Indian Ocean Tuna Commission
Commission des Thons de l'Ocean Indien
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Received: 16 November 2016
IOTC–2016–SC19–NR19

Mozambique National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2016

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INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

In accordance with IOTC Resolution 15/02, final scientific data for the previous year was provided to the IOTC Secretariat by 30 June of the current year, **for all fleets other than longline** [e.g. for a National Report submitted to the IOTC Secretariat in 2016, final data for the 2015 calendar year must be provided to the Secretariat by 30 June 2016)	YES The data from Industrial Mozambique tuna fleet, semi-industrial linefishery, sport fishery, recreational fishery and artisanal fishery were sent, to the IOTC secretariat on 30th June 2016. Also, these data are reflected in this report.
In accordance with IOTC Resolution 15/02, provisional **longline data** for the previous year was provided to the IOTC Secretariat by 30 June of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2016, preliminary data for the 2015 calendar year was provided to the IOTC Secretariat by 30 June 2016). **REMINDER:** Final longline data for the previous year is due to the IOTC Secretariat by 30 Dec of the current year [e.g. for a National Report submitted to the IOTC Secretariat in 2016, final data for the 2015 calendar year must be provided to the Secretariat by 30 December 2016).	YES Mozambique has submitted the preliminary data of longline fleet of the year 2015, to the IOTC secretariat on 30th June 2016. The final longline data are reflected in this report. However, Mozambique will submit these finale data formally to the secretariat before the deadline 30 December 2016.
If no, please indicate the reason(s) and intended actions:	

Executive Summary

This document represent an update of all related fishing activities in Mozambique for species under the IOTC mandate in order to comply with the IOTC rules of providing information whenever requested within the agreed procedures. The summary also, provides an update of ongoing actions across the country to ensure a long term sustainable exploitation management of species under the IOTC mandate.
Similar to previous years the tuna fishery in 2015 was dominated by the distant water fishing nations -DWFN- accessing the resources through fishery Partnership Access Agreement. The total catch reported by these fleets was 3,079 tons. The national industrial fleet for tuna in 2015 operated with a total of nine longline vessels, although some vessels exhibited low operationally. The total catch of this fleet was 270.5 tons. Compared with the previous year, which only two vessels operated in December producing only 7.5 tons, it can be stated that 2015 marked the establishment of a national industrial fleet for tuna in Mozambique.

The recreational and sport fisheries which also target on IOTC primary species show evidences of increasing impacts traduced on the rapid increase of number of licences in the last years. While fishing competitions events takes place episodically on predefined location and time sites, the recreational fishing occur routinely from different sites along the cost and data collection of this segment still very deficient.

The artisanal sector is the major and most complex fishing sector in Mozambique. Catches of IOTC species by this sector is relatively low when compared with small pelagic and demersal fishes catches. The estimated total catch of IOTC primary species by the artisanal coastal fisheries in 2015 was 4236 tons, a figure not different from 2014. However, due to lack of well trained personal and insufficient financing of the monitoring schemes in place (SNAPA), it is suspected that the real contribution and impacts of these fisheries on tuna species is currently poorly known.

Despite the above mentioned difficulties there is in place efforts to improve the quality of data collection and reporting to the IOTC for full compliance with the resolution 10/02.

In 2015, a pilot assessment of SNAPA, was conducted in two provinces (Cabo Delgado and Nampula) where comparatively with other coastal provinces, artisanal fisheries shows significant catches of tuna species and billfishes. Based on findings of this assessment, it was proposed recommendations and an action plan to improve the level of data collection and reporting according to IOTC Standards, on the view to expand the same initiative to other coastal provinces.

Furthermore, Mozambique started an internal reflection in regard to its institutional arrangement under the MIMAIP to better address the issues of fisheries statistics data. Within this process it was identified that the actual master plan of fisheries statistics needs to be revised and this task was planned to 2016.

Currently Mozambique is fully implementing the Vessel Monitoring Scheme – VMS to monitor all licensed tuna vessels (both national and foreign).

On Part State Measures, Mozambique is making efforts to follow all the steps required and has updated its inspection report form and advance request to enter into port – AREP which are being used during the pre-inspection of foreign tuna vessels.

The pre-fishing briefing for all licensed vessels is also one of the areas where Mozambique is keen to move to in order to help in combating IUU fishing in the region.

Finally, Mozambique is internally making efforts to improve monitoring and control of the tuna fisheries through internal initiatives involving different stakeholders (management, research and surveillance) and is willing to enhance dialog between them and operators.

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1. BACKGROUND / GENERAL FISHERY INFORMATION

Mozambique is located in the south-eastern part of the African Continent, between latitudes 10°27' S to 26°52' S and longitudes 30°12'E and 40°51'E. The country has the third longest coastline in the Indian Ocean with the total length of more than 2,500 km. Total continental shelf area is about 104,300 km^2 and the EEZ area is 999, 000Km^2. The coastal areas of Mozambique are divided into seven different provinces that can be separated into three macro-areas: (i) northern coast (Cabo-Delgado and Nampula Provinces) with a coast line of about 770 km and characterized by rocky and coral-bearing sea bed and a narrow continental shelf. (ii) Central coast (Zambezia and Sofala provinces) with a cost line of about 980 km facing the Sofala bank. (iii) The southern coast (Inhambane, Gaza and Maputo Provinces), that is about 950 km long and it has some coral and rock bottom in some areas and sand in others. The main and more productive fishing area for the national fishing fleets is the Sofala bank area. However, other areas as described above are used by the fishers.

The fishing sectors operating along the coastal area are the *artisanal*, *the* semi-industrial *and industrial* (shallow water shrimp and deep water lobsters trawlers, longliners and line fishing).

The artisanal fishing sector has particular importance for the country´s food security. It operates in the coastal provinces where two thirds of the population live and also in the inland areas where around 20% of the artisanal fisheries catch, comes from. The total catch from artisanal marine sector, is around 150,000 tons/year, and represents around 90% of the country catch; the fishery usually operates from beaches, or near coastal waters (generally within 3 miles), with a wide range of gears, from beach-seines, to hand-lines, gillnets, purse seines and longlines deployed by a mixed fleet of vessels less than 10 m in length. Vessels usually conduct daily fishing trips using one type of gear, but in some cases multiple gears are employed simultaneously. Beach-seines are responsible for most of the catches, around 38% of the total catch; the catches are composed mostly by small pelagic fishes, small demersal species and smaller part of the catch include tuna and tuna like species. The data collection systems in place, implemented by the Fisheries Research Institute doesn´t cover adequately information regarding IOTC species.

The industrial fishing sector is distributed among *shallow water shrimp trawling* and *the deep water crustaceous trawling* with almost no impact on tuna and tuna-like species; and the longline tuna fishery.

The semi-industrial sector is characterised by vessels between 10 to 20 m in size. It is sub-divided in shrimp trawling and line fishery. The industrial line fishing targeting primarily the bottom fish (large demersal species), with a potential impact on the narrow-barred Spanish mackerel.

The national fishing sectors that directly target on species under the IOTC mandate are the industrial tuna longliner fleet and Sport and Recreational fishery. The industrial tuna longliner fleet is currently (2015) composed by nine vessels and rapid growth is expected with the implementation of the Tuna Fishery Development Plan (FDP).

