REPUBLIC OF KENYA

MINISTRY OF AGRICULTURE, LIVESTOCK, FISHERIES & COOPERATIVES

STATE DEPARTMENT FOR FISHERIES AND THE BLUE ECONOMY

KENYA FISHERIES SERVICE




FISHERIES ANNUAL STATISTICAL BULLETIN 2021

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1.0 INTRODUCTION

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 Km^2), Lake Victoria-Kenyan side (6% of the whole lake - 4,128 km^2), Naivasha (210 Km^2), Baringo (129 Km^2) and Lake Jipe (39 Km^2). Major rivers include Tana (700 Km^2), 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). Across the country, there are also dams stocked with fish in areas like Uasin Gishu, Narok and Laikipia, where fish production is quite substantial.

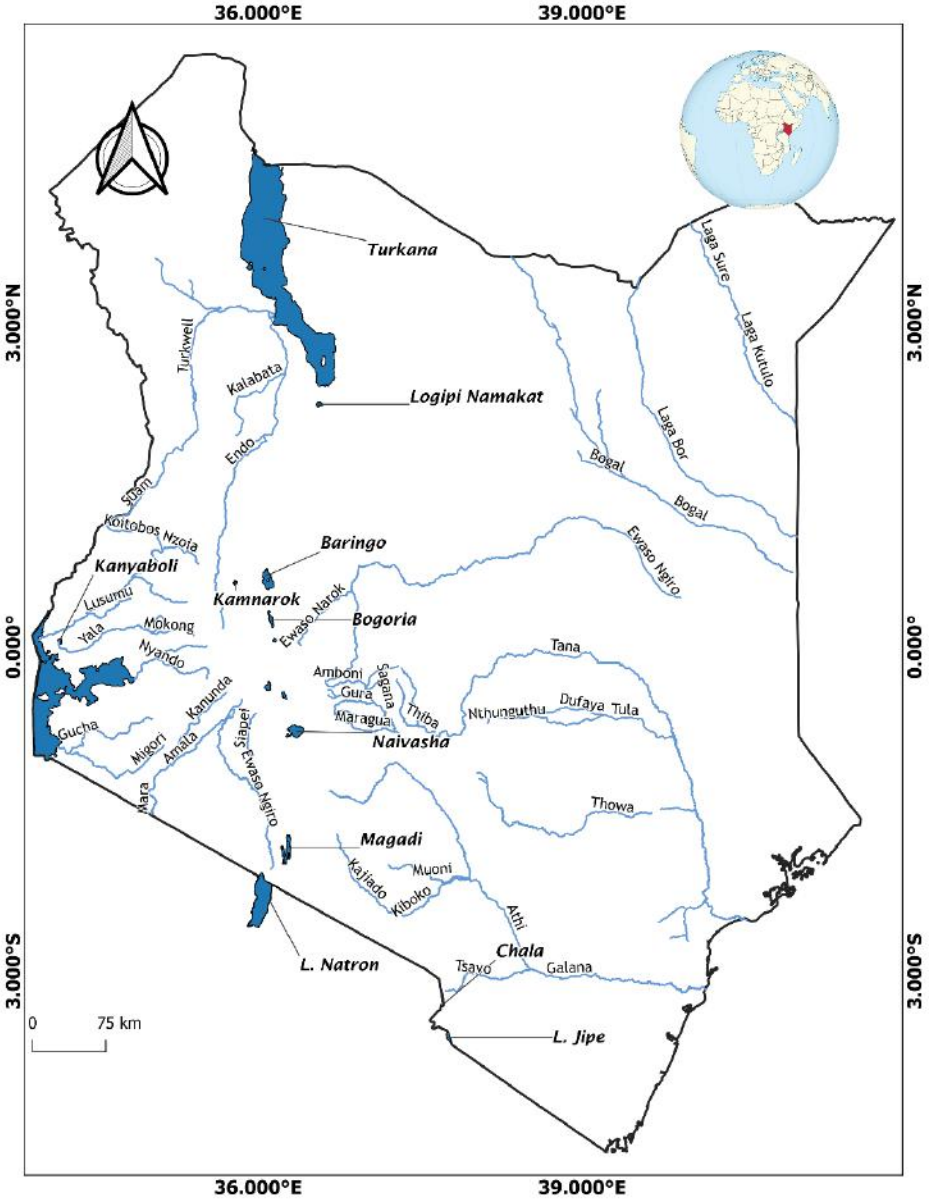

Figure 1. 1 Figure showing the water resources in Kenya.

Further to these inland water resources, Kenya also enjoys a vast coastline of 640 km on the Western Indian Ocean and a further 200 nautical miles Exclusive Economic Zone (EEZ) under Kenyan jurisdiction. The total area of the territorial waters is 9,700 Km^2 while the Kenyan EEZ is 142,400 Km^2. Kenya also lays claim to extended EEZ, reaching 350 km with an extra area of approximately 103,320 Km^2. The total area for exploitation by the country is a massive 255,420 Km^2 which is about half of the Kenyan land cover area.

The Kenyan fishery is mainly artisanal with very few commercial/industrial vessels targeting mainly shallow water shrimps, deep water shrimps and lobsters. The country has been developing the industrial fleet and is currently having four longliners and six purse seiners mainly targeting Tuna and Tuna like species in our Economic Exclusive Zone (EEZ). The artisanal fishery accounts for most of the inland and marine water catches reported here 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.

The fisheries sector also plays a significant role in employment and income generation. During the year 2021 the sector supported a total of 65,000 people directly as fishermen and 70,000 fish farmers with 149,000 stocked 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. In 2021, the total fish production was 163,702 metric tons worth 30.38 billion Kenya shillings. This was an 8.2% increase in production compared to 151,289 tons worth 26.25 billion Kenya shillings landed in 2020. The increase in the value was mainly due to the catches from industrial vessels and the increase in prices for areas with less production based on the demand and supply impacts on the fish prices.

As has been the trend in the past, most of the production was from inland capture fisheries amounting to 115,353 metric tons with an ex-vessel value of Ksh. 17.4 billion. The fish production from marine and aquaculture was 27,306 and 21,076 metric tons worth Ksh. 6.2 and 6.7 billion shillings respectively.

Inland capture fisheries contributed 71% of Kenya's total fish production, with the principal catches coming from Lake Victoria. The lake accounted for 94,349 metric tons which was a 7% increase in catch compared to 88,223 MT caught the previous year. The increase was attributed to relaxed Covid-19 pandemic restriction and resumption of normal fishing hours. Lake Turkana, the world's largest desert lake, produced 15,644 metric tons of fish during the year under review. This

amounted to a 19% increase compared to 13,190 MT caught in 2020. This increase is mainly as a result improved recruitment due to raised water level and flooding of Ferguson Gulf and other critical fish habitats in the year 2020. Other freshwater-bodies of commercial importance whose catches increased in 2021 were lakes Baringo, Jipe and Kanyaboli. The catches from the lakes in 2021 were 406 MT, 218 MT and 1652 MT respectively compared to 162 MT, 197 MT and 264 MT in 2020. The increase was 526% for Kanyaboli, 151% for Lake Baringo and 11% for Lake Jipe. Lake Naivasha registered a 19% decline in production 1804 MT in comparison with 2216 MT landed in 2020. Other water bodies that recorded a decline catch were Lake Kenyatta (77), Tana River dams (197), Turkwel (98) and riverine (393) which 54%, 30%, 8% and 4% respectively. Tana River Delta and contribution from small dams across the country improved 114% and 6% respectively.

Marine artisanal production increased from 23,646 MT worth 4.84 billion in 2020 to 25,380 MT worth 5.49 billion in 2021. Marine industrial fishing increased for the shallow prawn trawling, deep water trawling and deep-water crab pottery but decreased for deep sea longlining. Deep water trawling is undertaken from November to March while shallow water trawling commences from April to October. Deep water trawl catches increased from 943 MT to 1026 MT while deep water crab catches increased from 86 MT to 137 MT. Shallow water trawling catches increased to 330 MT from 273 MT while longline catches declined to 432.6 MT from 670 MT (Table 1.1).

Table 1. 1 Quantity and Value of fish landings 2017 – 2021

	2017		2018		2019		2020		2021	
Fresh Water	**M. Tons**	**Value '000 Kshs.**	**M. Tons**	**Value '000 Kshs.**	**M. Tons**	**Value '000 Kshs.**	**M. Tons**	**Value '000 Kshs.**	**M. Tons**	**Value '000 Kshs.**
Lake Victoria	92,727	13,976,586	98,150	14,487,650	90,743	11,640,537	88,223	12,687,298	94,349	14,082,375
Lake Turkana	4,021	486,540	7,587	564,739	7,031	645,107	13,190	1,177,193	15,644	1,478,953
Lake Naivasha	1,689	222,579	2,287	287,194	3,087	391,719	2,216	238,638	1,804	216,974
Lake Baringo	155	46,606	145	43,442	203	49,499	162	39,502	406	118,590
Lake Jipe	112	21,756	131	38,260	157	45,957	197	57,549	227	66,051
Lake Kanyaboli	127	26,346	203	29,656	300	43,826	264	60,201	286	70,074
Lake Kenyatta	45	3,473	14	1,330	32	2,725	72	7,295	68	6,816
Tana River Dams	422	84,500	297	37,373	394	60,571	283	50,960	197	28,563
Tana River Delta	115	9,296	46	5,069	202	17,595	158	20,360	135	13,048
Aquaculture	12,356	3,691,046	15,120	4,480,875	18,542	5,581,142	19,945	6,303,617	20,973	6,711,360
Turkwel	35	9,905	34	9,822	50	12,850	107	16,112	98	14,750
Riverine	10	2,368	320	86,400	380	106,371	411	115,049	393	109,454
Small Dams	300	75,120	339	42,015	459	126,455	358	95,022	380	83,465
Total Fresh Water	**112,114**	**18,656,121**	**124,673**	**20,113,825**	**121,580**	**18,724,354**	**125,586**	**20,868,796**	**136,326**	**23,335,961**
Marine (Artisanal)	23,286	4,375,822	23,145	4,246,962	25,670	4,477,577	23,684	4,831,948	25,380	5,491,800
Mariculture	51	1,530	64	1,920	76	1,895	85	2,119	103	2,568
Industrial (Marine)										
Shallow prawn trawl fishery	346	115,486	520	189,605	535	185,900	273	177,446	330	115,231
Deep water trawl fishery	41	9,102	10	42,341	626	170,089	943	518,385	1,026	350,933
Deep water crab pottery	-	-	1	251	38	19,072	86	71,295	137	119,680
Deep sea longlining	62	1,788	508	20,362	795	30,759	670	26,855	432.6	170,965
Total Industrial	**449**	**126,376**	**1,039**	**252,559**	**1,994**	**405,820**	**1,972**	**793,981**	**1,926**	**756,809**
Marine Aquarium		28,701		42,414		38,575		34,516		809,219
Total Marine	**23,786**	**4,532,429**	**24,248**	**4,543,855**	**27,740**	**4,923,867**	**25,741**	**5,662,564**	**27,409**	**7,060,396**
Grand Total	**135,900**	**23,188,550**	**148,921**	**24,657,680**	**149,320**	**23,648,221**	**151,327**	**26,531,360**	**163,735**	**30,396,357**
EXPORTS										
Fish and fish products	3,554	2,253,644	7,250	2,974,980	8,821	3,407,548	8,387	2,740,678	10,782	3,412,116
Aquarium fish (Numbers)	323,691	22,866	366,776	34,241	297,367	31,219	272,696	27,583	498,908	609,668
Aquarium invertebrates (Numbers)	176,130	5,835	191,672	8,173	133,844	7,356	124,856	6,933	350,309	199,551
TOTAL		**2,282,345**		**3,017,394**		**3,446,123**		**2,775,194**		**4,221,335**
Imports	19,127	1,568,565	26,383	2,974,678	22,813	2,798,951	19,892	2,251,861	19,601	2,478,751
Balance of Trade		**713,780**		**42,716**		**647,172**		**523,333**		**1,742,584**

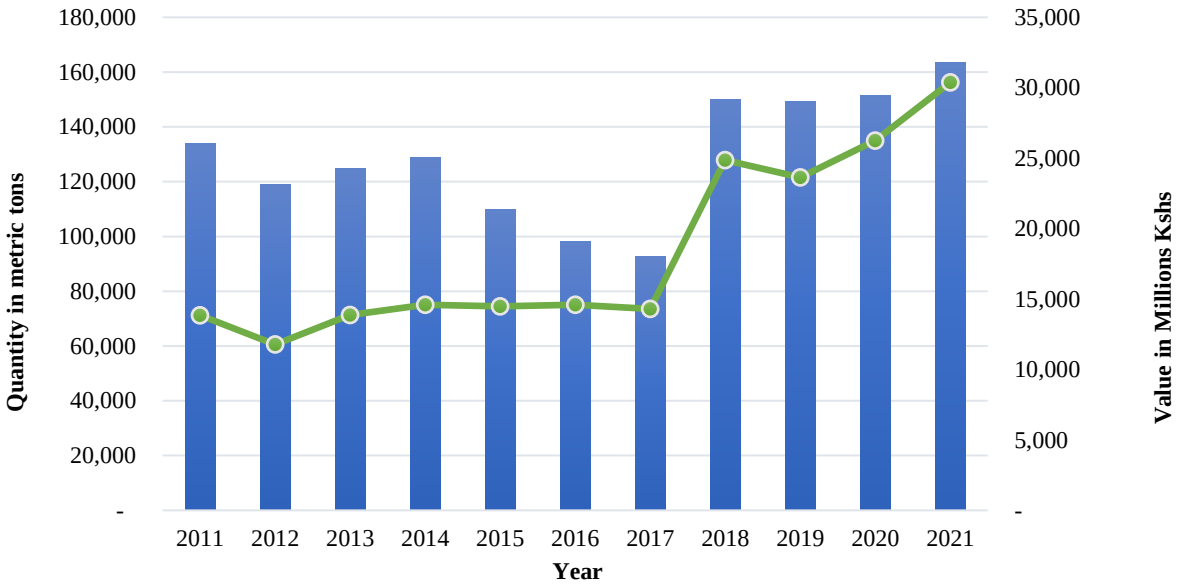

Figure 1. 2 Quantity and Value of fish landings 2011 – 2021

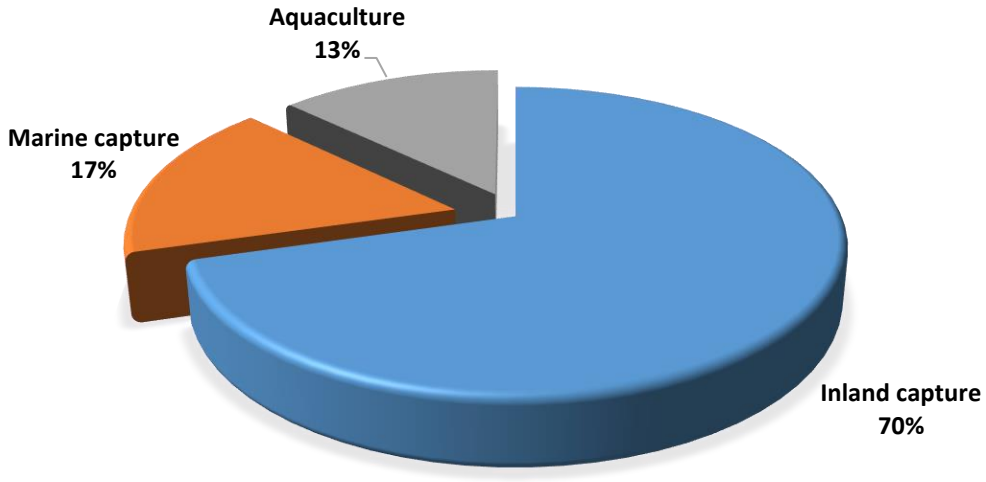

Figure 1. 3 Pie chart showing the proportions of the major types of Fishery in the country

1.1 LAKE VICTORIA FISHERY

Lake Victoria's Fishery accounted for 94,349 metric tons (Table 1.1) which was a 7% increase in catch compared to 88,223 MT recorded in the year 2020 last year. The increase was attributed to relaxed Covid-19 pandemic restriction and resumption of normal fishing hours.

