USA 195 metric tonnes (3.9%), Greece 179 metric tonnes (3.6%), France 133 metric tonnes (2.7%), China 110 metric tonnes (2.2%), Spain 105 metric tonnes (1.1%) and Australia with 103 metric tonnes (2.1%) among others whose total contribution was 431 metric tonnes (8.7%), figure 23.

The main markets for the marine ornamental fishes were the EU, USA, China and Japan.

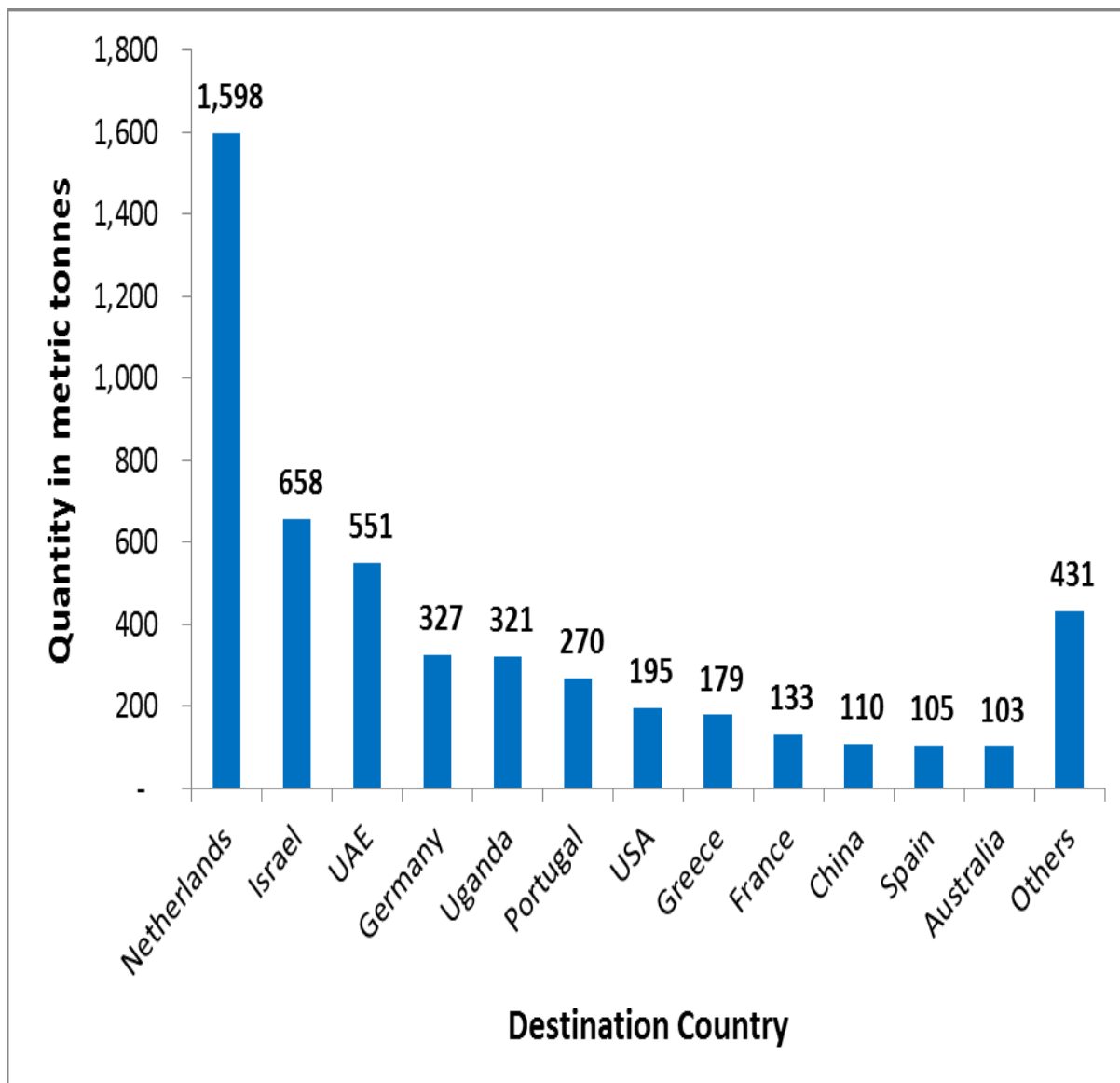


Figure 23: Exports of Nile Perch Products by destinations- 2014

By Nile perch products and by-products type, exports of chilled fillets contributed the highest percentage of 53.7% (2,676 metric tonnes) followed by frozen fillets 29.0% (1,444 metric tonnes), chilled headless and gutted whole Nile perch 8.9% (445 metric tonnes), frozen maws 8.1% (402 metric tonnes) then frozen headless and gutted whole Nile perch 0.3% (14 metric tonnes), figure 24.

Apart from the above mentioned exports, 5,602 metric tonnes of Tuna loins were processed at a labour charge of Kshs. 778,107,000 and trans-shipped through the port of Mombasa. This quantity was an increase of 271% from the previous year's trans-shipment of 1,509 metric tonnes.

The main constraints faced by all exporters of fish and fishery products during the year under review may be summarized as follows:

- i) International competition;
- ii) Insufficient raw materials

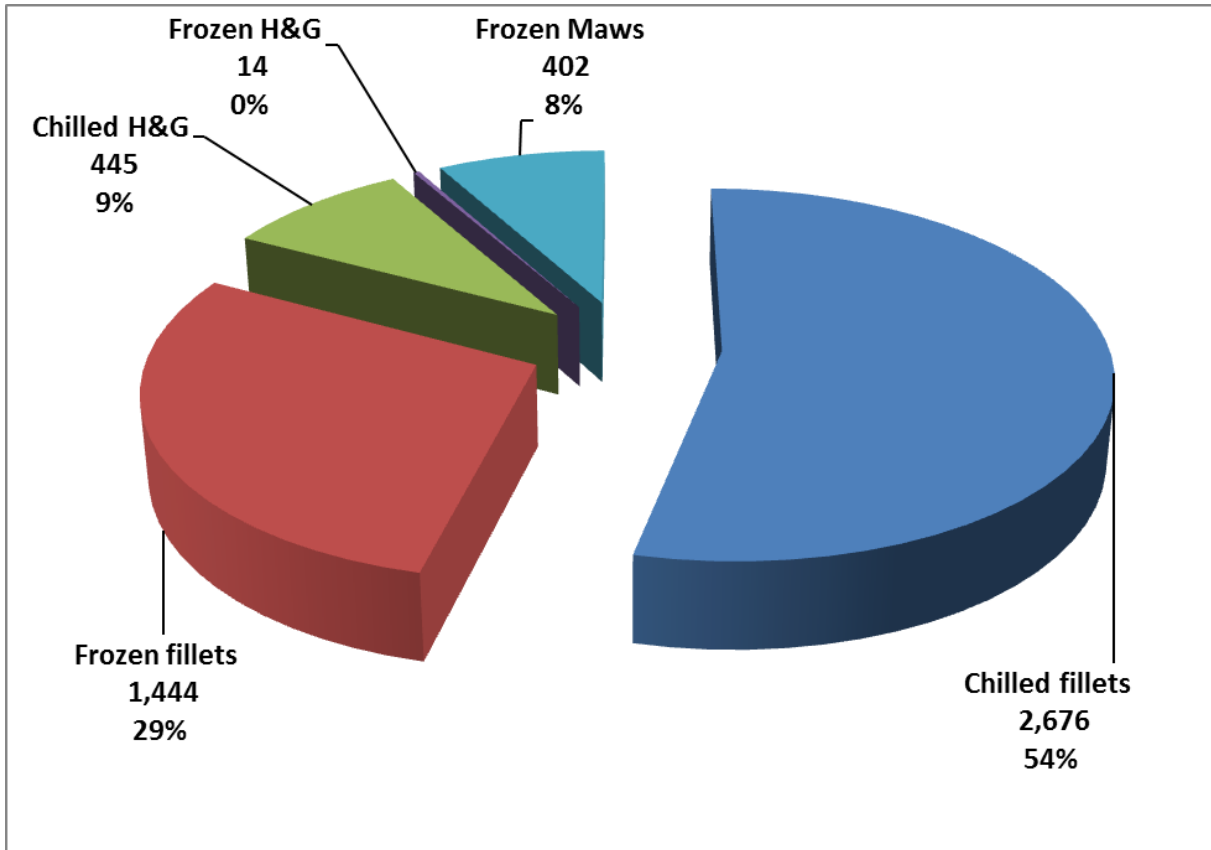


Figure 24: Exports of Nile perch by product type 2014

Table 19: Exports of Fish and Fishery Products 2014

Commodity	M. Tons	000Kshs	% Quantity	% Value
Nile perch Fillets	4,119	1,739,785	65.5	69.8
Frozen Octopus	508	160,115	8.1	6.4
H & G Whole Nile perch	459	165,455	7.3	6.6
Fish maws	402	227,986	6.4	9.1
Fish Meal	300	24,047	4.8	1.0
Marine shells	194	12,411	3.1	0.5
Frozen Mixed fish	94	13,382	1.5	0.5
Frozen Lobsters	82	73,179	1.3	2.9
Frozen Snappers	57	27,925	0.9	1.1
Live Crabs	22	7,902	0.3	0.3
Frozen fish fillets	14	7,725	0.2	0.3
Frozen Seabream	13	6,042	0.2	0.2
Live Lobsters	8	5,797	0.1	0.2
Shark fins	6	4,191	0.1	0.2
Frozen Crabs	5	1,194	0.1	0.0
Bech-der-mer	4	1,241	0.1	0.0
Frozen Squids	1	217	0.0	0.0
Sub Total	6,290	2,478,593	100.0	
	Pieces			
Marine Ornamentals	358,496	15,308		0.6
TOTAL	6,290	2,493,901		100.0
Tuna loins	5,602	778,107		
Grand total	11,892	3,272,008		

6.0 IMPORTS OF FISH AND FISHERY PRODUCTS

In 2014, Kenya imported 5,853 metric tonnes of fish and fishery products worth Kshs 640,006,000. These imports were mainly composed of frozen Mackerels with 2,657 metric tonnes which was 45.4% of the total fish and fishery products imported during the year. These were followed by *Tilapia niloticus* 1,805 metric tonnes (30.8%), Sardines 242 metric tonnes (4.1%), fish meal 236 metric tonnes (4.0%), frozen Pangasius fillets 236 metric tonnes (4.0%), mixed marine fish 190 metric tonnes (3.3%), frozen Herrings 85 metric tonnes (2.8%) and frozen Tuna 82 metric tonnes (1.4%) among others, figure 25 and table 20. The imports originated largely from Asian countries, notably China, Korea, Yemen, India, Japan and Vietnam but all the *Tilapia niloticus* was imported from China.

Some 1,245,000 Trout ova and 47,030 pieces of aquarium fish worthy Kshs 2,492,000 and 1,285,000 respectively were also imported during the year under review.