The practice of Recreational and Sport fisheries is more active in the southern coast (21°S to 26°S). Tuna and tuna-like species are captured on boat based operations (fibreglass ski boat; 3-9m length), using mainly hook and line operated with a fishing rod and manual reel.

2. FLEET STRUCTURE

Foreign Distant Waters Fishing Nations are the main group fishing tuna and tuna-like species from Mozambique fishing area. The number of fishing vessels during 2015 fishing in the Mozambican fishing area was comprised by 23 longliners and 8 purseiners (Table 1). The reduction in number of issued licenses has two different moments: the earlier one related with the issue of piracy which caused insecurity along the northern part of the Mozambican channel and the more recent scenario that have to do with pending concusses between the parties to re-new the EU Partnership Access Agreement.

Table 1. Number of fishing licenses issued to foreign vessels to fish in the Mozambican fishing area, during the last seven years: 2007 to 2015 (Source: ADNAP annual reports MIMAIP, 2016).

	N° licenses	
Year	Purse-seiners	Longliners
2007	51	110
2008	47	75
2009	41	70
2010	34	37
2011	34	39
2012	23	35
2013	18	27
2014	22	34
2015	8	23

The tuna national fishery is in its incipient phase. It started with one longline vessel licenced in 2012. Despite registered, this vessel did not operate in the following years. In November 2014 two new longline vessels were licenced and operated during December. In 2015 other seven boats were introduced increasing the fleet to a total of nine longliners.

Recreational fishing (recreation and fishing competitions) is the other sector that target on IOTC primary species. The annual number of recreational licenses issued in coastal provinces is presented in the Table 2. It can be seen that the main area for recreation is the southern coast (Maputo, Gaza and Inhambane) with 92% of the licences issued. On general the number of licences issued was increasing rapidly in the last years. However, in 2015, the number of licences issued dropped about 8% comparatively to 2014.

Table 2. Number of recreational licenses (Recreational and Sport fishing) issued for coastal provinces by ADNAP from 2011 to 2015.

Year	Cabo Delgado	Nampula	Zambezia	Sofala	Inhambane	Gaza	Maputo	Total
2011	189	20	14	55	875	523	1241	2728
2012	161	0	6	62	702	390	1581	2741
2013	306	24	10	46	922	542	1702	3552
2014	201	27	2	110	2008	361	2144	4853
2015	174	78	0	67	1844	396	1893	4452

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The gears, vessels size and duration of fishing operation by the artisanal, recreational and sport, semi-industrial and industrial fisheries fleet are described bellow in the Table 3.

Table 3: Summary description of the vessel types and gears by fishery sector operating along the Mozambican coast and impacting on the species under IOTC mandate

Fishery Sector	Vessel	Crew	Main gear types	Comment on catch, operations and duration of the trip
Artisanal Fishermen were around 130,000 in 2012 and the number of fishing boats is 39,550 units. About 88% of the boats of artisanal fishing are canoes (IDPPE 2012).	N/A	N/A	Handline and beach seine	Artisanal fisheries are multi-gear and multispecies and occur along all the coastal provinces, targeting almost everything and are formally licensed. The main species are small pelagic and small demersal fish of the inshore coastal area and estuaries where the fishery occurs. No mean of catch conservation or iced catch (1 day trip maximum).
	Canoe < 3m (paddle) Boat, 3-8m (paddle/sail) Boat 5-10m (outboard)	1-6	Handline/trap, beach seine, gillnet, purse seines and longlines	
	Skiboat, 5-8m	3-6	Rod + line	
Recreational and sport fishing No accurate data is available; around 50 boats operate annually	N/A	N/A	Rod + line	In the domestic recreational fishing there is undocumented number of people fishing as leisure and to supplement domestic food. The sport fishing is more organised. The fishers belong to a club that normally sets standards for fisher ethics and organises tournaments. The recreational spear fishing involves individuals who dive without scuba equipment using spear guns to target selected species. The catch is composed by pelagic species only.
	Skiboat – sport, 5-8m	2-6	Rod + line	
	Skiboat –spear, 5-8m	2-6	Spear	

Semi-industrial An average of 21 operational vessels/month	10-20m	10-15	Rod + line/ handline	The species caught are mainly the large bottom fish. However, it impacts in pelagic such as the Spanish mackerel. Fishing operations takes place more offshore; activity formally licensed; Iced catch (7 to 12 days trip); Port-based activity.
Industrial An average of two operational vessel/month	vessels >23m (many are 23.3m)	15-30	Longlines	The fishing operations takes place more offshore**;** activity formally licensed. The longline fleet is oriented to catch tuna and tuna-like species with minor impacts on neritic species. Frozen catch; up to 15 days trip; Port-based activity.

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The annual fishing licenses by gear by fishery sector are described in the Table 4, bellow.

Table 4. Summary of fishing licenses by gear issued for artisanal fishery, semi-industrial, Industrial, recreational and sport fishery in the last years. Source: ADNAP (2012, 2013, 2014 and 2015), for all fisheries except artisanal and IDPPE 2012, for artisanal fisheries.

Fishery sector	*Gear*	*N# licenses 2011*	*N# licenses 2012*	*N# licenses 2013*	*N# licenses 2014*	*N# licenses 2015*
Artisanal fishery						
	Beach seine	-	9.042	*9916*	*9916*	*9916*
	Handlines	-	*12.683*	*13853*	*13853*	*13853*
	Gillnets	-	*14.817*	*20396*	*20396*	*20396*
	longlines	-	*678*	*1077*	*1077*	*1077*
	Purse seine	-		*563*	*563*	*563*
Semi-industrial						
	Sofala bank Shallow water shrimp	*15*	*14*	*22*	*1*	
	Linefishery	*25*	*43*	*40*	*34*	40
Industrial						
	Sofala bank Shallow water shrimp;	*51*	*57*	*44*	*35*	
	Pelagic longline tuna	*1*	*1*	*0*	*2*	9
Recreational & sport						
	Coastal provinces Recreational and sport fishing	*2.728*	*2.741*	*3.552*	4.853	4.452

- **Comments on artisanal fisheries**

Information based on census of artisanal fishing (IDPPE 2012). Data refers to coastal provinces only. This is a multispecies fishery with a considerable impact in tuna and tuna-like species.

- **Comments on semi-industrial and industrial shrimp fishery**

Sofala bank Shallow water shrimp *was included because significant amount of marine turtles are captured and released.*

3. CATCH AND EFFORT (BY SPECIES AND GEAR)

The estimated total catches of tuna and tuna-like species from DWTFN and national fleets in 2015, account to 3079 tons. This catch represents only 20% of the catch levels of the previous year (15,116.13 tons). This enormous drop can be explained by the reduction in number of issued licenses that have to do with pending concuss between the parties to re-new the EU Partnership Access Agreement.

CATCH AND EFFORT BY THE DWTFN

The Mozambican fishing zone is assessed by the foreign vessels primarily in a seasonal base, when the tuna resource is abundant in the Mozambique Channel. The annual catch of the main tuna species reported by the foreign vessels in 2015, by gear, is presented below, Table 5.