Capture fisheries of Lake Victoria are a source of livelihood to many people employed directly as boat owners, fishermen, fish traders, fish processors, etc. and indirectly to fishing gear manufacturers, boat builders, and ice producers among others.

Lake Victoria is a multi-species fishery with many of known species, but only *Rastrineobola argentea* (Omena), *Lates niloticus* (Nile perch) and *Oreochromis niloticus* (Nile tilapia) are of major economic significance.

The catch from the major species was recorded as; *Rastrineobola argentea* at 51,305 MT, *Lates niloticus* at 12,349 MT and *Oreochromis niloticus* at 11,173 MT (Table 1.3)

Figure 1. 4 Trends in annual fish landings from Lake Victoria for the year 2017 - 2021

In terms of species contribution to the total catch of fish landed from Lake Victoria, *Rastrineobola argentea* took the lead with 54%, *Lates Niloticus* 13%, *Tilapia niloticus* 12%, *Caridina niloticus* and *Momyrus* at 6%, *black bass* 5% while *Clarias* 1%, (Figure 1.5).

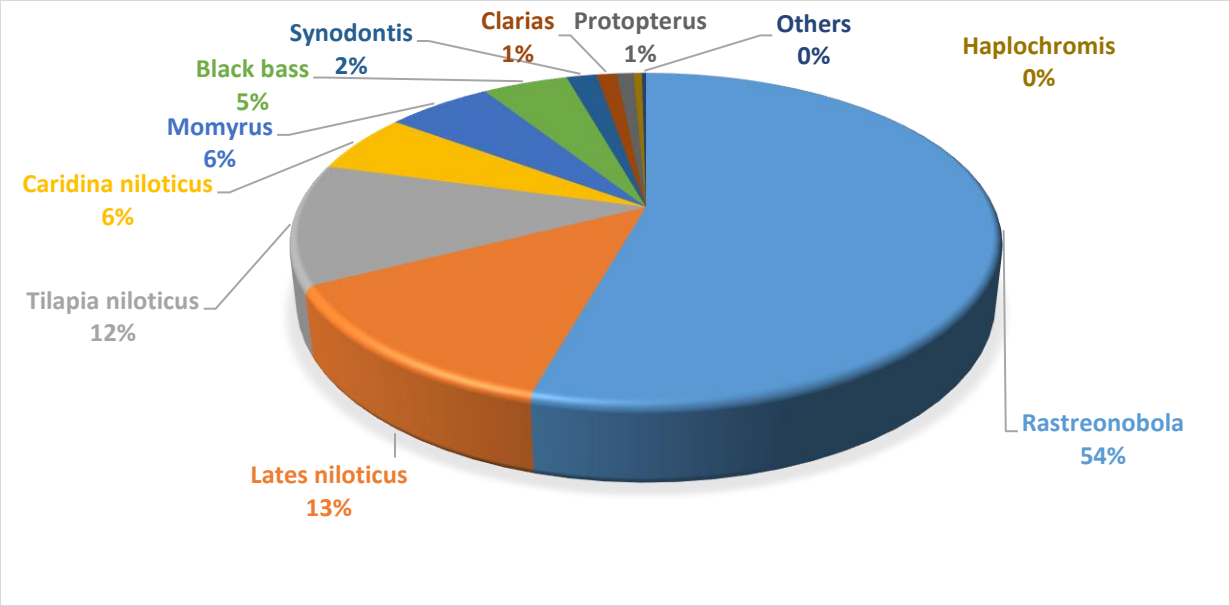

Figure 1. 5 Lake Victoria fish landings by species 2021

Analysis was done to compare the fish catch from Lake Victoria per riparian county (Table 1.2). Homa Bay County recorded the highest catch at 57%, Siaya 32%, Kisumu 4%, Busia 4% while Migori recorded the lowest catch at 3% (Figure 1.6).

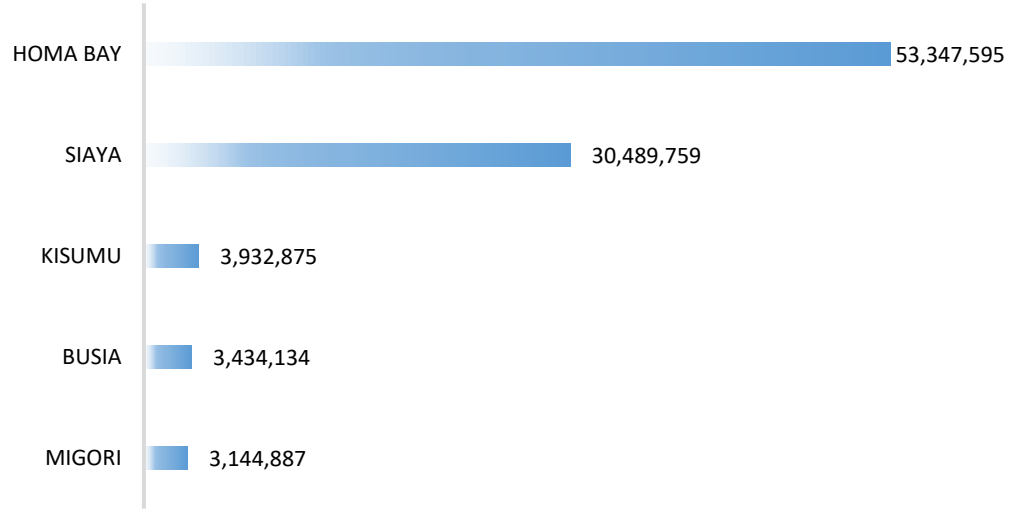

Figure 1. 6 Fish weight caught per riparian county during 2021

Table 1. 2 Lake Victoria Annual fish landings by Species, Weight, Value and by Counties 2021

SPECIES	SIAYA		KISUMU		HOMA BAY		MIGORI		BUSIA		TOTAL	
	Wt (Kg)	Value (Ksh)	Wt (Kg)	Value (Ksh)	Wt (Kg)	Value (Ksh)	Wt (Kg)	Value (Ksh)	Wt (Kg)	Value (Ksh)	Wt (Kg)	Value (Ksh)
Alestes	457	52,095.01	15,357	1,889,878.69	0	0	0	0	0	0	15,814	1,941,974
Bagrus	9,575	618,395	0	0	6,391	306,990	0	0	0	0	15,966	925,385
Barbus	1,309	110,125	0	0	38,660	6,572,200	537	83,455	0	0	40,506	6,765,780
Black bass	0	0	0	0	4,423,768	552,971,000	0	0	0	0	4,423,768	552,971,000
Clarias	468,712	86,711,720	578,894	109,989,860	0	0	3,560	676,400	1,377	262,063	1,052,543	197,640,043
Rastreonobola	9,748,024	965,054,376	256,527	25,396,173	37,452,933	3,670,387,434	769,581	73,110,195	3,078,323	292,440,685	51,305,388	5,026,388,863
Labeo	15499	1,766,886	14,280	1,627,920	33,734	3,845,676	0	0	7925	903,450	71,438	8,143,932
Haplochromis	176,934	25,351,916	137,974	21,376,077	103	3,080	58,211	2,695,032	54,417	5,177,273	427,639	54,603,378
Lates niloticus	8,434,382	2,151,767,410	500,069	151,320,700	1,491,020	365,299,900	1,686,372	421,593,000	237,439	71,231,700	12,349,282	3,161,212,710
Momyrus	297	23,623	0	0	5,483,561	822,534,150	0	0	0	0	5,483,858	822,557,773
Protopterus	339,751	57,757,670	496,589	89,386,020	31,254	5,938,260	5,242	891,140	3,115	591,850	875,951	154,564,940
Synodontis	91,338	8,288,263	426,875	90,662,693	1,008,995	80,224,596	23,346	2,798,566	2,354	224,002	1,552,908	182,198,120
Tilapia niloticus	4,594,945	1,102,786,800	397,852	99,463,000	5,811,934	1,394,864,160	170,097	40,823,280	197,733	51,410,580	11,172,561	2,689,347,820
Unspecified	0	0	0	0	0	0	0	0	18,308	3,844,680	18,308	3,844,680
Caridina niloticus	5,495,709	1,209,055,980.00	0	0	0	0	0	0	0	0	5,495,709	1,209,055,980
Schilbe mystes	0	0	46,806	10,297,320	0	0	0	0	805	185,150	47,611	10,482,470
TOTAL	**30,489,759**	**5,506,306,131**	**3,932,875**	**793,873,391**	**53,347,595**	**6,906,191,134**	**3,144,887**	**610,884,271**	**3,434,134**	**265,120,823**	**94,349,250**	**14,082,644,848**

Table 1. 3 Lake Victoria Monthly fish landings by Species and Weight (MT) in 2021

SPECIES	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
	Wt (Kg)	Wt (Kg)	Wt (Kg)	Wt (Kg)	Wt (Kg)	Wt (Kg)	Wt (Kg)	Wt (Kg)	Wt (Kg)	Wt (Kg)	Wt (Kg)	Wt (Kg)	Wt (Kg)
Alestes	272	464	847	4,640	482	562	499	1,868	1,207	1,242	1,761	1,971	**15,814**
Bagrus	3,312	313	1,796	2,572	897	804	906	913	1,034	1,272	1,138	1,008	**15,966**
Barbus	8,186	1,350	2,405	165	1,765	2,678	6,142	1,035	1,919	13,815	970	75	**40,506**
Black bass	24,450	45,390	33,330	34,567	65,433	332,660	567,350	456,350	896,630	912,045	211,883	843,680	**4,423,768**
Clarias	81,865	67,184	66,218	102,006	197,079	80,519	66,041	83,526	88,257	65,777	78,684	75,387	**1,052,543**
Rastreonobola	2,911,383	7,836,748	6,263,109	5,441,629	3,736,091	4,967,396	3,751,170	2,969,275	4,498,650	4,141,250	2,483,373	2,305,314	**51,305,388**
Labeo	9,442	4,577	8,316	1,709	3,988	6,864	9,589	2,348	6,087	4,741	8,339	5,438	**71,439**
Haplochromis	33,611	36,422	27,056	42,391	30,474	37,379	39,636	78,905	26,409	20,284	28,950	26,124	**427,640**
Lates niloticus	1,230,946	910,978	935,544	1,080,958	1,322,477	1,167,808	986,166	1,261,082	818,395	1,159,504	754,217	721,206	**12,349,282**
Momyrus	409,687	594,198	622,821	671,965	488,954	268,816	250,869	333,397	424,298	403,364	417,198	598,290	**5,483,857**
Protopterus	59,411	80,670	49,381	70,163	74,447	111,284	81,173	80,844	90,794	60,872	63,342	53,570	**875,951**
Synodontis	58,365	35,655	56,785	58,692	153,478	70,613	78,427	148,589	230,600	386,259	159,368	116,077	**1,552,908**
Tilapia niloticus	675,790	457,458	449,284	572,171	1,787,681	457,612	628,124	612,860	3,449,862	545,581	753,170	782,967	**11,172,561**
Unspecified	1,325	805	681	1,647	1,461	1,660	1,759	1,598	1,601	1,891	1,900	1,979	**18,308**
Caridina niloticus	601,273	427,898	398,695	409,554	399,721	432,898	402,763	523,508	534,590	540,060	349,829	474,919	**5,495,709**
Schilbe mystes	3,026	4,783	5,294	5,709	4,868	5,984	5,432	2,206	3,821	2,046	2,216	2,228	**47,611**
TOTAL	**6,112,344**	**10,504,894**	**8,921,562**	**8,500,538**	**8,269,298**	**7,945,536**	**6,876,044**	**6,558,304**	**11,074,156**	**8,260,003**	**5,316,337**	**6,010,233**	**94,349,250**

1.2 LAKE TURKANA FISHERY

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 an increase in fish catches especially tilapias.

During the year under review, 15,644 MT of fish landed with an ex-vessel value of 1.478 billion Kshs. from both sides (Turkana and Marsabit counties) of the lake (Table 1.3). The production in 2021 was an increase of 14.6% in quantity and a 47.7% increase in value compared to 2020 production of 13,664 MT with an ex-vessel value of Kshs.1.001 billion (Figure 1.6). The trends in annual fish catches from Lake Turkana are determined by the lakes' water level and as a result, the catches have been unpredictable for a long time.

Table 1. 3 Lake Turkana Annual fish landings by Species, Weight, Value (Ksh) in 2021

MONTH	Species	Alestes	Labeo	Nile perch	Others	Tilapia	TOTALS
JAN	W (Kgs)	190,595	52,048	10,185	38,340	1,624,671	**1,915,840**
	V (Ksh)	9,027,954	5,404,556	1,101,617	2,195,102	49,428,079	**67,157,308**
FEB	W (Kgs)	62,227	55,516	4,736	44,326	1,160,194	**1,327,000**
	V (Ksh)	3,564,601	6,248,655	1,257,106	1,785,107	41,036,735	**53,892,204**
MAR	W (Kgs)	92,051	26,689	2,289	1,786	178,322	**301,136**
	V (Ksh)	10,596,976	4,796,417	771,169	292,780	26,312,980	**42,770,322**
APR	W (Kgs)	107,276	47,046	3,620	3,656	1,877,846	**2,039,443**
	V (Ksh)	10,999,857	6,743,934	1,067,642	349,341	160,682,278	**179,843,052**
MAY	W (Kgs)	57,636	54,799	6,250	2,607	2,537,737	**2,659,030**
	V (Ksh)	5,383,277	7,466,334	1,625,046	363,035	326,247,581	**341,085,272**
JUN	W (Kgs)	41,440	74,469	8,117	34,600	1,344,719	**1,503,345**
	V (Ksh)	3,973,133	8,355,356	2,372,284	4,435,170	105,693,703	**124,829,645**
JUL	W (Kgs)	55,365	27,045	33,596	9,959	960,144	**1,086,109**
	V (Ksh)	5,892,199	4,737,078	7,934,892	1,257,564	111,222,779	**131,044,513**
AUG	W (Kgs)	74,271	48,300	35,824	15,429	1,254,137	**1,427,960**
	V (Ksh)	6,979,369	5,613,141	8,473,226	1,758,692	140,969,799	**163,794,227**
SEPT	W (Kgs)	44,452	24,339	37,938	17,764	557,888	**682,382**
	V (Ksh)	4,707,165	3,415,035	8,924,035	3,207,533	63,773,581	**84,027,350**
OCT	W (Kgs)	62,369	45,147	26,696	15,982	644,322	**794,515**
	V (Ksh)	6,512,643	5,270,212	6,282,695	2,516,022	74,253,251	**94,834,823**
NOV	W (Kgs)	74,677	60,446	15,426	14,198	742,928	**907,675**
	V (Ksh)	7,594,177	6,140,146	3,609,891	1,824,511	86,968,445	**106,137,171**
DEC	W (Kgs)	44,223	46,309	26,367	16,697	865,974	**999,570**