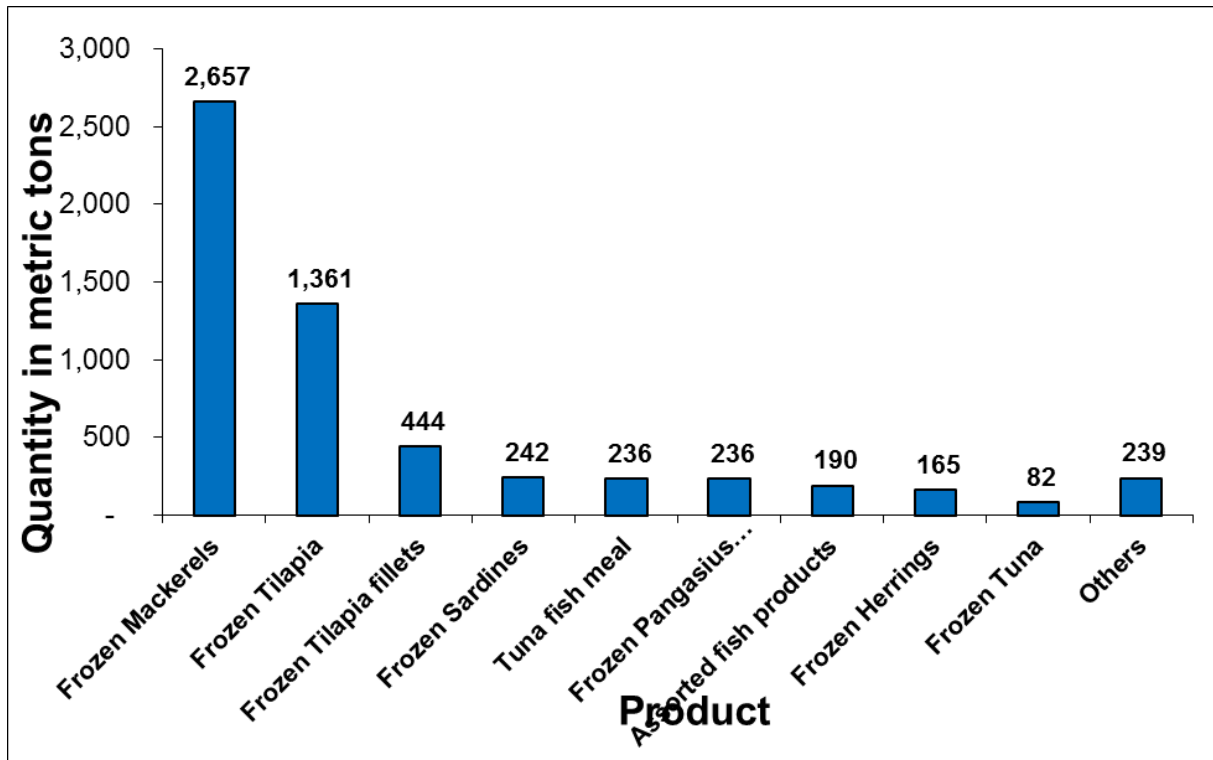


Figure 25: Import of fish and fish products 2014

Table 20: Imports of Fish and Fishery Products 2014

Product	Quantity (M. Tons)	Quantity (Pieces)	Value ('000Kshs)	% Quantity	% Value
Frozen Mackerels	2,657	-	205,640	45.4	32.1
Frozen Tilapia	1,361	-	142,401	23.3	22.2
Frozen Tilapia fillets	444	-	148,555	7.6	23.2
Frozen Sardines	242	-	10,477	4.1	1.6
Tuna fish meal	236	-	24,874	4.0	3.9
Frozen Pangasius Fillets	236	-	21,715	4.0	3.4
Assorted fish products	190	-	27,849	3.3	4.4
Frozen Herrings	165	-	8,930	2.8	1.4
Frozen Tuna	82	-	5,650	1.4	0.9
Canned seafood	64	-	15,365	1.1	2.4
Frozen salmon	51	-	13,216	0.9	2.1
Frozen Moonfish	27	-	1,184	0.5	0.2
Frozen mullets	27	-	1,489	0.5	0.2
Frozen Bonito	25	-	986	0.4	0.2
Fresh Salmon	13	-	1,585	0.2	0.2
Frozen Moro Fish	13	-	1,639	0.2	0.3
Frozen Shrimps	5	-	1,404	0.1	0.2
Dried Sharks	4	-	80	0.1	0.0
Dried Fish	3	-	90	0.1	0.0
Frozen Prawns	3	-	1,323	0.1	0.2
Capelin fish Oil	2	-	714	0.0	0.1
Cod Liver Oil	2	-	992	0.0	0.2
Crabs sticks	0	-	70	0.0	0.0
Sub Total	5,853	-	636,229	100.0	
Aquarium fish	-	47,030	1,285		0.2
Trout ova	-	1,245,000	2,492		0.4
TOTAL	5,853	1,292	640,006		100.0