Table 5. Catch and Effort of DWTFN operating in Mozambique waters in 2015.

	Longline	Purse Seine	Total DWTFN
Short Bill	0,6	0	0,6
Yellowfin	2220,4	17	2237,4
Bigeye	230,9	0	230,9
Black Marlin	73,0	13	86,0
Sailfish	44,8	0	44,8
Swordfish	112,1	0	112,1
Striped Marlin	44,3	0	44,3
Others	190,1	0	190,1
Blue Marlin	14,3	0	14,3
Skipjack	0,0	118	118,0
Total Catch (KG)	2930,5	148	3078,5
Total Effort (Days)	2224	5	2229

Table 6. Annual catch in tons of the tuna primary species and the fishing effort for the Mozambican fishing area (ADNAP annual reports).

Species	2010	2011	2012	2013	2014	2015
Skipjack	2345	1162	249	21	12	118
Albacore tuna	248	663	114	229	212	-
Bigeye tuna	274	387	154	257	361	231
Yellowfin tuna	1613	2280	890	2096	2275	2237
Swordfish	837	463	920	590	205	112
Others	603	465	99	448	-	190
Black marlin	-	-	-	-	-	86
Blue marlin	-	-	-	-	-	14
Striped marlin	-	-	-	-	-	44
Sailfish	-	-	-	-	-	45
Total catch (tons)	6640	5925	2426	4149	3065	3079
Effort (fishing days)	2727	2412	1551	1734	2215	2229

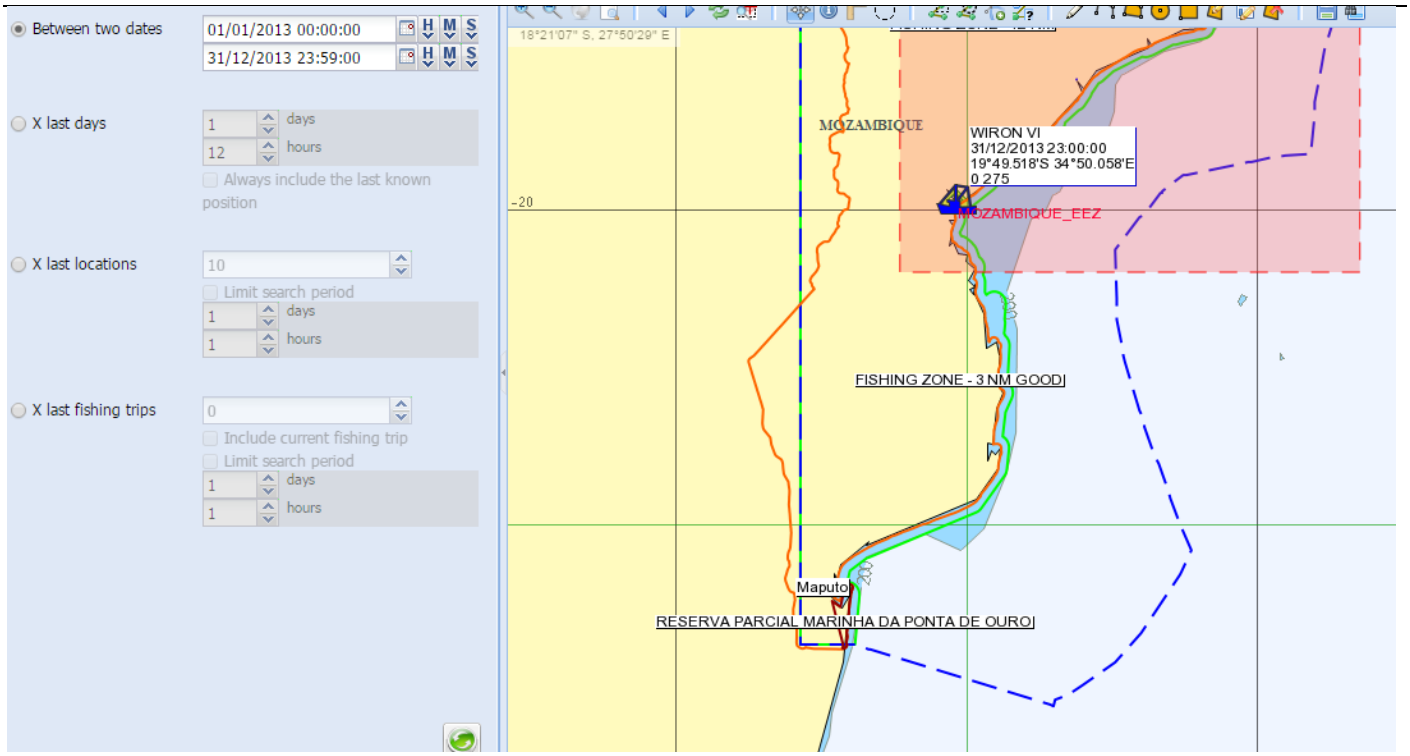
- **CATCH AND EFFORT BY THE INDUSTRIAL NATIONAL FLEET**

For the national fleet the most important species in terms of catch quantities are Swordfish (35%), Yellowfin tuna (25%) and Bigeye tuna (16%) (Table 7). The fishing effort from 2014 to 2015 had a huge increase explained by the rapid growth of the fleet.

Table 7. Annual catch variation in tons and the fishing effort (ADNAP annual reports and MIMAIP, 2016).

	year 2014	years 2015
Albacore		3701
Bigeye	780	33631
Yellowfin	1389	51254
Skipjack		1780
Swordfish	3365	72891
Striped Marlin		147
Blue Marlin		1717
Black Marlin		8521
Sailfish		290
Short Bill		6100
Blue shark		10733
Hammer Shark		1443
Mako Shark		1472
Other	1947	13820
Total Catch (KG)	7481	207500
Total Effort (Days)	6	310