	V (Ksh)	4,181,379	7,841,363	6,059,846	2,120,452	69,334,073	**89,537,113**
TOTALS	**W (Kgs)**	906,581	562,152	211,044	215,343	13,748,884	**15,644,005**
	V (Ksh)	79,412,731	72,032,228	49,479,449	22,105,310	1,255,923,282	**1,478,953,000**

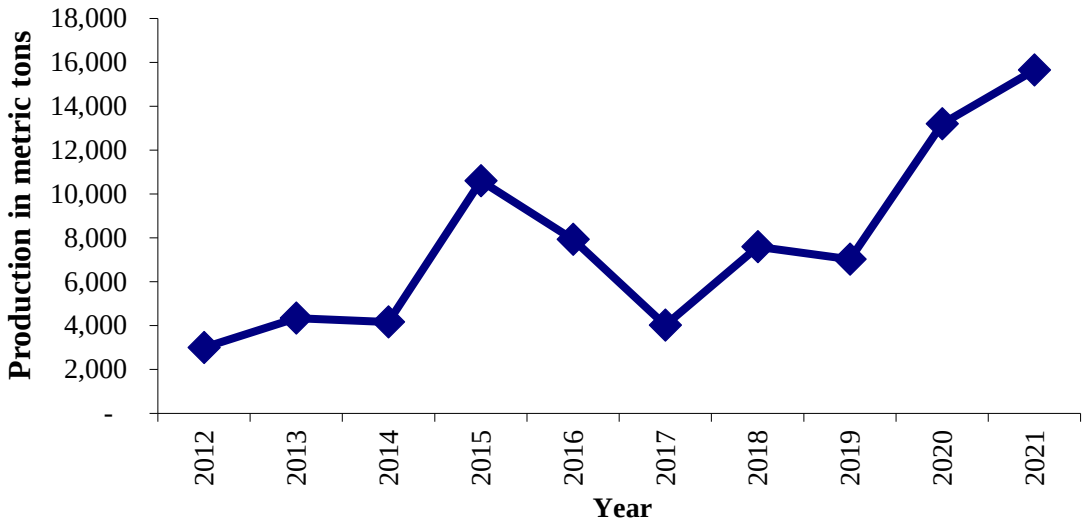

Figure 1. 7 Trends in annual fish landings from Lake Turkana fishery 2012-2021(would be useful to have a paragraph above introducing the figure)

1.2.1 SPECIES COMPOSITION

In terms of species contribution to the total weight of fish landed from the lake, *Tilapia niloticus* took the lead with 88%, Alestes 6%, labeo 4% and *Lates niloticus* 1%, while all other species accounted for 1% of the 2021 catch (Figure 1.8).

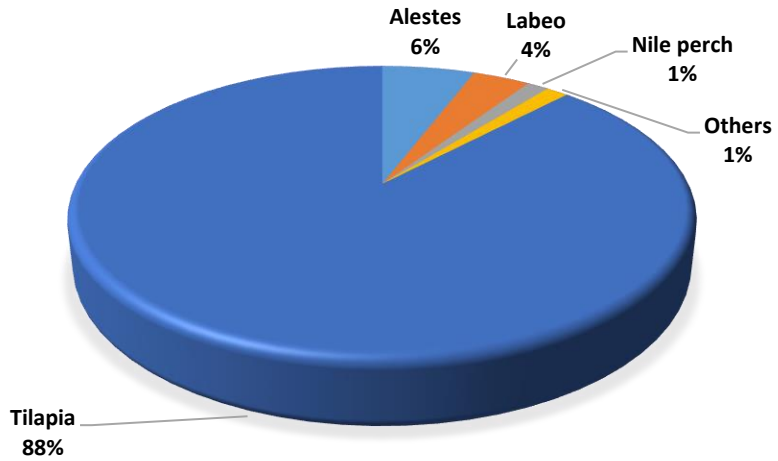

Figure 1. 8 Species composition (Kgs) in catches of Lake Turkana Fishery 2021

1.3 LAKE BARINGO FISHERIES

The fishery of Lake Baringo in 2021 was based on four species including *Oreochromis niloticus* (Tilapia), *Barbus gregorii*, *Clarias mossambicus* and *Protopterus aethiopicus* which was introduced in the lake.

During the year under review a total of 406 MT of fish with an ex-vessel value of Kshs.118,590 million were landed (Table 1.4). This was a 150% increase in quantity and 203% increase in value compared to last year's production of 162 MT with an ex-vessel value of Ksh. 39,138 million (Figure 1.9). this can be attributed to fill up of lake breeding areas due to floodings experienced in the area.

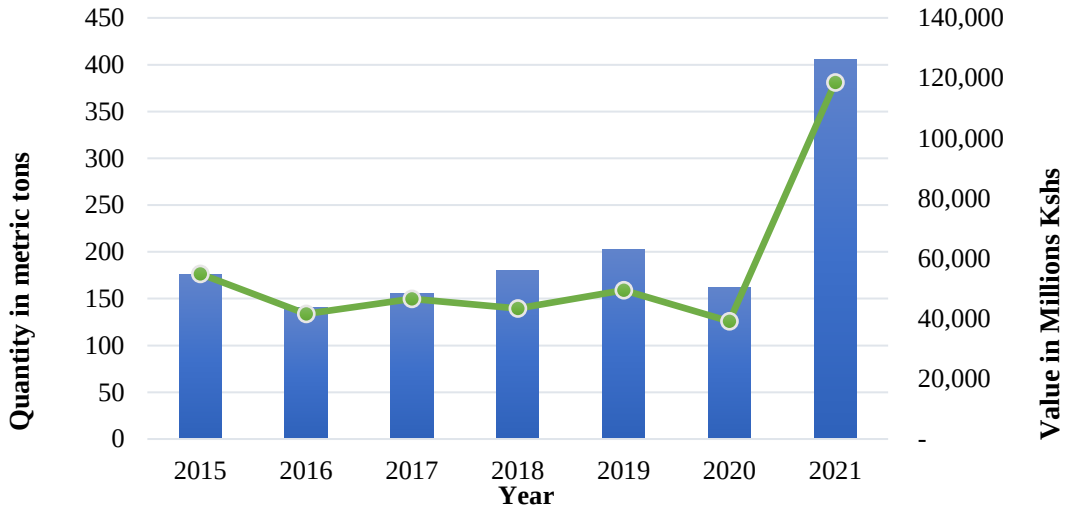

Figure 1. 9 Trends in annual fish landings from Lake Baringo fishery 2015-2021

The species catch composition was dominated by *Proptopterus aethiopicus* contributing 66% followed by *Tilapia niloticus* 24 %, *Clarias with* 7 % and *Barbus 3*% (Figure 1.10).

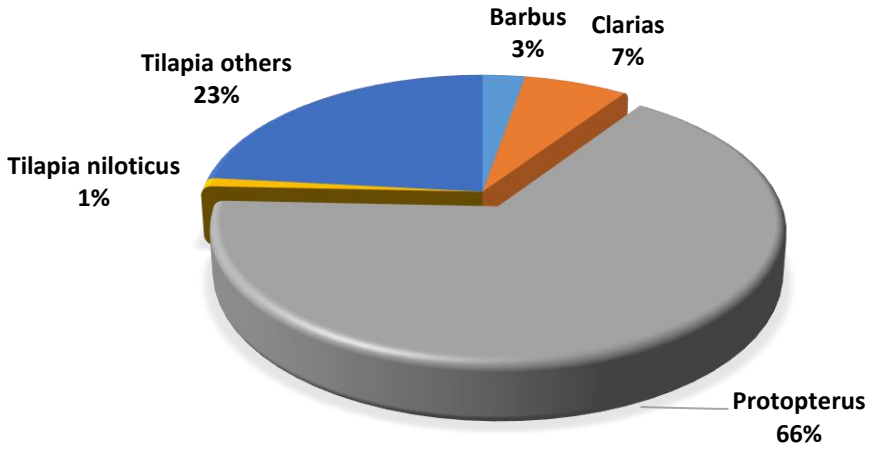

Figure 1. 10 Species composition in catches of Lake Baringo Fishery 2021

Table 1. 4 Lake Baringo Monthly fish landings by Species, Weight and Value in 2021

		SPECIES					
		Barbus	**Clarias**	**Protopterus**	**Tilapia niloticus**	**Tilapia others**	**TOTAL**
Jan	Wt (Kg)	460	2,871	14,303	438	7,436	25,508
	Value (Ksh)	86,000	1,310,500	2,860,600	144,000	2,230,800	6,631,900
Feb	Wt (Kg)	274	2,491	120,902	477	5,920	130,064
	Value (Ksh)	54,800	1,185,500	24,180,400	130,400	1,776,000	27,327,100

Mar	Wt (Kg)	174	2,264	9,120	323	7,560	19,441
	Value (Ksh)	34,800	1,113,850	1,824,000	98,950	2,268,000	5,339,600
Apr	Wt (Kg)	1,307	724	7,510	130	8,078	17,749
	Value (Ksh)	261,400	362,500	1,422,000	39,000	2,423,400	4,508,300
May	Wt (Kg)	453	2,202	12,063	122	5,213	20,053
	Value (Ksh)	90,600	1,000,450	2,412,600	30,500	1,563,900	5,098,050
Jun	Wt (Kg)	442	1,957	17,909	368	17,909	38,585
	Value (Ksh)	88,400	947,250	3,581,800	124,050	5,372,700	10,114,200
Jul	Wt (Kg)	715	2,803	16,749	228	8,308	28,803
	Value (Ksh)	143,000	1,276,000	3,349,800	68,400	2,492,400	7,329,600
Aug	Wt (Kg)	1,414	3,607	17,325	591	9,802	32,739
	Value (Ksh)	282,800	1,773,200	3,465,000	173,250	2,940,600	8,634,850
Sep	Wt (Kg)	440	1,367	12,999	347	6,440	21,593
	Value (Ksh)	88,000	633,600	2,599,800	88,750	1,932,000	5,342,150
Oct	Wt (Kg)	2,688	1,953	11,654	130	7,934	24,359
	Value (Ksh)	537,600	958,300	2,330,800	39,000	2,380,200	6,245,900
Nov	Wt (Kg)	1,406	2,391	12,857	417	6,692	23,763
	Value (Ksh)	281,200	1,097,000	2,571,400	93,950	2,007,600	6,051,150
Dec	Wt (Kg)	1,454	2,855	15,116	880	3,238	23,543
	Value (Ksh)	290,800	1,195,680	3,023,200	267,200	971,400	5,748,280
TOTAL	**Wt (Kg)**	**11,227**	**27,354**	**268,505**	**4,141**	**94,530**	**405,757**
	Value (Ksh)	**22,445,400**	**12,796,380**	**53,701,000**	**1,289,200**	**28,359,000**	**118,590,980**

1.4 LAKE NAIVASHA FISHERY

The fish population of Lake Naivasha in 2021 comprised of introduced species including largemouth bass (*Micropterus salmoides*), *Tilapia zilli*, *Oreochromis leucostictus* and other tilapine species. The exotic rainbow trout (*Onchorhynchus mykiss*) occasionally strays into the lake from river Malewa while *Barbus amphigramma* migrates between the lake and river Malewa.

During the year under review, a total of 1,804 tons of fish with an ex-vessel value of Ksh. 216 million were landed from Lake Naivasha (Table 1.5). This was an 18% decline in quantity and a 10% decline in value compared to 2020 landings of 2,216 tons valued at Ksh. 239 million (Figure 1.11).

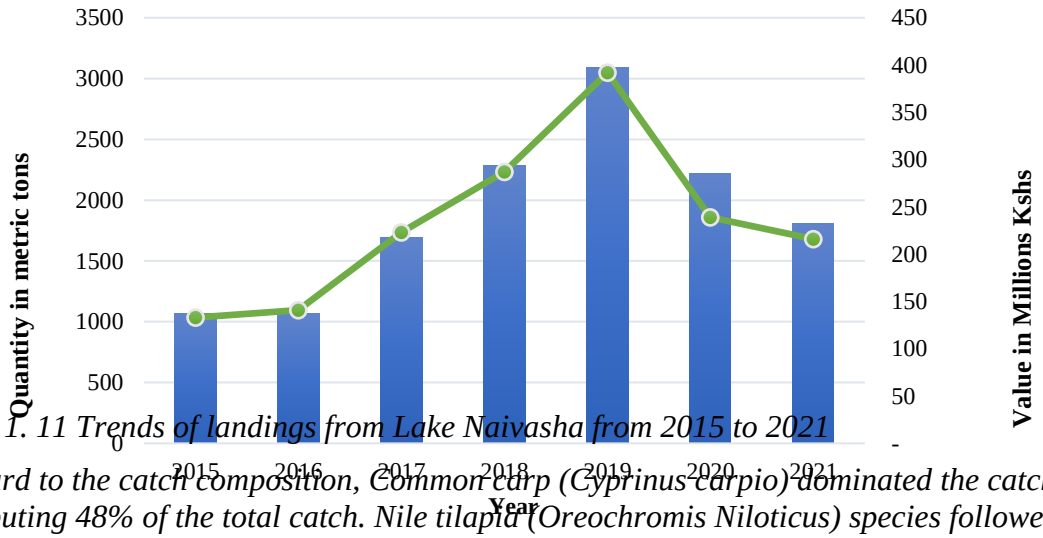

Figure 1. 11 Trends of landings from Lake Naivasha from 2015 to 2021

In regard to the catch composition, Common carp (Cyprinus carpio) dominated the catch contributing 48% of the total catch. Nile tilapia (Oreochromis Niloticus) species followed, accounting for 46% and Clarias gariepinus 5% of the total catch (Fig 1.13). The monthly fish catches peaked in September 2021 (Fig. 1.12).

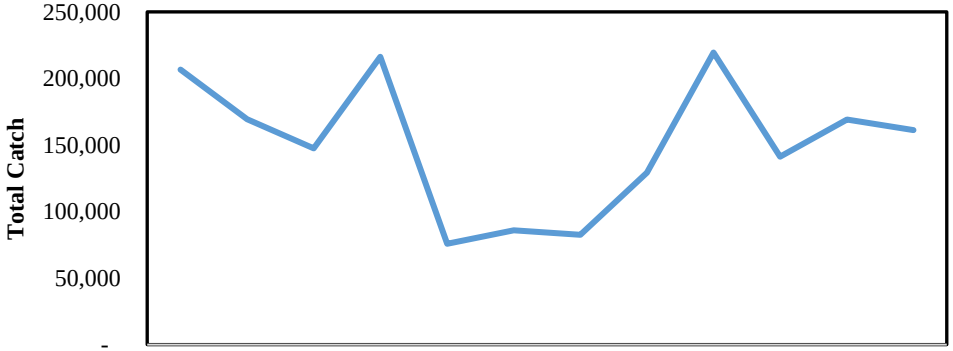

Figure 1. 12 Lake Naivasha monthly catches in Kgs 2021

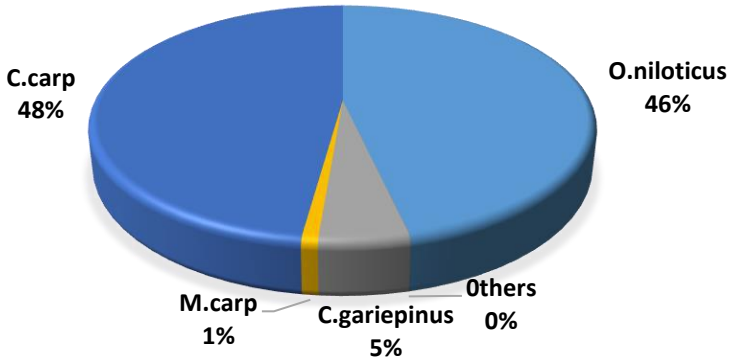

Figure 1. 13 Lake Naivasha species composition landings in metric tonnes 2021

Species composition in the catches from the lake has changed over the year with the restocking of the lake with tilapia. Tilapia species have now regained its prominence in the landings almost being at same proportion with *Cyprinus carpio* which had previous dominated the fishery.