The map of fishing effort distribution presented bellow is related to the industrial longliners fishing vessels in 2013, 2014 and 2015. The red dots refer to the positions where the fishing activity occurred.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X last days
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Always include the last known position
X last locations
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Limit search period
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X last fishing trips
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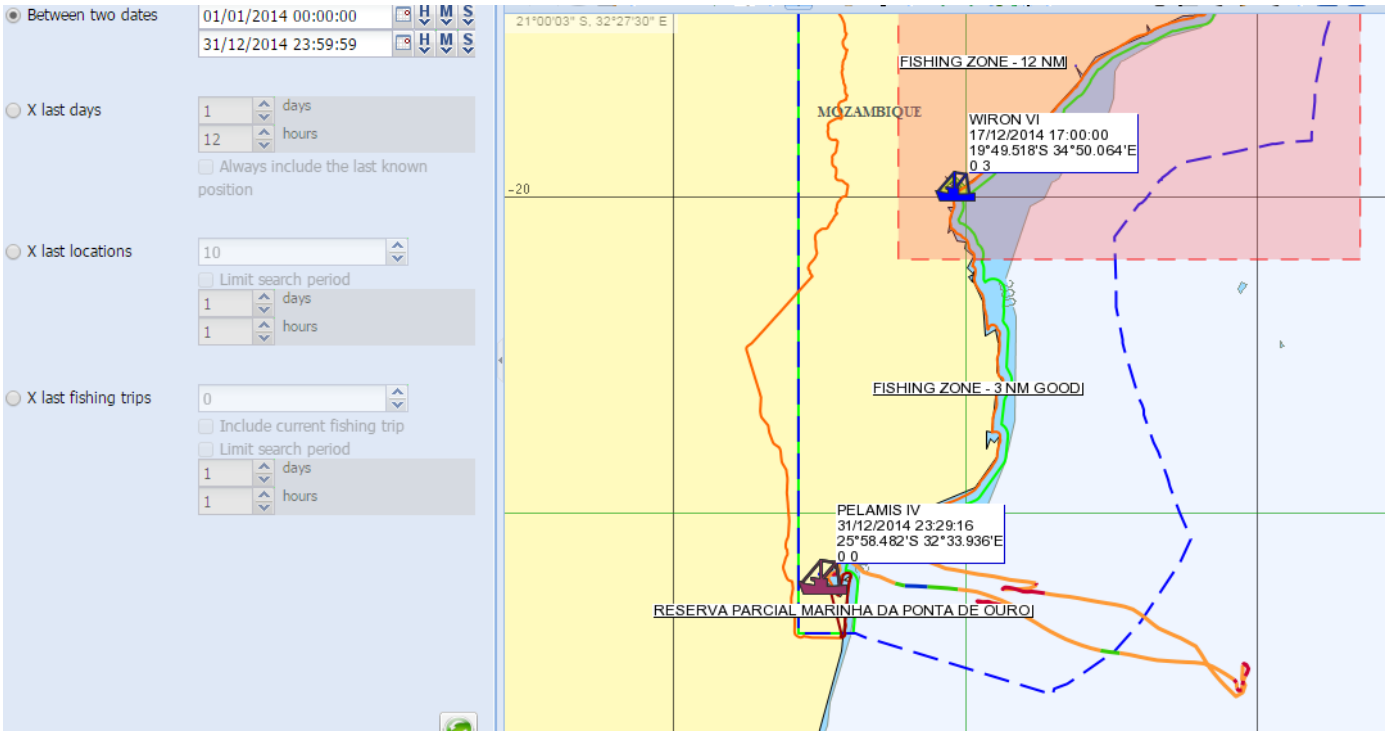
Between two dates
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31/12/2014 23:59:59
X last days
1 days
12 hours
Always include the last known position
X last locations
10
Limit search period
1 days
1 hours
X last fishing trips
0
Include current fishing trip
Limit search period
1 days
1 hours
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FISHING ZONE - 12 NMJ
MOZAMBIQUE
WIRON VI
17/12/2014 17:00:00
19°49.518'S 34°50.064'E
0 3
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FISHING ZONE - 3 NM GOODJ
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25°58.482'S 32°33.936'E
0 0
RESERVA PARCIAL MARINHA DA PONTA DE OUROJ

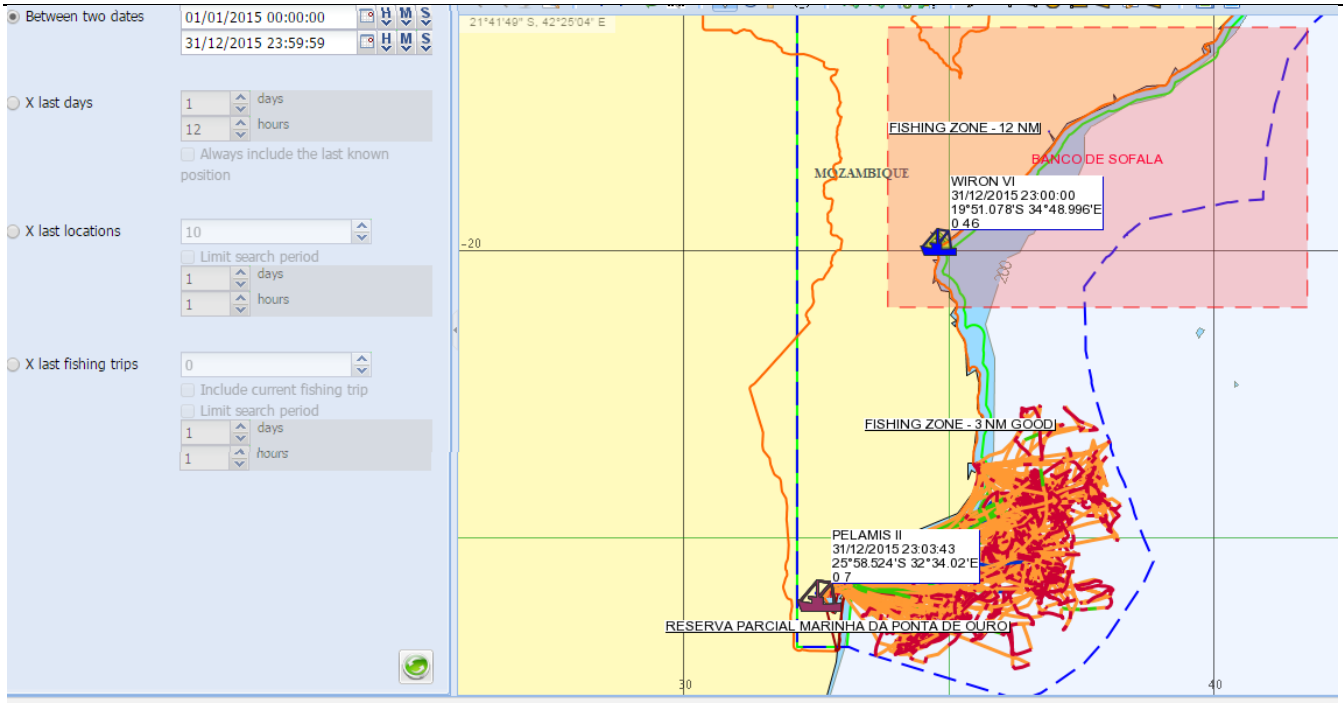

Figure 1a, b and c. Map of the distribution of fishing effort in 2013, 2014 2015, for the longliners fishing in the IOTC area of competence.
Figure 2a. Map of distribution of fishing catch, by species for the national fleet, in the IOTC area of competence (most recent year e.g. 2012). **Not available**

Figure 2b. Map of distribution of fishing catch, by species for the national fleet, in the IOTC area of competence (average of the 5 previous years e.g. 2008–2012). **Not available**

- **CATCH AND EFFORT BY THE ARTISANAL COASTAL FISHERIES**

The estimated catch of IOTC primary species by the artisanal coastal fisheries in 2015 was 4236 tons, a figure not different from 2014 (4443). The catch information for the coastal artisanal fisheries comes from six of the seven coastal provinces. The provinces with high contribution with tuna and tuna-like artisanal fisheries catch were Nampula (60%) and Inhambane (18%), followed by Cabo Delgado and Sofala with 8% each. However in terms of diversity of IOTC primary species it can be seen that the Northern provinces (Cabo Delgado and Nampula) are very important,

In general, the species that contributed more to the catch are namely, Narrow barred Spanish mackerel (47 %) and Frigate tuna (45 %) (Table 8).