Table 1. 5 Lake Naivasha Monthly fish landings by Species, Weight and Value 2021

		SPECIES						
Months		**O. leucosticus**	**O.niloticus**	**M.salmonoid**	**C.gariepinus**	**M.carp**	**C.carp**	**Total**
JANUARY	KGS	-	180,530	9	8,820	353	16,811	**206,523**
	VALUE	-	20,515,280	1,000	399,381	28,450	1,012,599	**21,956,710**
FEBRUARY	KGS	-	141,823	16	3,048	277	24,222	**169,386**
	VALUE	-	21,998,786	2,100	195,216	38,000	1,939,773	**24,173,875**
MARCH	KGS	-	101,389	2	4,361	879	40,838	**147,469**
	VALUE	-	30,003,241	200	263,440	86,947	3,304,805	**33,658,633**
APRIL	KGS	-	167,035	10	6,068	755	42,481	**216,349**
	VALUE	-	27,067,833	1,800	437,121	50,519	3,370,680	**30,927,953**
MAY	KGS	-	40,793	25	4,680	568	29,708	**75,774**
	VALUE	-	5,939,634	3,322	370,440	40,800	2,159,555	**8,513,751**
JUNE	KGS	2	34,990	20	9,670	848	40,364	**85,894**
	VALUE	210	6,325,235	2,100	395,016	71,010	3,681,550	**10,475,121**
JULY	KGS	3	22,450	23	4,727	1,232	54,189	**82,624**
	VALUE	210	3,818,011	3,000	340,415	99,850	5,016,834	**9,278,320**

AUGUST	KGS	11	21,016	42	5,495	1,977	100,692	**129,233**
	VALUE	1,160	3,554,016	5,400	390,058	184,005	8,516,093	**12,650,732**
SEPTEMBER	KGS	2	28,702	34	7,925	2,298	180,488	**219,449**
	VALUE	100	4,928,216	2,630	558,818	257,287	11,859,813	**17,606,864**
OCTOBER	KGS	-	16,978	25	11,064	2,390	110,862	**141,319**
	VALUE	-	1,926,400	3,900	887,205	257,970	9,911,660	**12,987,135**
NOVEMBER	KGS	-	23,274	33	11,084	2,642	132,058	**169,091**
	VALUE	-	2,133,991	3,500	777,105	246,035	11,085,253	**14,245,884**
DECEMBER	KGS	-	58,464	-	11,007	1,849	89,764	**161,084**
	VALUE	-	7,079,346	-	816,211	166,285	12,437,524	**20,499,366**
TOTAL	**KGS**	**18**	**837,444**	**239**	**87,949**	**16,068**	**862,477**	**1,804,194**
	VALUE	**1,680**	**135,289,989**	**28,952**	**5,830,426**	**1,527,158**	**74,296,139**	**216,974,344**

1.5 LAKE JIPE AND CHALLA FISHERY

Lake Jipe watershed is an important transboundary wetland ecosystem between Kenya and Tanzania. The lake is fed by river Limu which originates from Mt Kilimanjaro slopes and River Muvulani from Pare Mountains. The lake outflows into River Ruvu. Lake Jipe is experiencing severe catchment degradation mainly due to anthropogenic activities that lead to eutrophication, siltation and pollution.

During the year 2021, a total of 228 metric tons of both Tilapia and Clarias with an ex-vessel value of Kshs 66 million were landed from Lake Jipe (218 MT) and Lake Challa (9.97 MT) (Table 1.6).

There were only two species caught in lake Jipe. The species comprised of Tilapia (85%) and Clarias (15%). Lake Challa comprised totally of tilapia (Table 1.6).

Table 1. 6 Lake Jipe and Challa Monthly fish landings by Species, Weight and Value in 2021

Month	**Species**	**Clarias (Jipe)**	**Tilapia niloticus (Jipe)**	**Tilapia (Challa)**	**Total**
Jan	Wt (Kg)	2,970	14,975	323	**18,268**
	Value (Ksh)	742,500	4,492,500	96,900	**5,331,900**
Feb	Wt (Kg)	3,050	14,974	430	**18,454**
	Value (Ksh)	762,500	4,492,200	129,000	**5,383,700**
Mar	Wt (Kg)	2,953	14,653	158	**17,764**
	Value (Ksh)	738,250	4,395,900	47,400	**5,181,550**
Apr	Wt (Kg)	2,786	14,941	560	**18,287**
	Value (Ksh)	696,500	4,482,300	168,000	**5,346,800**
May	Wt (Kg)	2,597	15,288	349	**18,234**
	Value (Ksh)	649,250	4,586,400	104,700	**5,340,350**
Jun	Wt (Kg)	2,713	15,070	680	**18,463**
	Value (Ksh)	678,250	4,521,000	204,000	**5,403,250**
Jul	Wt (Kg)	2,557	15,350	498	**18,405**
	Value (Ksh)	639,250	4,605,000	149,400	**5,393,650**

Aug	Wt (Kg)	2,455	15,753	680	**18,888**
	Value (Ksh)	613,750	4,725,900	204,000	**5,543,650**
Sep	Wt (Kg)	2,415	15,917	779	**19,111**
	Value (Ksh)	603,750	4,775,100	233,700	**5,612,550**
Oct	Wt (Kg)	2,528	16,171	1,905	**20,604**
	Value (Ksh)	632,000	4,851,300	571,500	**6,054,800**
Nov	Wt (Kg)	2,765	16,163	2,049	**20,977**
	Value (Ksh)	691,250	4,848,900	614,700	**6,154,850**
Dec	Wt (Kg)	2,893	16,394	1,560	**20,847**
	Value (Ksh)	723,250	4,918,200	468,000	**6,109,450**
TOTAL	**Wt (Kg)**	**32,664**	**185,649**	**9,971**	**228,284**
	Value (Ksh)	**8,166,000**	**55,694,700**	**2,991,300**	**66,852,000**

1.6 TURKWEL DAM

Turkwel Dam is one of the major hydro-electric power stations in Kenya. It is situated in the Northwest of Kenya, in the border of Turkana and the West Pokot 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.

During 2021 a total of 98 MT of fish with an ex-vessel value of Ksh 14.8 million was landed from the dam. The fisheries of the dam comprised of two species: Tilapia *(Oreochromis niloticus)* and *Clarias spp*. Tilapia landings contributed 91% (89.9MT) while Clarias contributed 9% (8.4 MT) during the review period (Figure 1.14).

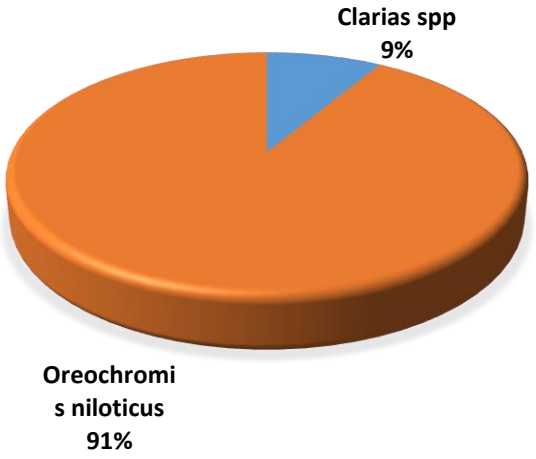

Figure 1. 14 Percentages composition of species catch in Turkwel dam 2021

Data analysed for the monthly catches showed that the Oreochromis Niloticus had more catch compared to Clarias. The highest catch for Oreochromis Niloticus was witnessed in September while for Clarias was in August (Table 1.7).

Table 1. 7 Turkwel dam Monthly fish landings by Species 2021

		SPECIES		
MONTH		**Clarias spp**	**Oreochromis niloticus**	**TOTAL**
JANUARY	Kgs	882	8,100	**8,982**
	Kshs	132,300	1,215,000	**1,347,300**
FEBRUARY	Kgs	729	8,115	**8,844**
	Kshs	109,350	1,217,250	**1,326,600**
MARCH	Kgs	604	8,000	**8,604**
	Kshs	90,600	1,200,000	**1,290,600**
APRIL	Kgs	528	8213	**8,741**
	Kshs	82,200	1,231,950	**1,314,150**
MAY	Kgs	618	8101	**8,719**
	Kshs	92,700	1,215,150	**1,307,850**
JUNE	Kgs	799	7918	**8,717**
	Kshs	119,850	1,187,700	**1,307,550**
JULY	Kgs	862	8056	**8,918**
	Kshs	129,300	1,208,400	**1,337,700**
AUGUST	Kgs	966	8801	**9,767**
	Kshs	144,900	1,320,150	**1,465,050**
SEPTEMBER	Kgs	1049	8517	**9,566**
	Kshs	157,350	1,277,550	**1,434,900**
OCTOBER	Kgs	715	8200	**8,915**
	Kshs	107,250	1,230,010	**1,337,260**
NOVEMBER	Kgs	687	7859	**8,546**
	Kshs	103,050	1,178,870	**1,281,920**
DECEMBER	Kgs	0	0	**0**
	Kshs	-	-	**0**
Total	**Kgs**	**8,439**	**89,880**	**98,319**
	Kshs	**1,268,850**	**13,482,030**	**14,750,880**

1.7 RIVERINE

During the year 2021, fish landings from Riverine fishery amounted to 393 tons with an ex-vessel value of Ksh 109 million. The riverine fishery consisted of both permanent and seasonal river network in the country.

Clarias and tilapia were the most landed species from the riverine fishery contributing 95% of the total catch (Table 1.8).

Table 1. 8 Riverine fish catch weight and value by species in Kgs in 2021

RIVERS	Units	*Clarias spp.*	*Oreochromis niloticus*	Trout	Carps	Others	Totals
R. MATHIOYA	Kgs	-	-	22	-	-	22
	Kshs	-	-	8,733	-	-	8,733
R. MERT & GARB(KERIO)	Kgs	1,487	-	-	-	-	1,487
	Kshs	433,740	-	-	-	-	433,740
R. EWASO NYIRO	Kgs	1,130	1,502	332	-	-	2,964
	Kshs	681,808	606,574	300,768	-	-	1,589,149
R. TANA.	Kgs	8,750	28,431	1,614	1,288	541	40,621
	Kshs	2,640,913	8,581,707	1,136,738	388,933	272,051	13,020,342
ATHI RIVER	Kgs	41,637	127,978	-	5,800	-	175,415
	Kshs	8,378,844	38,630,278	-	1,283,847	-	48,292,970
RIVER NZOIA	Kgs	14,144	43,472	-	1,969	-	59,584
	Kshs	3,557,659	13,121,941	-	455,770	-	17,135,370
SONDU/KUJA	Kgs	3,709	11,398	-	516	-	15,622
	Kshs	932,867	3,440,441	-	129,729	-	4,503,037
TURKWEL	Kgs	4,874	14,978	-	-	679	20,531
	Kshs	1,225,910	4,521,090	-	-	-	5,747,000
NYANDO	Kgs	6,042	18,570	-	841	-	25,453
	Kshs	1,519,793	5,605,259	-	211,595	-	7,336,647
YALA	Kgs	2,413	7,420	-	338	-	10,171
	Kshs	607,917	2,241,904	-	84,806	-	2,934,628
KERIO	Kgs	3,329	10,228	-	-	4,640	18,196
	Kshs	837,141	-	-	-	933,707	1,770,848
OTHERS	Kgs	5,503	16,914	-	766	-	23,183
	Kshs	1,384,187	5,105,496	-	192,703	-	6,682,386
TOTAL	**Kgs**	**93,016**	**280,892**	**1,968**	**11,517**	**5,860**	**393,250**
	Kshs	**22,200,780**	**81,854,692**	**1,446,238**	**2,747,383**	**1,205,758**	**109,454,850**

1.8 TANA RIVER DELTA

Fresh water fish landings from Tana River delta in Tana River County during the year under review amounted to 50 MT with an ex-vessel value of Kshs.4.54 million (Table 1.9). This was a 20% decline in quantity and a 58% decrease in ex-vessel value compared to 63 MT with an ex-vessel value of Kshs.10.98 million landed in 2020 (Figure 1.15).

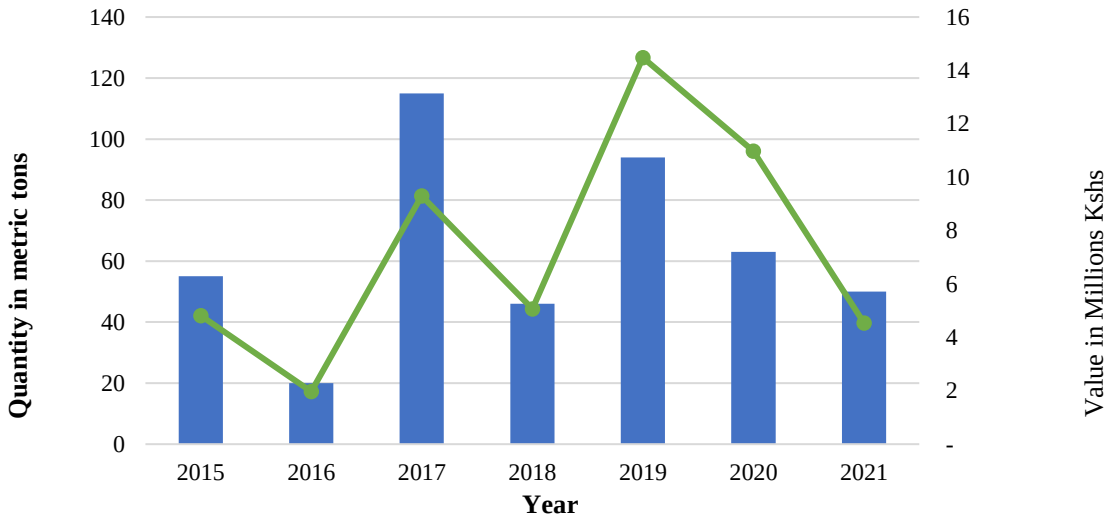

Figure 1. 15 Trends in annual fish landings from Tana River Delta fishery 2015-2021

Catch composition was analyzed and compiled monthly. The species Clarias was the most landed fish with a total weight of 8,410 Kgs. Tilapia Niloticus was the least caught species with a total weight of 5,170 kgs (Table 1.9).

Table 1. 9 Tana River Delta catch weight and value by species in Kgs 2021

Month	Species	Alestes	Clarias	Labeo	Protopterus	Synodontis	Tilapia niloticus	Tilapia others	Unspecified	Total
Jan	**Wt (Kg)**	490	560	330	450	460	320	380	500	**3,490**
	Value (Ksh)	34,300	56,000	23,100	40,000	36,800	38,400	38,000	50,000	**316,600**
Feb	**Wt (Kg)**	430	550	280	500	400	310	420	525	**3,415**
	Value (Ksh)	30,100	55,000	19,600	40,000	32,000	37,200	42,000	52,500	**308,400**
Mar	**Wt (Kg)**	480	540	250	550	530	250	415	514	**3,529**
	Value (Ksh)	33,600	54,000	17,500	44,000	42,400	30,000	41,500	51,400	**314,400**
Apr	**Wt (Kg)**	750	600	300	600	570	380	440	530	**4,170**
	Value (Ksh)	52,500	60,000	21,000	48,000	45,600	45,600	44,000	53,000	**369,700**
May	**Wt (Kg)**	720	670	350	630	600	420	560	550	**4,500**
	Value (Ksh)	50,400	67,000	24,500	50,400	48,000	50,400	56,000	55,000	**401,700**
Jun	**Wt (Kg)**	790	800	380	830	650	550	510	580	**5,090**
	Value (Ksh)	55,300	80,000	26,600	66,400	52,000	66,000	51,000	58,000	**455,300**
Jul	**Wt (Kg)**	720	950	400	750	630	530	430	610	**5,020**
	Value (Ksh)	50,400	95,000	28,000	60,000	50,400	63,600	43,000	61,000	**451,400**

Aug	**Wt (Kg)**	560	800	390	740	580	560	390	620	**4,640**
	Value (Ksh)	30,200	80,000	27,300	59,200	46,400	67,200	39,000	62,000	**411,300**
Sep	**Wt (Kg)**	580	780	320	700	500	620	450	650	**4,600**
	Value (Ksh)	40,600	78,000	22,400	56,000	40,000	74,400	45,000	65,000	**421,400**
Oct	**Wt (Kg)**	530	800	290	650	530	450	400	600	**4,250**
	Value (Ksh)	37,100	80,000	20,300	52,000	42,400	54,000	40,000	60,000	**385,800**
Nov	**Wt (Kg)**	480	670	315	530	490	400	410	550	**3,845**
	Value (Ksh)	33,600	67,000	22,050	42,400	39,200	48,000	41,000	55,000	**348,250**
Dec	**Wt (Kg)**	520	690	325	550	510	380	400	530	**3,905**
	Value (Ksh)	36,400	69,000	22,750	44,000	40,800	45,600	40,000	53,000	**351,550**
TOTAL	**Wt (Kg)**	7,050	8,410	3,930	7,480	6,450	5,170	5,205	6,759	**50,454**
	Value (Ksh)	484,500	841,000	275,100	602,400	516,000	620,400	520,500	675,900	**4,535,800**

1.9 LAKE KENYATTA FISHERY

During the year under review a total of 153 tons of fish with an ex-vessel value of Ksh. 15.33 million were landed from Lake Kenyatta in Lamu County of the coast province (Table 1.10).

This was a 7.8% decrease in quantity of the fish landed compared to the year 2020 which recorded a landing of 166 tons with an ex-vessel value of Ksh 16.67 million (Figure 1.16).

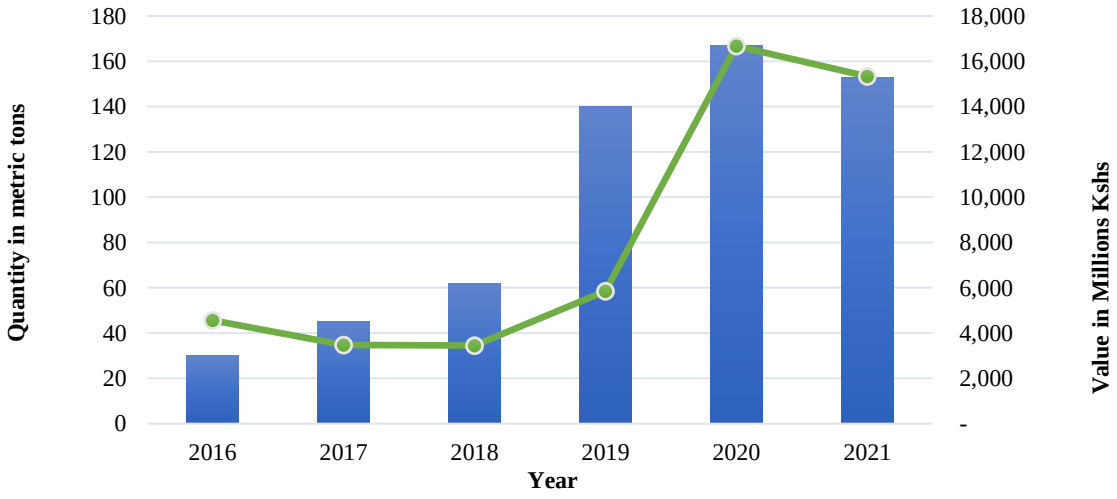

Figure 1. 16 Lake Kenyatta fish catch trends in metric tons 2016 – 2021

Catch composition for Lake Kenyatta was analyzed and compiled on a monthly basis for the year 2021. The dominant species caught were Tilapia (75,266 Kgs), Clarias (60,770 Kgs) and Protopterus (15,667 Kgs) (Table 1.10).

Table 1. 10 Lake Kenyatta Monthly fish landings by Species 2021

		SPECIES				
Month	**SPECIES**	**Tilapia**	**Clarias**	**Protopterus**	**Others**	**Sub-total**
January	WT(KGS)	6,554	4,788	2,042	390	**13,774**
	VAL(SHS)	655,400	478,800	204,200	39,000	**1,377,400**
February	WT(KGS)	6,083	4,374	1,732	290	**12,479**
	VAL(SHS)	608,300	437,400	173,200	29,000	**1,247,900**
March	WT(KGS)	5,993	4,275	1,689	211	**12,168**
	VAL(SHS)	599,300	427,500	168,900	21,100	**1,216,800**
April	WT(KGS)	6,242	3,736	1,419	83	**11,480**
	VAL(SHS)	624,200	373,600	141,900	8,300	**1,148,000**
May	WT(KGS)	6,253	5,442	1,257	101	**13,053**
	VAL(SHS)	625,300	544,200	125,700	10,100	**1,305,300**
June	WT(KGS)	6,482	6,069	1,364	101	**14,016**
	VAL(SHS)	648,200	606,900	136,400	10,100	**1,401,600**
July	WT(KGS)	6,786	6,150	1,400	135	**14,471**
	VAL(SHS)	678,600	615,000	140,000	13,500	**1,447,100**
August	WT(KGS)	6,954	5,863	1,375	121	**14,313**
	VAL(SHS)	695,400	586,300	137,500	12,100	**1,431,300**
September	WT(KGS)	6,268	5,353	1,148	122	**12,891**
	VAL(SHS)	626,800	535,300	114,800	12,200	**1,289,100**
October	WT(KGS)	6,179	5,236	1,148	41	**12,604**
	VAL(SHS)	617,900	523,600	114,800	4,100	**1,260,400**
November	WT(KGS)	5,986	4,842	668	0	**11,496**
	VAL(SHS)	598,600	484,200	66,800	0	**1,149,600**
December	WT(KGS)	5,486	4,642	425	0	**10,553**
	VAL(SHS)	548,600	464,200	42,500	0	**1,055,300**
Grand Total	**WT(KGS)**	**75,266**	**60,770**	**15,667**	**1,595**	**153,298**
	VAL(SHS)	**7,526,600**	**6,077,000**	**1,566,700**	**159,500**	**15,329,800**

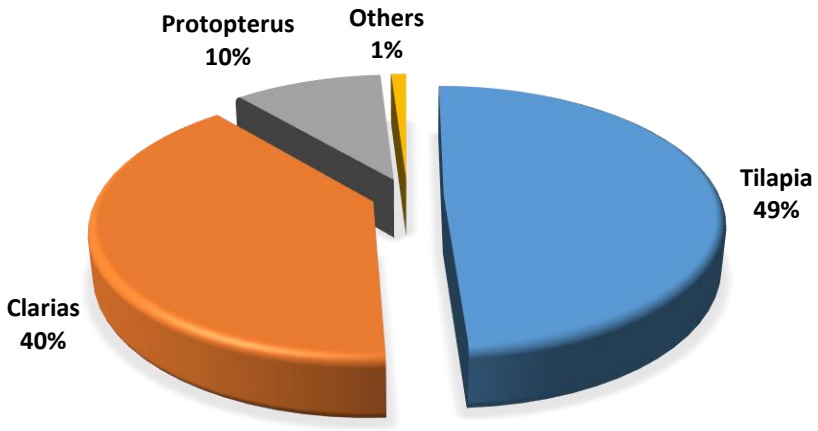

Figure 1. 17 Lake Kenyatta Fish Species composition in 2021

1.10 TANA RIVER DAMS FISHERY

In 2021, a total of 197 metric tons of fish with an ex-vessel value of Ksh 28.56 million was landed from the main fishery water bodies of the Tana River dams of Masinga, Kamburu, and Kiambere (Table 1.11).

This was 30% decline in quantity and 43.9 % decrease in value compared to 2020 landings of 283 metric tons valued at Ksh 50.96 million (Figure 1.18).

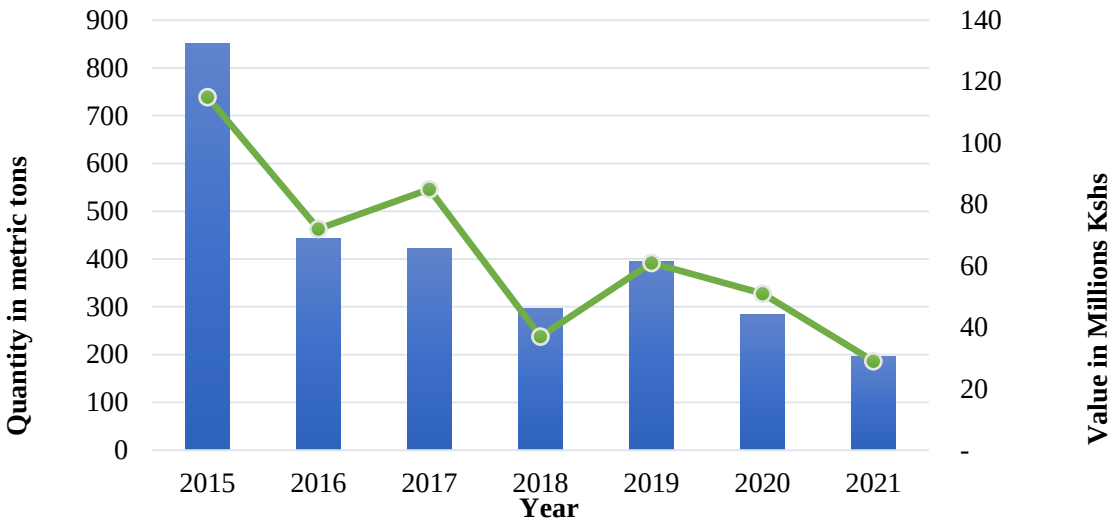

Figure 1. 18 Tana River Dams fish catch trends in metric tons 2015 – 2021.

Catch composition for the Tana River Dams was analyzed and compiled on a monthly basis for the year 2021. The dominant species caught were Carps (82,932 Kgs), Clarias (62,516 Kgs) and Tilapia Niloticus (52,321 Kgs) (Table 1.10).

Table 1. 11 Tana River Dams Monthly fish landings by Species 2021

Months	*Species*	**Clarias**	**Tilapia niloticus**	**Carps**	**Total**
Jan	Kgs	5,566	6,152	4,394	**16,112**
	Kshs	784,753	867,359	619,542	**2,271,655**
Feb	Kgs	7,031	8,496	9,081	**24,607**
	Kshs	991,268	1,197,782	1,280,387	**3,469,436**
Mar	Kgs	7,324	2,637	8,788	**18,749**
	Kshs	1,032,571	371,725	1,239,084	**2,643,380**
Apr	Kgs	9,081	5,566	9,374	**24,021**
	Kshs	1,280,387	784,753	1,321,690	**3,386,831**
May	Kgs	5,273	3,222	9,374	**17,869**
	Kshs	743,451	454,331	1,321,690	**2,519,472**
Jun	Kgs	3,955	4,394	8,496	**16,844**
	Kshs	556,211	619,542	1,197,782	**2,373,535**
Jul	Kgs	2,637	3,222	6,738	**12,596**
	Kshs	446,071	1,016,049	1,899,929	**3,362,049**
Aug	Kgs	3,955	2,812	3,252	**10,019**
	Kshs	556,211	396,507	458,461	**1,411,179**

Sep	Kgs	6,006	3,955	2,344	**12,303**
	Kshs	846,708	557,588	330,423	**1,734,718**
Oct	Kgs	4,980	3,515	6,444	**14,940**
	Kshs	703,525	495,634	4,130	**1,203,289**
Nov	Kgs	4,394	3,809	7,031	**15,233**
	Kshs	619,542	536,936	991,268	**2,147,747**
Dec	Kgs	2,314	4,541	7,616	**14,471**
	Kshs	326,292	640,194	1,073,873	**2,040,359**
Total	Kgs	**62,515**	**52,320**	**82,932**	**197,765**
	Kshs	**8,886,989**	**7,938,400**	**11,738,260**	**28,563,651**

1.11 LAKE KANYABOLI FISHERY

Lake Kanyaboli is one of the satellite lakes of Lake Victoria. 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*.

During the year under review, a total of 286 metric tons were landed from the lake. This was a 8% increase in quantity of the fish landed compared with 2020 figures of 264 metric tons (Table 1.12).

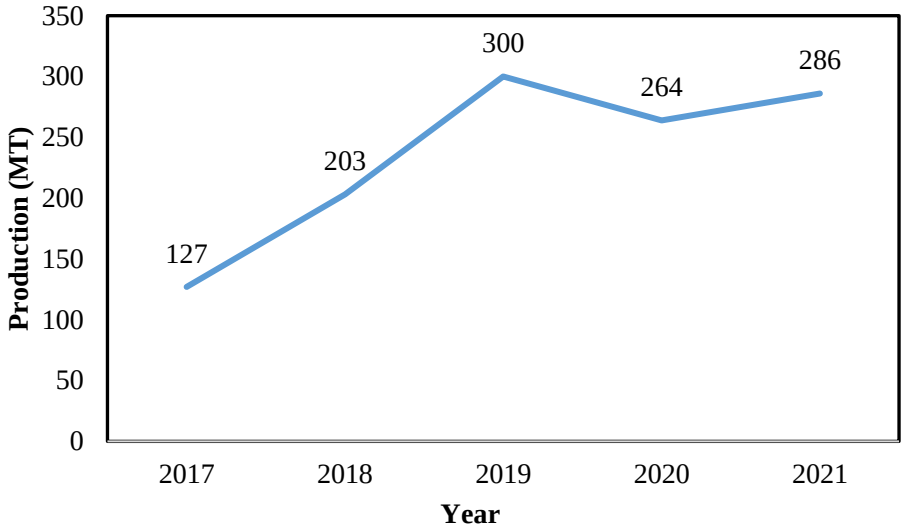

Figure 1. 19 Lake Kanyaboli fish catch trends in metric tons (2017-2021)

Table 1. 12 Lake Kanyaboli Monthly fish landings Weight (Kg) by Species-2021

MONTHS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
Clarias	491	386	641	1,003	836	428	599	754	790	623	438	539	***7,529***
Haplochromis	351	490	414	467	490	1,106	341	559	363	552	367	383	***5,881***
Protopterus	331	385	515	2,083	1,215	1,452	1,251	909	832	982	636	501	***11,090***
Tilapia others	21,960	26,620	22,417	19,413	26,884	21,968	25,306	15,073	20,107	17,859	21,131	22,760	***261,499***
TOTAL	**23,134**	**27,881**	**23,987**	**22,966**	**29,425**	**24,953**	**27,497**	**17,297**	**22,091**	**20,016**	**22,571**	**24,182**	**286,000**

Table 1. 13 Lake Kanyaboli Monthly fish landings Value by Species 2021

MONTHS	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
Value	Ksh	Ksh	Ksh	Ksh	Ksh	Ksh	Ksh	Ksh	Ksh	Ksh	Ksh	Ksh	Ksh
Clarias	98,173	88,837	147,610	242,829	202,483	99,290	139,014	182,667	191,214	150,910	106,081	130,424	1,779,531
Haplochromis	45,647	65,167	55,035	63,525	66,633	152,693	47,115	76,125	49,353	75,067	49,872	52,083	798,314
Protopterus	66,221	80,918	108,153	423,001	246,677	294,854	254,131	193,815	177,205	199,423	129,135	111,682	2,285,215
Tilapia others	5,546,515	6,753,638	5,687,387	4,724,316	6,542,446	5,389,579	6,208,462	3,647,164	4,865,290	4,311,822	5,101,621	6,432,699	65,210,940
Total	**5,756,555**	**6,988,560**	**5,998,184**	**5,453,672**	**7,058,240**	**5,936,415**	**6,648,721**	**4,099,771**	**5,283,062**	**4,737,222**	**5,386,709**	**6,726,888**	**70,074,000**

The fisheries of the lake were dominated majorly by Tilapia (51%), Protopterus (47%), and Haplochromines (2%) (Figure 1.20).