Table 8 – Catch composition of artisanal fisheries by provinces

Species	Maputo	Inhabane	Sofala	Zambezia	Nampula	C. Delgado	Total by species
Narrow-barred Spanish mackerel	153,8	585,5	224,8	68,2	915,5	25,0	1972,9
Frigate tuna	0,0	183,1	138,4		1426,5	152,5	1900,5
Yellowfin tuna						12,7	12,7
Bigeye tuna					12,3		12,3
Albacore						1,8	1,8
Skipjack tuna						37,1	37,1
Kawakawa		2,0			169,1		171,2
Indo-Pacific sailfish							0,0
Blue marlin						61,5	61,5
Black marlin						65,8	65,8
Total by province	153,9	770,6	363,3	68,2	2523,4	356,3	4235,7

Table 9. Aggregated Annual Catch by primary species in the IOTC area of competence for artisanal coastal fisheries, **2010-2015**.

Species	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Yellowfin tuna	1	0	3	0	4	12,7
Skipjack	43	0	0	0	15	37,1
Bigeye tuna	321	26	2125	0	36	12.3
Albacore tuna	6	0	16	0	75	1,8
Black Marlin	0	0	0	10	66	66
Indo-Pacific Sailfish	0	0	0	0	16	0
Swordfish	0	0	0	0	0	0
Narrow barred Spanish mackerel	1676	690	2224	579	2623	1973
Striped marlin	11	0	0	0	0	0

Blue Marlin	28	0	0	0		62
Frigate tuna	2551	66	444	170	1598	1900
Kawakawa	125	3	567	121	10	171
Longtail tuna	125	0	0	0	0	0
Total catch in tons	4886	786	5378	880	4443	4236
Total fishing effort	Annual fishing effort not available					

REMARKS:

- ✓ **From 2010 to 2012:** The aggregated catch information in the table above is from five coastal provinces, namely Maputo, Inhambane, Sofala, Nampula and Cabo Delgado;

In 2013: The data are only for three provinces, Inhambane, Zambezia and Nampula;

In 2014: The data covers six provinces out of the seven coastal provinces.
In 2015: The data covers six provinces out of the seven coastal provinces

- **CATCH AND EFFORT BY THE SEMI-INDUSTRIAL LINEFISHERY**

The total catch of IOTC species (the narrow barred Spanish mackerel) in semi-industrial linefishery in year 2015 was 36 tons. This volume represented 5% of total catch of the fishery which target primarily on demersal rocky bottom fish. Despite the total fishing effort in 2015 was similar to 2014, the level of catch of Spanish mackerel dropped to 45% of the catch in 2014. This reduction is consequence of changes in fishing grounds from coastal areas to deeper reefs which is may be associated with overexploitation of coastal demersal fish.

Table 10. Aggregated Annual Catch and Effort by gear and primary species in the IOTC area of competence for semi-industrial linefishery (Only Narrow barred Spanish Mackerel), in 2013, 2014 and 2015.

	2013	**2014**	**2015**
Narrow barred Spanish Mackerel	150	80	36
Total fishing effort	4,100 days	4560 days	4536

4. RECREATIONAL FISHERY

The practice of recreational and sport fisheries is more active in the southern coast (21°S to 26°S) comprising the coast of Maputo province, Gaza province and Inhambane province.

In 2015, the monitoring program covered only two fishing competitions that took place in Maputo province (Ponta d'ouro) and Maputo City, with accounted a total catch of two tons. The most impacted IOTC species were Spanish mackerel and yellowfin tuna, mainly in Maputo province (figure 2; Table 11 and 12).

a) b)

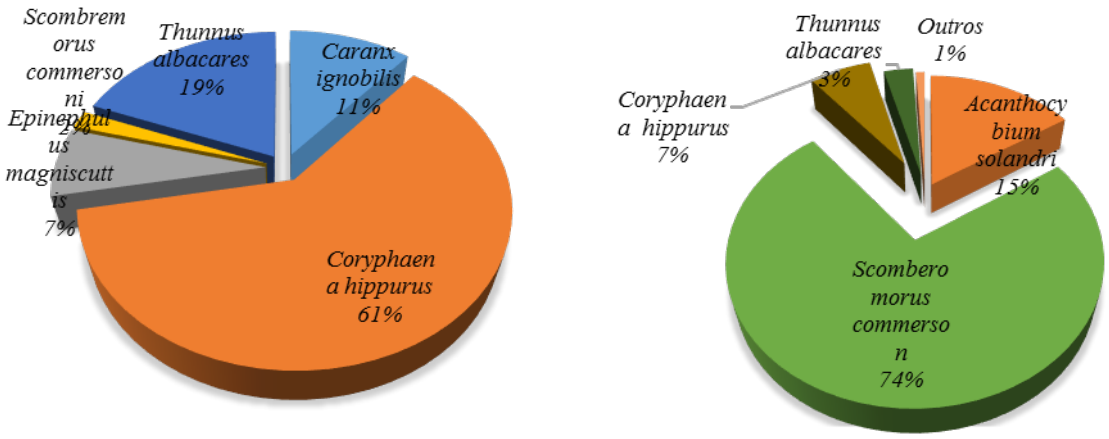

Figure 2: catch composition of sport fishing in Maputo city (a) and Maputo Province (b)

For the recreational fishing, voluntary submission of catch cards by recreational anglers (mainly on boats) occurred from 1996-1999 at Ponta d'Ouro and Ponta Malongane in the south coast, and commenced again in 2008 (with inclusion of Maputo, Gaza and Inhambane provinces). The cards are inconsistently completed by anglers, who use various common names of fish, and zero catches are not reported. Thus, the information for this fishery can just be considered available for Ponta d'Ouro and Malongane with consistent reporting in the last three years. In these specific places that are within a conservation area, the Marine Park officers were trained by IIP (Fisheries Research Institute) and a partnership was established to help in the collection of these cards. For the other areas the information of this fishery is unavailable. Beyond these difficulties, an internal discussion in the sector commenced to assess the measures that can be implemented in order to "force" the need of complying with data reporting by the recreational anglers. We expect to report development in this matter in the following reports.

However, Maputo has some reporting and the data are presented, by Maputo city and Maputo (Ponta d' Ouro). In Maputo city the total catch in 2015 (provided by one nautical club) was 2,239 kg which represents a drop of 8% relatively to the previous year. The catch composition was dominated by tuna species aggregated but it is believed that mostly are yellowfin (Table 11).

Table 11. Catch composition of recreational fishing in Maputo city (Provided by a nautical club).

Tuna	60%
Spanish mackerel	8%
Emperors	4%
Red fish	6%
Wahoo	5%
Carangids	3%
Groupers	7%
others	7%

In Maputo province the total catch in 2015 (provided by one nautical club) was 10787 kg which represents an increase of 10% relatively to the previous year. The catch composition was dominated by tuna species reported in aggregated but it is believed that it was mostly composed by yellowfin and Spanish mackerel (Table X).

Table 12. Catch composition of recreational fishing in Maputo province.