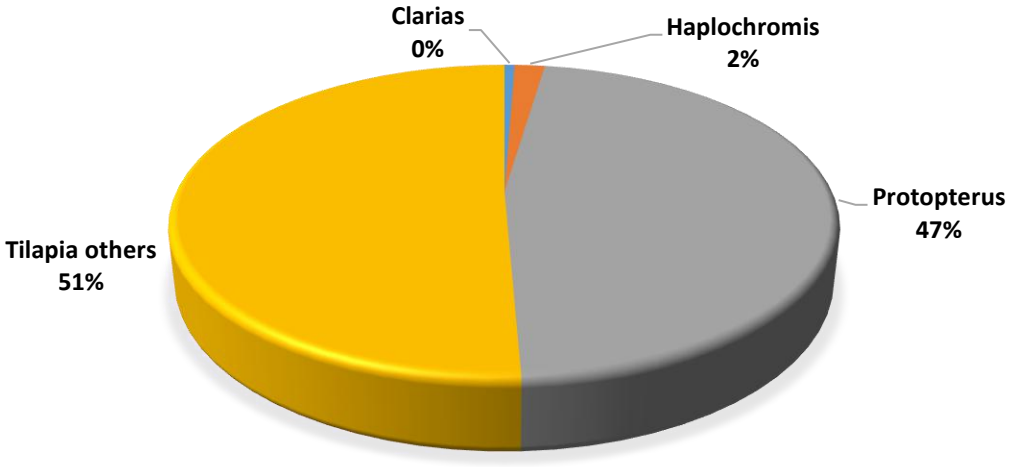

Figure 1. 20 Lake Kanyaboli species composition by weight (kgs)

1.12 SMALL DAMS

Small Dams, Including Small Water Bodies, are the most numerous freshwater environments globally. They are critical for freshwater biodiversity and are increasingly recognized for their role in ecosystem service delivery.

Small Dams often represent the best remaining examples of intact freshwater habitats and are the most likely to remain unpolluted, often being a refuge for species which have disappeared from larger, more degraded, water bodies.

In Kenya, Small dams remain among the least investigated part of the water environment and are largely excluded from fisheries management planning. Data was collected and analysed in order to establish their Carrying capacity for fisheries production.

Tilapia Niloticus was the most dominant species of fish caught in the small dams (50%). The other species dominantly caught in the small dams was Clarias (49%) (Table 1.13).

Table 1. 14 Small Dams Monthly fish landings by Species 2021

Month	Species	Black Bass	Clarias	Tilapia niloticus	Tilapia Others	Unspecified	TOTAL
Jan	**Kgs**	150	18,228	11,506	10	30	**29,923**
	Kshs	150,000	5,312,280	2,975,100	3,000	15,000	**8,455,380**
Feb	**Kgs**	120	17,826	10,786	15	-	**28,747**
	Kshs	120,000	5,284,660	2,878,772	4,500	-	**8,287,932**
Mar	**Kgs**	200	7,961	9,217	22	10	**17,410**
	Kshs	200,000	2,270,290	2,460,990	6,600	5,200	**4,943,080**
Apr	**Kgs**	406	7,995	10,225	6	-	**18,632**
	Kshs	402,400	2,152,280	2,836,630	1,800	-	**5,393,110**
May	**Kgs**	200	15,684	62,032	20	73	**78,008**
	Kshs	200,000	2,059,350	2,685,644	8,000	1,500	**4,954,494**
Jun	**Kgs**	52	8,975	11,599	10	-	**20,636**
	Kshs	44,800	2,318,850	3,068,770	4,000	-	**5,436,420**
Jul	**Kgs**	78	9,372	11,482	12	-	**20,944**
	Kshs	67,200	2,408,200	3,036,140	4,800	6	**5,516,346**
Aug	**Kgs**	400	17,584	12,279	2	3,000	**33,265**
	Kshs	400,000	4,993,340	3,271,510	800	-	**8,665,650**
Sep	**Kgs**	30	17,434	12,140	6	12	**29,623**
	Kshs	30,000	5,038,820	2,680,550	2,400	6,000	**7,757,770**
Oct	**Kgs**	50	17,390	10,780	17	5	**28,242**
	Kshs	50,000	4,965,400	2,795,460	6,800	2,500	**7,820,160**
Nov	**Kgs**	88	19,178	11,579	3	-	**30,848**
	Kshs	59,200	5,468,120	2,714,330	1,200	-	**8,242,850**
Dec	**Kgs**	512	28,573	14,515	2	-	**43,602**
	Kshs	504,800	3,438,640	4,048,060	800	-	**7,992,300**
Total	**Kgs**	**2,286**	**186,199**	**188,140**	**125**	**3,130**	**379,880**
	Kshs	**2,228,400**	**45,710,230**	**35,451,956**	**44,700**	**30,206**	**83,465,492**

2.0 AQUACULTURE (FISH FARMING)

2.1 INTRODUCTION

The Aquaculture sector is gaining momentum as production from catch fisheries decreases and demand increases due to population growth. There is already a significant gap (12,356 MT in 2017), between the projected demand and production of fish, which is expected to increase and is projected to be 360,000 MT/year by the year 2025 (Table 2.1).

This lack of supply has resulted in a continuous decline of per capita average consumption, due to rising prices and limited availability. This shows the significant domestic growth potential of the aquaculture sector. The GoK is looking into ways of promoting aquaculture and using fish products for food relief programmes as a means to enhancing food security and improving health.

The Aquaculture sector registered an estimated 43,494 farmers, total of 66,337 ponds, 38,622 being active, new 3,501 ponds with an estimated area of 1,961,798 m^2 excavated during the year 2021

Table 2. 1 Status of Inland Aquaculture Ponds in 2021.

Number of farmers	43,494
Number of operating ponds	38,622
Area of operating ponds (m^3)	12,665,648
Number of inactive ponds	22,843
Area of inactive ponds (m^3)	3,725,054
Number of new ponds	3,501
Area of new ponds (m^3)	1,961,798
Number of ponds stocked	10,643
Area of ponds stocked (m^3)	8,063,504

In 2021, fish farming production was 21,076 metric tons with a farm gate value of 6.714 billion Kenya Shillings compared to 19,945 metric tons valued at 6.303 billion Kenya shillings in 2020.

This production reflected an increase of 5.7 % in quantity and an increase of 6.5% in value. The total production from Mariculture was 103 MT valued at 2.568 million. This production reflected an increase of 21% in total production from last year's (2020) production of 85 MT valued at Ksh 2.199 million (Table 2.2).

Table 2. 2 Fish caught by Weight and Value from Aquaculture, mariculture and cage culture 2016-2021

	Aquaculture		Mariculture		Cageculture	
Years	**Weight (MT)**	**Value ('000 Kshs)**	**Weight (MT)**	**Value ('000 Kshs)**	**Weight (MT)**	**Value ('000 Kshs)**
2016	14,952	4,253,844	35	1,050	-	-
2017	12,356	3,691,046	51	1,530	228	79,656
2018	15,320	4,480,875	64	1,920	963	279,838
2019	18,542	5,581,142	76	1,895		
2020	19,945	6,303,617	85	2,119		
2021	21,076	6,714,893	103	2,568		

Fig 2. 1 Trends of Aquaculture, cage culture and mariculture fishery (2016-2020)

Aquaculture in Kenya was dominated by farming of 2 main fish species. The species include *Oreochromis niloticus* (75%), *Clarius gariepinus* (17%) and *Onchorynchus mykiss* (5%) (Figure 2.2).

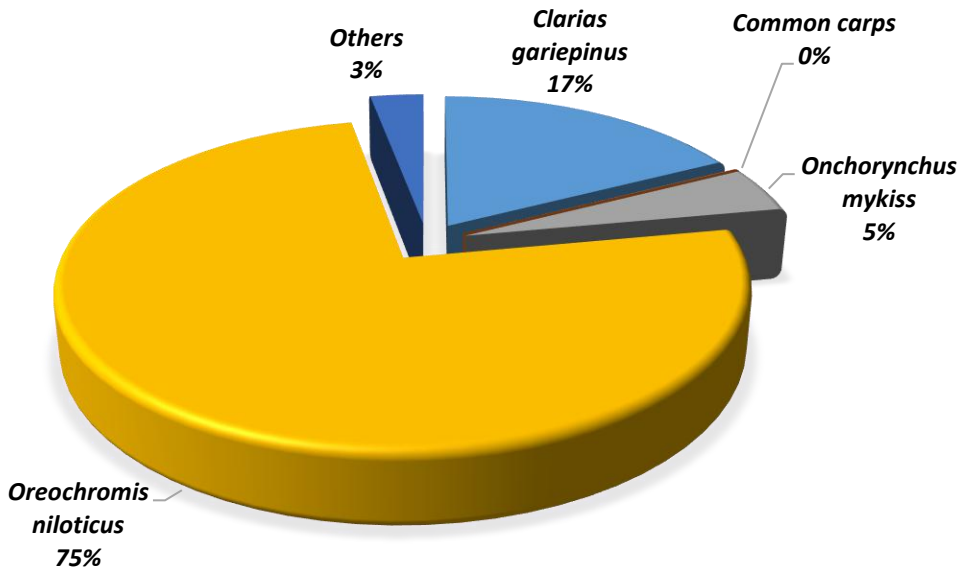

Figure 2. 1 Composition of Aquaculture production by Species (2021)

3.0 MARINE FISHERY

During the year 2021, the total production of marine landings was 27,306 metric tons with an ex-vessel value of 6,248 million Kenya shillings. This was an increase of 6% in quantity and 10% increase in value compared to 2020 figures of 25,741 metric tons with an ex-vessel value of 5,662 million Kenya shillings (Figure 3.1).

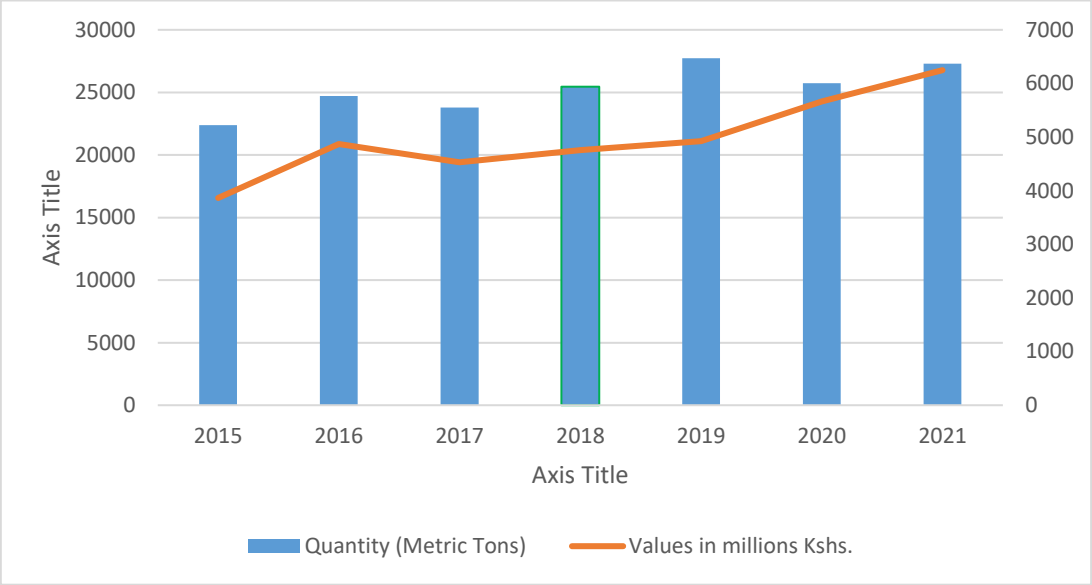

Figure 3. 1 Trends of marine fish production by quantity and value (2015-2021).

3.1 MARINE ARTISANAL LANDINGS

During the year under review, total production of artisanal marine landings was 25,380 metric tons with an ex-vessel value of 5,492 million Kenya shillings. This was an increaseof 7.8% in quantity and 7.9% increase in value compared to 2020 figures of 23,646 metric tons with an ex-vessel value of 4,835 million Kenya shillings.

Figure 3. 2 Trends of marine artisanal fish production by quantity and value (2014-2021)

In 2021, Demersals dominated artisanal marine fisheries catch accounting for 48% (12,264 metric tons) of the total landings. Pelagics contributed 20% (5059 metric tons), miscellaneous catch accounted for 10% (2,565 metric tons), Crustaceans contributed 8% (1,945metric tons) and Sharks & Rays and sardines accounted for 14% (3,547metric tons).

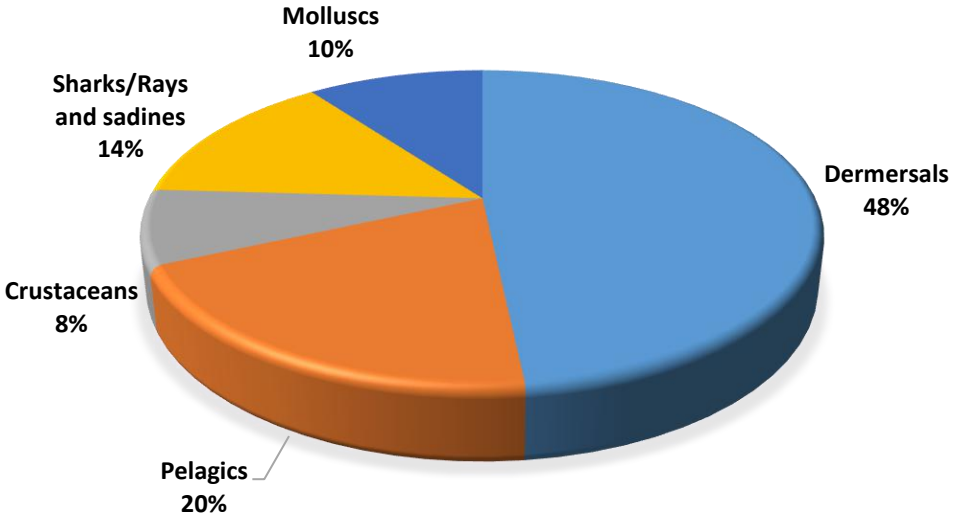

Figure 3. 3 Percentage contribution of marine fish species groups 2021

In this reporting period, Kwale county contributed the highest quantity of marine artisanal landing (10,106 MT - 39.8% of the total landings) with an ex-vessel value of Ksh.1725 million. Lamu county contributed 6,089 MT (24%) with ex- vessel value of Ksh1,048 million. Kilifi County with 4592 MT (18.1%) with ex- vessel value of Ksh.1,096 million.

Mombasa contributed 2,966 MT (11.7%) with ex-vessel value of Ksh.1,356 million with Tana River County contributing the least (1626 MT - 6.4%) with ex-vessel value of Ksh.264 million.

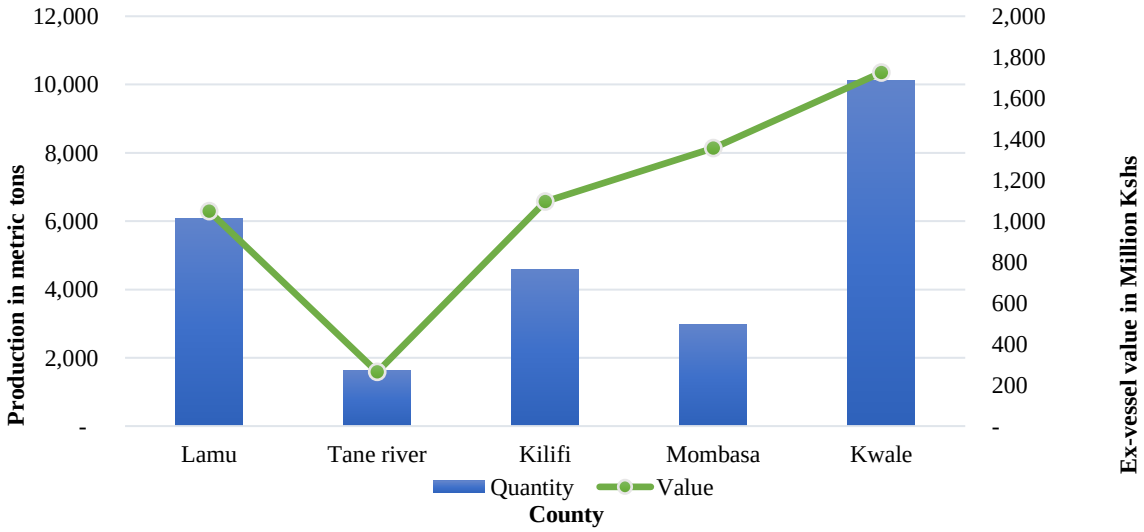

Figure 3. 4 Marine fish production by Quantity, and Value by Counties 2021

Table 3. 1 Marine fish landings by species, weight and value (2018-2021)

SPECIES		2018		2019		2020		2021	
Demersals		**Catch (Mt)**	**000 Kshs**	**Catch (Mt)**	**000 Kshs**	**Catch (Mt)**	**000 Kshs**	**Catch (Mt)**	**000 Kshs**
Siganidae	Rabbit fish	2,006	268,879	1,859	288,036	2,479	395,660	2,354	453,487
Lutjanidae	Scarvenger	1,369	193,956	726	113,280	1,984	276,776	2,030	360,966
Lethrinidae	Snapper	1,959	235,797	1,849	258,568	1,196	152,614	1,324	203,633
Scaridae	Parrot fish	1,770	185,077	1,483	162,695	1,937	222,499	1,839	258,214
Serranidae	Rock cod	631	104,598	479	86,805	708	85,533	557	109,795
Haemulidae	Black skin/grunters	1,306	197,975	1,013	167,094	1,009	158,546	1,012	180,877
Mugilidae	Mullets	624	77,011	698	88,565	683	155,638	342	49,145
Acanthuridae	Surgeon fish/Unicorn	840	142,587	649	108,047	790	72,909	695	109,189
Nemipteridae	Threadfin breams	0	0	-	-	-	-	-	-
Mullidae	Goat fish	329	54,824	280	49,300	393	60,650	322	62,534
Mixed demersal	Mixed dermasal	2,021	301,890	2,126	230,845	1,041	190,531	1,346	297,458
Gerreidae	Pouter	379	67,570	380	73,941	570	70,294	300	62,574
Scatophagidae	Streaker	313	74,094	258	72,505	89	7,888	236	40,373
Ariidae	Cat fish	179	22,708	194	22,898	347	45,326	250	32,087
TOTAL		**13,727**	**1,926,966**	**11,994**	**1,722,579**	**13,228**	**1,894,864**	**12,605**	**2,220,331**
PELAGICS									
Belonidae	Needle fishes	0	0	0	0	-	-	-	-
Scombridae	Little Mackerels/Kingfish/bonitos /tuna	1,894	323,292	2,737	363,699	1,953	444,091	1,613	270,112
Carangidae	Cavalla jacks/queenfish	943	174,412	1,553	170,879	820	174,894	1,011	183,079
Sphyraenidae	Barracudas	610	141,506	1,187	98,456	487	104,054	722	146,644
Hemiramphidae	Halfbeaks	0	0	-	-	-	-		
Clupeidae	Sardines	634	70,108	2,015	148,480	1,152	81,556	1,895	90,026
Engraulidae	Anchovies	0	0	-	-	0	0		
Istiophoridae	Sail fish	176	28,552	201	25,858	123	31,236	263	53,250
Xiphiidae	Swordfishes	0	0	-	-	137	23,153	571	141,248
Chirocentridae	Wolf Herrings	0	0	-	-	0	0		
	Mixed Pelagics	610	95,182	756	154,276	959	189,502	333	47,922
Chanidae	Milk fish	266	51,348	292	31,932	154	34,188	140	31,745
Menidae	Moonfish	0	0	-	-	0	0	-	-
Congridae	Eel	0	0	-	-	0	0	-	-
Coryphaenidae	Dolphin fish	248	36,347	191	20,991	83	14,932	64	10,201
TOTAL		**5,381**	**920,747**	**8,932**	**1,014,571**	**5,866**	**1,097,607**	**6,612**	**974,226**
SHARKS &RAYS		770	128,870	564	103,399	758	156,170	1,260	185,739
Mixed species		253	39,363	179	24,770	278	60,920	393	68,880
TOTAL		**1024**	**168233**	**743**	**128169**	**1037**	**217090**	**1652**	**254619**
CRUSTACEANS									
Palinuridae	Lobsters	424	407,971	347	426,966	449	391,072	582	492,843
Penaeidae	Crabs	664	266,601	641	287,424	667	289,377	800	353,602
Portunidae	Prawns	899	377,962	946	412,343	475	238,317	563	259,306
TOTAL		**1,987**	**1,052,534**	**1,934**	**1,126,733**	**1,591**	**918,766**	**1,945**	**1,105,751**
MISCELLANEOUS						0	0		
Octopodidae	Octopus	1,430	261,686	939	224,547	962	186,794	1,358	263,977
Loliginidae	Squids	554	148,880	614	147,290	441	107,907	576	130,540
Sepiidae	Cuttlefish	0	0	-	-	-	-	-	-
Holothuridae	Beche-de-mers	82	28,276	356	96,212	217	230,472	347	310,196
	Oysters	36	3,819	155	17,474	189	40,165	122	22,430
	Marine shells	0	0	-	-	117	142,046	162	209,729
TOTAL		**2,101**	**442,660**	**2,064**	**485,523**	**1,925**	**707,384**	**2,565**	**936,873**
TOTAL MARINE		**24,221**	**4,511,141**	**25,667**	**4,477,575**	**23,647**	**4,835,711**	**25,380**	**5,491,800**

Table 3. 2 Marine fish landing by species, weight, and value by counties 2021

Species		LAMU		KWALE		KILIFI		TANA RIVER		MOMBASA		TOTALS	
DEMERSAL		WT(KGS)	VAL(SHS)	WT(KGS)	VAL(SHS)	WT(KGS)	VAL(SHS)	WT(KGS)	VAL(SHS)	WT(KGS	VAL(SHS)	WT(KGS)	VAL(SHS)
Rabbit fish	Tafi	865	99,568	845	177,632	322	86,138	53	6,296	269	83,853	2,354	453,487
Scarvenger	Changu/Tangu	1,018	117,660	551	112,888	169	43,024	76	7,233	216	80,161	2,030	360,966
Snapper	Kiunga	641	74,474	306	46,935	173	44,212	136	16,919	67	21,093	1,324	203,633
Parrot fish	Pono/Mwera/Parati	1,010	109,575	460	65,120	212	39,692	27	2,392	130	41,435	1,839	258,214
Surgeon fish	Kangaja	21	2,282	110	12,923	61	9,573	11	739	84	27,168	287	52,686
Unicorn fish	Puju	120	13,676	208	22,127	38	5,415	3	215	39	15,070	408	56,502
Grunter	Pamamba	194	21,723	35	6,666	32	6,760	20	2,555	59	18,940	340	56,643
Pouter	Chaa	8	855	211	39,927	42	8,896	-	-	40	12,896	300	62,574
Black skin	Fute/Kufi	275	33,472	124	18,617	57	11,658	24	3,025	191	57,462	672	124,234
Goat fish	Mkundaji	81	8,606	149	31,084	43	9,728	17	1,981	32	11,135	322	62,534
Steaker	Mshigashawe	160	19,352	52	16,699	10	2,225	14	2,097	-	-	236	40,373
Rock cod	Tewa	119	14,333	169	26,905	104	24,277	67	6,885	98	37,395	557	109,795
Cat fish	Fumme	4	410	50	7,150	84	12,788	105	9,861	7	1,879	250	32,087
Mixed dermasal	Fulusi n.k	290	34,147	254	42,871	666	127,623	29	3,206	108	89,612	1,346	297,458
TOTAL		**4,807**	**550,132**	**3,523**	**627,544**	**2,011**	**432,007**	**582**	**63,405**	**1,340**	**498,098**	**12,264**	**2,171,186**
PELAGICS													
Cavalla jacks	Kolekole/Kandoizi	178	21,408	361	69,787	184	43,201	52	7,371	21	10,266	797	152,032
Mullets	Mkizi	183	21,561	63	10,398	50	11,425	40	4,077	6	1,683	342	49,145
Littla mackerels	Una/Mbono	-	-	272	30,486	500	91,844	238	8,609	35	9,645	1,045	140,583
Barracudas	Mizia/Mshio/Papa/Matengezi/chungichungi	73	8,457	260	41,694	239	60,580	68	7,746	82	28,167	722	146,644
Milk fish	Mwatiko/Myimbi	26	3,135	30	4,911	37	7,838	-	-	47	15,861	140	31,745
King fish	Nguru	24	2,972	137	34,154	339	89,373	47	6,954	24	7,795	571	141,248
Queen fish	Pandu	34	3,927	52	6,373	93	14,296	24	3,383	11	3,067	214	31,047
Sail fish	Sulisuli	17	2,442	44	14,068	117	24,123	69	7,542	16	5,076	263	53,250
Bonitos/Tunas		89	15,944	387	101,578	-	-	87	12,006	5	-	568	129,528
Dolphins		-	-	64	10,201	-	-	-	-	-	-	64	10,201
Mixed Pelagics		43	5,398	275	40,716	-	-	15	1,617	1	191	333	47,922
TOTAL		**667**	**85,244**	**1,944**	**364,365**	**1,561**	**342,680**	**641**	**59,307**	**247**	**81,750**	**5,059**	**933,346**
Sharks &Rays	Papa/Taa	98	10,684	593	58,315	208	36,326	124	12,084	236	68,330	1,260	185,739
Sardines	simusimu	-	-	1,699	56,174	134	23,073	26	3,329	36	7,449	1,895	90,026
mixed fish/Others		-	-	141	6,644	-	-	19	1,946	233	60,290	393	68,880
TOTAL		**98**	**10,684**	**2,433**	**121,133**	**342**	**59,399**	**169**	**17,359**	**505**	**136,069**	**3,547**	**344,645**
CRUSTACEANS													
Lobsters	Kamba mawe	108	157,917	140	100,761	81	113,990	26	58,872	227	61,303	582	492,843
Prawns	Kamba	53	29,183	274	108,316	166	39,801	106	54,466	202	121,836	800	353,602
Crabs	Kaa	192	143,254	240	82,733	79	20,812	20	2,456	32	10,051	563	259,306
TOTAL		**352**	**330,354**	**654**	**291,810**	**326**	**174,603**	**153**	**115,794**	**461**	**193,190**	**1,945**	**1,105,751**
MISCELLANEOUS													
Oysters	Mashaza	12	878	62	11,483	2	320	-	-	47	9,749	122	22,430
Beche-de-mers	Jongoo	26	52,436	121	35,182	7	1,472	11	644	182	220,463	347	310,196
Octopus	Pweza	104	15,560	886	169,014	285	67,212	64	7,188	18	5,003	1,358	263,977
Squids	Ngisi	19	2,719	478	104,508	58	18,279	7	1,170	14	3,864	576	130,540
Cowrie/Shell		4	582	5	586	-	-	-	-	153	208,561	162	209,729
TOTAL		**165**	**72,175**	**1,552**	**320,774**	**352**	**87,283**	**82**	**9,001**	**414**	**447,640**	**2,565**	**936,873**
TOTAL MARINE		**6,089**	**1,048,589**	**10,106**	**1,725,625**	**4,592**	**1,095,972**	**1,626**	**264,867**	**2,966**	**1,356,747**	**25,380**	**5,491,800**

3.2 MARINE INDUSTRIAL LANDINGS

The total landings from marine industrial fishery in the year 2021 was 1,926 Metric tons. Data showed that from the total catch, 77% came from the trawlers while long liners and crabbers contributed 22% and 8% of the total catches respectively (Fig 1.3).

Table 1. 15 Total landings from marine Industrial Fishery in 2021

Fishery	Weight (Kg)	% Weight
Longline	432,660	22%
Trawling	1,356,214	70%
Deepwater crab pot fishery	137,184.00	7%

Trawl Fishery

During the year under review, the industrial fleet had six (6) licensed and active trawlers. These vessels included, Alpha Manyara, Alpha Challenger, Mv Vega, Mv Robberto, Mv jackpot and Mv Jonas. A total of 1,339 tons of prawns, assorted finfish species and octopus, lobsters, cuttlefish, squids, Crabs and trash were landed by the industrial trawlers (Table 1.3).

On species composition assorted finfish dominated with 92% (1,243 tons), while prawns at 7% (96.8 tons) while others at 1% of the total catch which includes cuttlefish, octopus, lobsters, squids and crabs as shown in figure 3.5.