Tuna	40%
Spanish mackerel	23%
Marlin	2%
Bonito	6%
Dolphinfish	10%
Kakap	5%
Wahoo	5%
Others	9%

5. ECOSYSTEM AND BY CATCH ISSUES

No specific action plan was set and implemented yet. There are ongoing activities associated with the draft of the NPOA-Shark started in 2016. At this stage, a baseline assessment was performed and the relevant information of coastal, pelagic and demersal shark species along the Mozambican coast was gathered. The ongoing process is expected to be completed by the end of 2017. The new Law on Fisheries is already in force (Law No 22/2013 of November 01) in Mozambique and with a view of bringing the aspects that are in the Law there is an ongoing process of revising the fishing regulation. Thus, a paragraph that will define the obligation of vessels to comply with all IOTC resolution in regard to sharks, seabirds and sea turtles is going to be included in the revised regulation.

Moreover, Mozambique has developed in 2014, the Terms and Conditions of Licensing for tuna fishing and are attached to fishing license. These contain all the measures for the conservation and management of tuna fisheries and include the aspects related to conservation of sharks, seabirds and sea turtles.

5.1 Sharks

The lack of specific national strategies for sharks is still a challenge. However, in regard to the NPOA Shark specifically, drafting is ongoing since 2016 and the progress related to this action is as stated in the previous point 5 on ecosystem and by-catch issues.
Moreover, the country is supporting the listing of new species as protected, due to the risk from extinction, following the adequate assessment thought the CITES Commission at the national level.
The estimated annual shark's catches are presented bellow on table 10. The information is from the following fishing gears, beach seines, surface and demersal gill nets and hand line from Nampula and Zambézia provinces where the catch of sharks is high.

Table 13. Estimated catch (in tons) of sharks in artisanal fisheries of Zambézia and Nampula provinces in 2013, 2014 and 2015.

Shark species name	**2013**	**2014**
Sphyrna lewini	95.9	95
Sphyrna zygaena	211.7	4.6
Carcharhinus falciformis	1.8	
Carcharhinus leucas	201.6	135.2
Carcharhinus sealei	69.0	
Carcharhinus sorrah	24.9	
Carcharhinus limbatus	3.8	
Loxodon macrorhinus	26.3	0.6
Rhizoprionodon acutus	54.1	0.7
Hemipristis elongatus	14.5	2.634
Carcharhinus albimarginatus		5.2
Shark		10.2
Total	**703.7**	**253.9**

Recreational and sport fishery has practically null impacts on shark species. The artisanal fishery and semi-industrial linefishery impacts are under assessment linked to the preparation of the Mozambican NPO-Shark and the finds are expected to be presented in the next annual report. The impact of the recently introduced industrial longliners has been assessed and the results were presented in the WPEB with the paper with reference IOTC – 2015 – WPEB 11-45.

5.2 Seabirds

No NPOA is available for seabirds yet and non discussions are in place in this regard. However, Mozambique is regularly briefing the masters of their fishing vessel on the mandatory requirement to report any seabird interaction with longliner fleet and the scientific observers are responsible of reporting the interaction that they observer. Based on scientific observer data, a preliminary assessment of the impact of the longline fleet on seabirds was conducted and the results presented in the WPEB with the paper with reference IOTC – 2015 – WPEB 11-45, reporting null interaction with seabirds.

The actual longline logbook requires the skippers to fill in the information on interactions whenever it occurs. Recently, it was agreed at the national level to introduce in the national legislation all the requirements regarding seabirds conservation measures in the terms and conditions for licensing.

5.3 Marine Turtles

No specific strategy for marine turtles is available. However, Mozambican tuna longline logbook in use since 2012 include fields to capture information on interactions of the fishery with sea turtles. Based on scientific observer data, the interaction catch ratio was one turtle/7000 hooks deployed by the longline fisheries and the specimens are released alive in good state.

Sea turtles interaction with fisheries in Mozambique have been reported in the Sofala Bank trawlers since the onset of the fishery and the first attempt to quantify the level of incidental catch and mortality in this fishery was done by Gove et al., (2001). An interviews to "ice vessel" skippers based study concluded that sea turtle capture and mortality by the shrimp industry is a problem since every fishing season between 1,932 and 5,436 sea turtles were caught by this fleet and recommended that TEDs should be mandatory in the fishery. The re-design of the current maritime fisheries regulation, which was enacted in 2003 (Decree 43/2003) used those findings and the perception of at least part of the wider Sofala Bank operators and conservation organizations to make the use of TEDs mandatory by 2004.

A second interview based assessment was conducted by Brito (2012) Reporting that at least 1,735±1,235 sea turtles are caught each fishing season. Over 54.8% of the incidents occur within a few miles of the small islands forming the Primeiras and Segundas archipelago in the northern one fifth section of the Sofala Bank shrimp fishery.

Although there are known interaction between the artisanal fisheries and sea turtles, no actual studies are available to cite on the magnitude of these interaction along the coastal area.

5.4 Other ecologically related species (e.g. marine mammals, whale sharks)

The interaction of these species with the longline gear is null according to the scientific observer data.

Table 10. Observed annual catches of special species (seabirds, marine turtles and marine mammals) by gear in the national fleet, in the IOTC area of competence (for the most recent five years at a minimum, e.g. 2009–2015 or to the extent available).

No data available

6. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS

In Mozambique the collection of fisheries data and statistics is under mandate of the Ministry of Sea, Inland waters and Fisheries (MIMAIP). Within the Ministry the responsible Directorate is **DEPI** (Directorate of Studies, Plan and Infrastructures) which globalize and publish the data that includes catch and effort, and socio-economic data. There are autonomous institutions from this Ministry responsibly for collecting fisheries statistics. The institutions are: the National Fisheries Administration (ADNAP), the National Fisheries Research Institute (IIP), the National Institute for the Development of Fisheries and Aquaculture (IDEPA) (Table 14).

Table 14. Fisheries data collection in Mozambique: Institutions involved and categories of data collected.

Category of data	Artisanal fleet	S-industrial fleet	Industrial fleet	Recreational and Sport
Annual catches	IIP	ADNAP	ADNAP	ADNAP
Fishing craft statistics/ licences	IDEPA	ADNAP	ADNAP	ADNAP
Catch-and-effort data	IIP, IDEPA	ADNAP	ADNAP	ADNAP
Length frequency data	IIP	IIP	IIP	IIP
Observer trip report	IIP	IIP	IIP	IIP
Socio-economic data	IDEPA DEPI	DEPI	DEPI	DEPI

All fisheries except the artisanal subsistence fisheries (invertebrate collectors), are subjected to scientific monitoring programs implemented by the Fishery Research Institute ~~(IIP)~~. The on–board observer program is conducted in semi-industrial and industrial commercial fisheries. Artisanal fisheries are monitored by a National Stratified Random Sampling System locally known as SNAPA (Sistema Nacional de Amostragem da Pesca Artesanal). The number of artisanal gears available in all country and other social profile of the artisanal sector is assessed on a five year basis through a national census of the artisanal fishing by IDEPA (former IDPPE). Recreational fisheries are monitored by mean of outing cards. Sport fishing is

covered by on landing site sampling during the disembarkation on the local of the fishing completion and also by catch reports that the organizers provides to the fishing sector authorities.

The logbooks and other monitoring tools are also used as part of monitoring system (see table 12 below). These Logbooks are monitored by ADNAP which also issue the fishing licences. Nevertheless, the information from the logbooks is shared with IIP.
Despite a functional data collection system existing on National scale, it still not ~~very~~ effective to fulfil with the IOTC standards for data collection and reporting. Thus, to increase the level of compliance regarding the fisheries data and statistics, Mozambique started an internal reflection in regard to its institutional arrangement under the MIMAIP to better address the issues and guaranty effective collection of fisheries data. Within this process it was identified that the master plan of fisheries statistics needs to be revised and this task was planned to 2016.

6.1. **Logsheet data collection and verification** (including date commenced and status of implementation)

Longline Logbook compatible with IOTC requirement of data collection and reporting was developed by Mozambique in 2012 and its implementation started in 2014 in the national fleet. It allows collecting a wide range of information such as fishing positions (coordinates), catch by species and effort (hooks) per set and fishery interaction with protected species. The logbooks are provided to the vessels captains prior to the fishing activity and during this process captains are briefed on how to fill it correctly. Filled logbooks are returned back to the National Fisheries Administration (ADNAP) by the end of each fishing trip. The data verification process is carried out by ADNAP. After the verification of the information, ADNAP send a copy to IIP which use the relevant information for scientific advice on the exploitation activity.
Linked to this program, there is a national observer scheme that collection the scientific data as required by IOTC. See the summary in table 12.
Mozambique still faces difficult in terms of access to logsheet data of foreign fleet. The logbooks filled by EU vessels used to be received through the EU commission in Mozambique. However, this has not always been the case for some vessels. The EU fleet used also to report the catches through ERS system under FPA. The other foreign fleets outside of the FPAs send catch reports directly to ADNAP through entry exit reports.

6.2. **Vessel Monitoring System** (including date commenced and status of implementation).

The Ministry of Fisheries of Mozambique, recognizing the Vessel Monitoring System - VMS as important tool for MCS contracted a VMS provider in 2001. Nevertheless, the system was not working properly due the lack of assistance to the installed equipment. Thus, the Ministry decided to look for a new provider. So in 2010 was developed the current system which became fully operational in 2011 covering national fisheries and also foreign tuna fleets

through the communication protocol established. The system was running in META software and it is installed in Maputo at National Fisheries Administration – ADNAP. In 2012, the VMS was upgraded from META software to THEMIS software with the aim of having a multifunctional system.

The THEMIS software was proved to be better because it allows the vessels monitoring and produce reports containing the required information on vessel location (position), velocity, date, time and direction. It also allows exchange of information with other FMCs, and will allow integrating ERS in VMS, and receive information from Orbcomm and AIS Satellite providers.

Linked to the above action, training of personnel in the use of the tools of the THEMIS software was carried out.
The implementation of the VMS has been providing positive results such as detention of illegal fishing vessels, location of the vessels for conflicts resolution propose, control of the entrance and exit of authorized foreign fishing vessels in the Mozambican EEZ.

In the 2015, the VMS was expanded to cover all semi-industrial fleet small scale national fleet to allow an effective operational VMS Centre. The other challenge is to incorporate catch report and ERS in VMS to allow cross check and better analysis.

6.3. **Scientific Observer programme and Port sampling programme** (including date commenced and status; number of observer, include percentage coverage by gear type).

For industrial fisheries (shallow water shrimps and linefishery), Scientific Observer programme has been carried out since the 1980s. It has been also implemented on the national flagged tuna longliners since 2012 (Table 12).
For artisanal fisheries a sampling program was developed in 1997. Initially on experimental basis and of gradual implementation. The system was expanded and became adopted as the official source of artisanal fisheries statistics of Mozambique. The system is based on a random-stratified sampling at landing sites defined as fishing centres. The Data collected include catch by species, effort and length of dominant species. Not all fishing centres are sampled. The geographical extension and complexity of the artisanal sector, which primarily do not target on IOTC species, associated with logistical (financial) limitations for implementation of the sampling system are the primary causes affecting the effectiveness of data collection of artisanal fisheries.
The recreational fishing is the less monitored fishery (Table 15). IIP distribute fishing catch cards to many lodges and hotels were recreational fishing is a current activity but the level of return of these card is very low. The cards were supposed to be filled per outing but the operators normally says that tourist fishers do not accept or they forget to fill the cards.

Mozambique is committed with IOTC initiatives in this field and will improve the ability of the country to carry out scientific monitoring of tuna. The Fishery Research Institute has eight scientific observers who have been trained under the SWIOFP and have the respective registration and certification. Most of these observers are above 45 years of age what poses a

challenge to IIP in training new people who will answer to future challenges. A course for training new scientific observer for tuna fisheries has been planned for 2016 in Mozambique.

Table 15. The coverage of Mozambican fisheries with potential impacts on IOTC mandatory species by the scientific observer program under the Ministry of Fisheries (IIIP/ADNAP).

Fishery Sector and fisheries	On-board Sampling (%)	Port Sampling (%)	On landing site Sampling (%)	Logbooks (%)
1. Artisanal	NA	NA	Yes	No
1.1. Beach seine	NA	NA	1-5%	0%
1.2. Handlines	NA	NA	1-5%	0%
1.3. Gillnets	NA	NA	1-5%	0%
1.4. purse seines	NA	NA	1-5%	0%
1.5. longlines	NA	NA	1-5%	0%
1.6. other gears	NA	NA	1-5%	0%
2. Semi-industrial	Yes	Yes	NA	Yes
2.1 Linefishery	3%	10%	NA	80%
3. Industrial	Yes	No	NA	Yes
3.2. Linefishery	10%	0%	NA	100%
3.3. Pelagic longline	20%	0%	NA	100%
4. Recreational & sport	NA	NA	Yes	Yes
4.1. Recreational fishing	NA	NA	1%	1%
4.2. Sport fishing	NA	NA	2%	30%

6.4. Length data

Table 16 shows the length data collected in the fisheries which potentially impact on IOTC species.

Table 16. Number of individuals measured by species and fishery in 2015.

Fisheries	Species	Number sampled	Observation
Artisanal coastal fisheries	All IOTC mandatory species	0	The sampling system of artisanal fisheries was designed to collect data of the main species (coastal) that support the fishery (mainly small pelagic and demersal species). Although catch data are recorded for all species including IOTC mandatory species, size measurements for IOTC species is not taken by artisanal sampling system. Recognizing that this is a sector with a potential impact on many of the IOTC species, IIP is currently studying alternative approaches to collect such type of data. A pilot project in Nampula and Cabo Delgado to improve the quality of data collected and reported to the