Table 3. 3 Table showing Trawl fishery production in 2021

Species	Weight of Catch (Kg)	% Caught
Octopus	8	0%
Crabs	28	0%
Lobsters	131	0%
Others	720	0%
Cuttlefish	1,661	0%
Squids	14,308	1%
Prawns	96,063	7%
Fin Fish	1,243,295	92%
Total Weight	**1,356,215**	

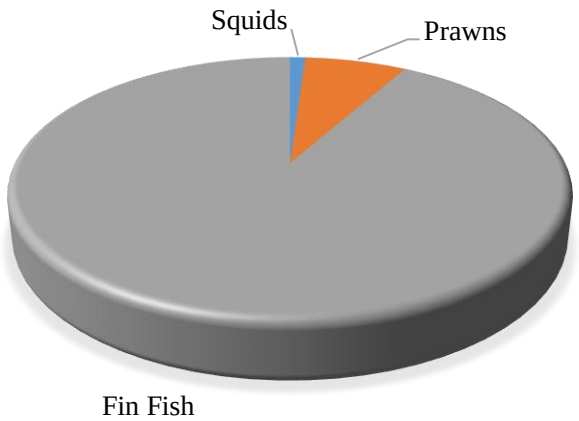

Figure 3. 21 Pie chart showing proportion of the major fish species caught through trawling

Deepwater crab pot fishery

Two (2) deep water crab pot vessels were licensed and active to fish beyond 12 nm in Kenyan waters. These vessels included the Diamond Ace 1 and MV Akhnaton. Both of the vessels targeted a crab fishery of the species *Chaceon fenneri*. During the year 2021, a total of 137 MT of crab was caught.

Table 3. 4 Total catch from the deep-sea pot-crab fishery, 2021

Vessel Name	Weight of Catch (Kgs)
Akhnaton	3,812
Diamond Ace 1	133,372
Total	**137,184**

Industrial longline fishery

The longline fishery conducted beyond the 12 nautical miles, within the 200 nautical miles in the Kenya's Exclusive Economic Zone (EEZ) and the high seas. In 2021, three industrial longline vessels (Miss Jane, Newfoundland Alert and Seamar II) were active in the Kenya EEZ.

The fishing effort was based on number of days fished, the number of hooked deployed, average length of setline and hours fished per set. During the year 2021, 436.7 MT of assorted fish was landed as compared to 668,546 Kgs in the year 2020 (Table 3.5).

Table 3. 5 Quantity of fish landed by industrial longlining (2021)

Fish Species Caught	***Total Catch (Kgs)***
Barracuda	921
Big Eye Tuna	17647
Blue Shark	63677
Dorada	1242
Escolar	468
Long Fin Mako	7363
Mako Shark	15033
Marlin	4061
Oil Fish	767
Sail Fish	1161
Silky Shark	10466
Sword Fish	297665
Yellow Fin Tuna	12189
Grand Total	**432660**

Of the 432 MT landed, 68% of the catch was composed of Swordfish while 17% was from Blue Sharks. The two species composed majority (82%) of the total longline catches for the year. Based on the catches reported, it's clear that most of the fishing was undertaken at night when the catches of swordfish outweigh those of the yellowfin and bigeye tuna, mainly caught during the day. Such targeting is mainly market based meaning swordfish market for the Kenyan long liners is more preferably compared to the tuna market. Bigeye 4%, Mako sharks 3.4%, yellow fin tuna 2.8%, silky shark 2.4% while others 4.7% included; longfin Mako, black marlin, shortfin Mako, sailfish and oil fish as per figure 3 below.

Industrial Fishing Grounds

Fishing areas for the industrial fishery was monitored through the Vessel Monitoring System and the logbook data. From the available data most, industrial vessels preferred the rich inshore marine fishing grounds around Lamu Archipelago, Ungwana Bay and Malindi Bank (Figure 3.5). This area is where the south flowing Somali Current meets the north flowing East African Current during the Northeast Monsoon season (November to March) causing up welling and enrichment. The area is also where two major Kenyan rivers Tana and Sabaki/Athi/Galana empty into the sea bringing enrichment from the land. It is in these areas that prawn trawling is majorly undertaken and where trawling surveys in the past have yielded reasonable catches of demersal fish. It was however noted that not much fishing was done in the North Kenya Bank which has been rich in fish in the past.

Longline fishing was mainly observed in the Kenyan EEZ, Tanzanian EEZ and to some extent in the high seas. There was no activity observed in the area next to the Somali EEZ. The situation is similar to last year's situation. Pot fishing was also mainly undertaken off Kilifi and mainly on the southern waters off Kilifi. The spatial extent of fishing was mainly below 30 nm.

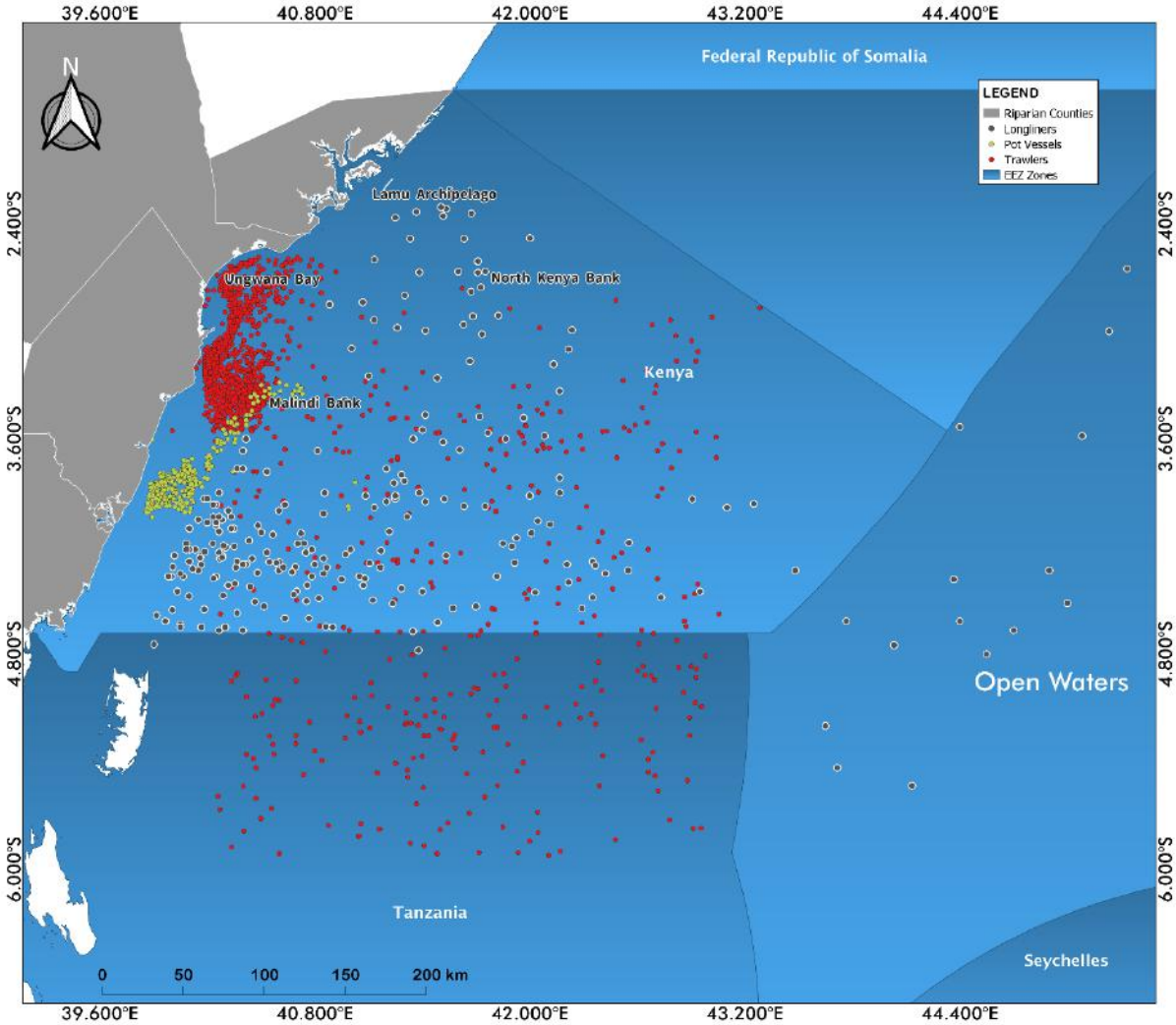

Figure 3. 5 Map showing the Kenyan coastline, riparian counties and fishing ground data for the year 2021

4.0 EXPORTS OF FISH AND FISHERY PRODUCTS

During the period under review, a total of 19,868 metric tons of fish and fishery products were exported earning the country Kshs. 3.6 billion in foreign exchange. This was a 5.1% decline equivalent to 449 metric tons from the previous year of 8821 metric tons. The main markets for the marine ornamental fishes were the EU, USA, China and Japan

Table 4. 1 Fish and fish products export by weight and value

Commodity	M. Tons	Million. Ksh
Nile Perch	1436	1269.2
Fish heads, tails and maws	64.6	551.4
Octopus	1081.6	524.1
Other Fish	212.81	295.1
Lobsters	407	237.4
Sword fish	428.97	220.7
Crabs	449.9	108.6
Tilapia	645.9	101.4
live ornamental fish	507.5	60.18
Livers and roes	9.4	58.8
Shrimps and prawns	32.8	43.88
Sardines	164.5	22.1
Mackerels	164.3	21.97
Crustaceans meals and pellets	78.5	15.5
Catfish	50.8	10.4
Dogfish and sharks	55.4	9.5
Tunas and tuna-like	30.4	8.6
Salmon	13971	8.39
Carps	28.7	4.5
Trout	8.6	4.4
Live fish	29.2	3.44
Cuttle and squids	5.6	3.1
Flat fish	1.6	1.4
Sea cucumber	2.7	1.34
GRAND TOTAL	**19867.78**	**3585.4**

4.1 Aquarium fish exports

In 2021, 498,908 aquarium fish valued at 609,668 USD were exported compared with an average of 272,696 fish valued at 275,830 USD exported in 2020.

This represented an 83% decline in the volumes of aquarium fish exported. The top 5 species in terms of value were *Zebrasoma sp., Nemanthias Sp. chromins sp., Pseudanthias Sp. and Paracanthurus hepatus* (Table 4.2)

Table 4. 2 The monthly composition of the top 20 most exported marine aquarium fish species in 2021

Species	Pieces	Total Weight (Kg)	Value Per Piece (USD)	Total Value (USD)
Zebrasoma sp.	18,690	208	3,876	48,915
Nemanthias sp.	22,568	175	1,179	45,530
Chromis sp.	65,973	334	893	39,821
Pseudanthias sp.	18,167	126	1,389	35,646
Paracanthurus sp.	16,199	149	1,737	34,537
Acantharus sp.	21,310	397	4,565	33,950
Centropyge sp.	22,701	212	1,497	27,829
Labroides sp.	23,855	163	879	18,823
Pomacanthus sp.	7,933	325	6,269	17,992
Valenciennea sp.	17,985	163	1,225	16,885
Chaetadon sp.	11,305	255	2,867	16,343
Pseudocheilinus sp.	17,389	127	826	16,286
Anthias squannipinnis	27,946	157	363	15,634
Halichoeres sp.	14,962	171	1,427	15,375
Ecenius midas	13,029	131	948	14,903
Paracheilinus sp.	10,997	105	1,592	14,544
Macropharyngodon sp.	10,710	137	1,128	11,612
Ctenochaetus sp.	7,584	151	1,925	10,273
Cirrhilabrus sp.	8,146	80	792	8,744
Others	141,459	2,717		166,023
Total	**498,908**	**6,284**		**609,668**

4.2 Aquarium Invertebrate

The number of marine invertebrates' pieces exported in the year 2021 was 350,309 and was valued at 199,551 USD which was a 6.7 % decline in comparison to 2020 whose exported pieces was 124,856 valued at 69,326 USD exported in 2020 (Table 4.3). The top 5 species being *Nerita Polita, calibanus africanus, calcinus laevimanus, lysmat grabhanii and cerithium caeruleum* (table 4.3)

Table 4. 3 The monthly composition of the top 20 most exported marine invertebrate species in 2021

Species	**Pieces**	**Value Per Piece (USD)**	**Total Value (USD)**
Nerita polita	64954	152	25650
Calibanarius africanus	37807	50	16942
Calcinus laevimanus	25775	67	16150
Lysmata - grabhanii	17720	286	15879
Cerithium caeruleum	38906	94	14282
Hippolysmata grabhami	15811	360	13828
Tectus pyramis	15122	53	8298
Cypraea Moneta	7751	52	6432
Dolabella auricularia	9951	285	5310
Sarcophyton Ehrenbergi	2151	938	4864
Radianthus spp.	2202	735	4401
Clibinareus sp	25907	26	4327
Heteractis Magnifica	3807	516	4217
Zoanthus Protopayathoa	1480	798	3881
Trochus maculatus	12487	78	3492
Lunella coronata	11168	34	2915
Palythoa natalensis	1200	238	2905
Hymenocera - picta	4149	188	2750
Hymenocera elegans	2964	203	2668
Cespitularia (phosphor polyp)	888	334	2001
OTHERS	48109	1	38360
TOTALS	**350,309**	**5,487**	**199,551**

5.0 IMPORTS OF FISH AND FISHERY PRODUCTS

In 2021, Kenya imported 21,386 metric tons of fish and fishery products worth Ksh 2.9 billion this being a 45 % reduction of quantities imported as compared with 19,891 metric tons of fish and fishery products worth Ksh 2.25 billion imported in 2020.

The imports were mainly composed of *Tilapia* 10,735 MT (50%), *Mackerel* 4,931 MT (23%) and *Nile perch* 1,289 MT (6%) of the total fish and fishery products imported during the year. Notably there was drastic decline in importation of frozen sardines 0.145 MT. The imports originated largely from Asian countries, notably China, Korea and Vietnam with most of the *Oreochromis niloticus* was imported from China, Tanzania and Uganda

Table 5. 1 Fish Imports by weight and value

Product	**Quantity (M. Tons)**	**Value (Million Ksh)**
Tilapia	10,735	1415.8
Mackerel	4931	662.95
Nile Perch	1289	327.6
Catfish	121	131.7
Salmon	163.2	94.0
Cod fish	456.87	58.4
Flat fish	280.7	34.3
Trout	726	27.9
Frozen Fish Meat	726	27.9
Other fish	237	27.24
Shrimps and prawns	207.8	21.9
Sardines	0.145	12.3
Dried fish	1305.3	10.9
Tuna and Tuna-like	15.9	10.2
Live ornamental fish	34.6	8.41
Herrings	54.6	5.7
Lobster	9.3	4.98
Cuttle fish	3.6	3.87
Crabs	49.5	2.67
Carps	32	2.5
Octopus	3.8	2.5
Mussels	3.3	1.3
Anchovies	0.44	0.441
Other live fish	0.187	0.41
Scallops	0.2	0.21
Grand Total	**21,386.4**	**2,896.1**

Table 5. 2 Origin of Fish imports by weight and value

Country	Quantity (KG)	Value (KSHS.)
Italy	996,058	664,044,946
Hong Kong	93,777	554,929,819
Spain	647,751	325,018,105
Netherlands	479,233	272,173,180
Portugal	291,389	209,836,569
Israel	225,839	196,130,473
Democratic rep of Congo	5,631,748	174,769,262
Uganda	147,518	171,164,999
Rwanda	82,841	168,706,760
Greece	217,955	133,730,573
China	649,544	124,266,446
Reunion	242,552	107,322,251
Tanzania	51,080	64,576,665
United Arab Emirates	134,755	56,270,216
Romania	48,445	42,423,411
Jordan	32,242	34,885,066
Australia	41,690	32,732,750
United states of America	218,427	29,774,717
South Africa	64,305	27,607,705
Others	505,019	144,287,861
TOTAL	**10,802,168**	**3,534,651,774**