			IOTC, including size frequency data, was initiated in 2015.
Semi-industrial Linefishery	Narrow-barred Spanish mackerel	36	Narrow-barred Spanish mackerel is unique IOTC species captured in this fishery. Despite targeting primarily on demersal species, Spanish mackerel has a significant contribution on total production of linefishery and thus biological data such lengths are collect by mean of observer on board. Other IOTC species (tunas, billfish, pelagic sharks, marine turtles, birds and mammal) are not impacted by the fishery.
Sport fishery (Linefishery)	Black Marlin	1	Data refer to on landing site sampling in or out of some fishing tournaments in the southern part of Mozambique (Maputo province in 2014). Collection of recreational fishing data is very difficult as the cards distributed by IIP to the many lodges along the coast are not filled by the amateur fishers. IIP is currently studying alternative approaches to collect such type of data. This action did not produce results yet.
	Yellowfin tuna	867	
	Skipjack tuna	133	
	Albacore	0	
	Bigeye tuna	0	
	Frigate tuna	0	
	kawakawa	23	
	Indo-pacific Sailfish	3	
	Spanish mackerel	416	
	Longtail tuna	9	
Industrial Longline Fishery	Swordfish	359	Data collected thought scientific observers on-board
	Striped marlin	12	
	Blue marlin	5	
	Black marlin	2	
	Bigeye tuna	140	
	Yellowfin tuna	138	
	Albacore	9	
	Skipjack tuna	1	
	Blue shark	34	
	Dusky Shark	28	
	Shortfin mako	14	
	Oceanic whitetip shark	9	
	Scalloped hammerhead	4	
	Silky shark	1	
	Thresher shark	1	

6.5. Unloading/Transhipment [including date commenced and status of implementation]
No transhipment

7. NATIONAL RESEARCH PROGRAMS

The Fisheries Research Institute (IIP), under the Ministry of Sea, Inland Waters and Fisheries, has the mandate of undertaking research in fisheries related issues as well as the aquatic environment and aquaculture. The IIP does not possess a research vessel what is a challenge to carry out its mission. However, several research on demersal fish, small and large coastal pelagic fish, squids and octopus, bivalves, shallow water shrimp, rocky lobsters and oceanographic research are ongoing with collaboration of fishing industry and financial support from Government, World Bank project, IFAD and other. Recently, the tuna fishery development plan was completed and approved by the cabinet and it is under implementation.

In the framework to improve the quality of artisanal fisheries data collected and reported to the IOTC for full compliance with the resolution 10/02, we conducted, in 2015, a pilot assessment of SNAPA, in two provinces (Cabo Delgado and Nampula) where artisanal fisheries shows significant catches of tuna species and billfishes. With this assessment, it was concluded that the National Sampling System for Artisanal Fisheries (SNAPA) is suitable to be the primary source of data required by IOTC under the resolution 10/02 da IOTC. However, to guarantee full compliance with IOTC requirements regarding data collection and reporting for artisanal fisheries some arrangements needs to be implemented. The problems raised during the assessment were, low level of sampling coverage on active gears and catches; week capacity of enumerators to discriminate correctly IOTC species at species level (tuna and billfishes) and none sampling of size data of IOTC species. Based on the above findings, it was proposed recommendations and an action plan to improve the level of data collection and reporting to IOTC regarding the artisanal fisheries in these two provinces, on the view to expand the same initiative to other coastal provinces.

Table 17. Summary table of national research programs, including dates.

Project title	Period	Countries involved	Budget total	Funding source	Objectives	Short description
Implementation of the recently approved linefish management plan	2014-2018			Mozambique Government	Guarantee the sustainability of fishery by using an ecosystem approach	A plan to develop a NPOA sharks is under this management plan
Demersal fishery potential	2012-2015			IFAD	Assess the fishing potential accessible to small scale fishers	
Small and large coastal pelagic fish fishery potential	2012-2015			IFAD	Assess the fishing potential accessible to small scale fishers	
Octopus fishery potential	2012-2015			IFAD	Assess the fishing potential accessible to small scale fishers	
Implementation of FADs for the small scale coastal fishers	2012-2015			IFAD	Improve the use of FADs as an option to increase the income of the smaller fishers	
Pilot project to improve the quality of data collected and reported to the IOTC regarding the artisanal fisheries	2015-2016			WWF	improve the quality of data collected and reported to the IOTC regarding the artisanal fisheries which impact on IOTC species in Nampula and Cabo Delgado provinces	

8. IMPLEMENTATION OF SCIENTIFIC COMMITTEE RECOMMENDATIONS AND RESOLUTIONS OF THE IOTC RELEVANT TO THE SC.

Table 15. .Scientific requirements contained in Resolutions of the Commission, adopted between 2005 and 2016.

Res. No.	Resolution	Scientific requirement	CPC progress
15/01	On the recording of catch and effort by fishing vessels in the IOTC area of competence	Paragraphs 1–10	Mozambique has developed and implemented since 2013 the national tuna longline logbook that captures all required information stated in this resolution. However, an improvement of the longliner logbook shows necessary to strengthen the reporting standards.
15/02	Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)	Paragraphs 1–7	Mozambique submitted the mandatory statistics for the national fleet as stated in the resolution requirements within deadlines. Moreover, continuous interaction with the secretariat exists to clarify any matter related to the data.
15/05	On conservation measures for striped marlin, black marlin and blue marlin	Paragraph 4	Mozambique has no gillnet fisheries impacting on marlin species.
13/04	On the conservation of cetaceans	Paragraphs 7– 9	Mozambique has no purse seine fleet. Additional according to the national legislation the cetaceans are protected species. In the longliners, no interaction with cetaceans was observed.
13/05	On the conservation of whale sharks (*Rhincodon typus*)	Paragraphs 7– 9	Mozambique has no purse seine fleet. Additional according to the national legislation the cetaceans are protected species. In the longliners, no interaction with cetaceans was observed.
13/06	On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries	Paragraph 5–6	Mozambique is addressing the issue of recording the incidentals catches and live releases of the oceanic whitetip. Fishing masters are continuously encouraged to record and report on this species of shark during the pre fishing briefing. Also, this resolution is included in the Terms and Conditions for Tuna License. Moreover, the observer scheme captures the data on this species.
12/09	On the conservation of thresher sharks (family alopiidae) caught in association with fisheries in the IOTC area of competence	Paragraphs 4–8	Mozambique is addressing the issue of recording the incidentals catches and live releases of sharks of the species *Alopia* spp. Fishing masters are continuously encouraged to record and

Res. No.	Resolution	Scientific requirement	CPC progress
			report on these species of sharks during the pre fishing briefing. Also, this resolution is included in the Terms and Conditions for Tuna License. Moreover, the observer scheme captures the data on this species. Recreational and sport fishing have no impact on thresher sharks.
12/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraphs 3–7	Mozambique reported that there have been no interactions with seabirds reported, based on the longline logbook and the observer scheme observations in 2015. Mozambique is regularly briefing the master of the vessels on the mandatory requirement to report all interactions with seabirds. Also, this resolution is included in the Terms and Conditions for Tuna License.
12/04	On the conservation of marine turtles	Paragraphs 3, 4, 6–10	Mozambique reported that there have been no interactions with marine turtles reported, based on the longline logbook. However, additional information from the observer scheme observations in 2015, show that there are fewer interaction with these species.
11/04	On a regional observer scheme	Paragraph 9	In 2015, seven on board trips by observer where conducted, corresponding to a coverage level of 20%. The observers data is attached to this report.
05/05	Concerning the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 1–12	The Mozambican sharks' catches were reported in the 2015 within the deadlines. However, the logbook still needs improvements to better capture the information at the species level.
16/06	On measures applicable in case of non-fulfilment of reporting obligations in the IOTC	Paragraph 1	Mozambique made effort to increase the number of on board obervers trips; improved the Terms and Conditions for Tuna License; Implemented pilot project to assess the costal tuna fisheries; the IOTC resolutions have been included in the TCT and updated regularly.

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