Mozambique National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2019

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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**.	YES The data from Industrial Mozambique tuna fleet, semi-industrial linefishery and artisanal fishery were sent, to the IOTC secretariat on 28th June 2019. 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. **REMINDER:** Final longline data for the previous year is due to the IOTC Secretariat by 30 Dec of the current year	YES Mozambique has submitted the preliminary data of longline fleet of the year 2017, to the IOTC secretariat on 28th June 2019. The final longline data are partially reflected in this report. Regardless of that, Mozambique will submit the final data formally to the secretariat before the deadline of 30 December 2019.
If no, please indicate the reason(s) and intended actions:	

Executive Summary

The present report is an update of all activities, at national level, related to fisheries and species under IOTC mandate, including fisheries statistics, management and research activities. In the year 2018 the total catch of IOTC species within Mozambique EEZ was 7583 tons of which 37% came from Foreign fleet and 63% came from domestic fisheries.
The total catch of distant water fishing nations composed of 32 longliners and four purse seiners in 2018, estimated at 2805 tons, was similar to the previous year figure. Yellowfin represented 56% of the catch followed by bigeye 13% and swordfish 7%. Shark species reported by this fleet represented about 1% of total catch, composed by blue shark.
The national industrial tuna fleet licensed two longline vessels, which produced a total catch of 135 tons (3% of the total domestic production for IOTC species). Compared to the catch of the year 2017 the production achieved by this fleet represented a signigficant redution of -47%. Cathes composition were dominated by yellowfin (46%) and swordfish (34%) acompanished by bigeye and dourado with 6% each. Sharks were not retained by this fleet with all being safe realised. The semi-industrial linefishery fleet of 33 vessels (14m-19m LOA) targeting primarily rocky bottom demersal fish, landed about 90 tons Narrow-barred Spanish mackerel, representing 2% of the domestic catches of IOTC species . The multi-gears and multi-species artisanal sector landed 4513 tons of IOTC primary species, contributing with 94% of total IOTC species domestic landings. The 2018 prodution of this sector represented a slight reduction of -6% compared to the catch of IOTC species in the year 2017. Catch composition was dominated by Narrow-barred Spanish mackerel (37%) and by frigate and bullet tunas with 44% followed by kawakawa 14%. The capture of sharks (IOTC and non IOTC sharks) by this sector is considerable and in the year 2017 was estimated at 2336 ton of which hammerhead sharks represented 71%. No update was made in 2018. The recreational and sport fishing sector, which also catches IOTC primary species, issued 3343 individual licenses in 2018. Similarlly to previous years about 90% of the licenses were issued in the southern coastal provinces where the activity is more intense. The total catch of IOTC primary species by this sector was roughly estimated around 39 tons in 2018. Data collection and reporting of fisheries statistics for this sector, including the nominal catch, is still a challenge.
To improve the knowledge about the dynamic of tuna fisheries, some tools and programs have been implemented at national level. A logbook system is in place for industrial and semi-industrial fleet and scientific observers have been regularly embarked on-board the fishing vessels. In 2018, 16 % of the total fishing days were covered by scientific observers on-board national longline vessels. Improvements in the observer program are being expected in the following years as Mozambique is willing to participate in the pilot project on regional observer scheme. For artisanal fisheries, a landing sampling scheme is in place and to continue improving the coverage and the quality of fisheries data, there are ongoing activities which include a pilot implementation of the *FAO ARTFISH data collection framework*. With respect to sharks, in 2018 Mozambique continued with elaboration of the NPOA-sharks, with a first draft to be delivered in 2019 throuthout a coolaboration between Mozambique government and WWF, WCS, TRAFFIC and other national agencies. For the recreational fisheries, a comprehensive update of the recreational fisheries census conducted in 2008 is planned for year 2019 in order to fill the gaps and improve the knowledge on the dynamic of the fishery.

Contents

1. BACKGROUND/GENERAL FISHERY INFORMATION

Mozambique is located in the south-eastern Africa, between latitudes 10°27'S to 26°52'S and longitudes 30°12'E and 40°51'E. The country has a coastline of approximately 2,700 km, a total continental shelf area of about 104,300 km^2 and an EEZ area of 999, 000Km^2. The coastal area of Mozambique covers seven different provinces and it is normally divided 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 (including part of Nampula province, the Zambézia 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. Fishing activity takes place along the entire coast, although the main and more productive fishing area for the national fishing fleets is the Sofala bank.

The fishing sectors operating along the coastal areas of Mozambique are the artisanal, the semi-industrial, the industrial and the recreational and sport sector.

The artisanal fishing sector has particular importance for the country´s food security. Artisanal fisheries are spread out along the marine coast of all coastal provinces, where two thirds of the population live, and also in the inland areas, where around 25% of the artisanal fisheries catch comes from. The total catch from artisanal marine sector, is around 200,000 tons/year, and represents around 70% of the total catch of the country. The fisheries usually takes place from beaches or near coastal waters (generally within 3 nautical miles) using canoes and small motorized boats less than 10 m in length. Fishing operations are conducted with a wide range of gears, including beach-seines, hand-lines, gillnets, small purse seines and longlines. The artisanal fleet 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 and small demersal species. Tuna and tuna like species represent a small portion of the catch (less than 3%), with Narrow-barred Spanish mackerel being the main species landed from this group.

The industrial fishing sector is dominated by *shallow water shrimp trawling* and *the deep water crustaceans trawling* with almost no impact on tuna and tuna-like species. Interactions with marine turtles are the unique concern of the shallow water shrimp trawling. The national longline tuna fishery is on it incipient phase, and despite having currently 12 vessels registered, the fleet is still facing operational problems. However, with the commitment of Mozambique government in promoting the implementation of the Tuna Fishery Development Plan (PEDPA), a rapid growth of the national tuna oriented industrial sector is expected in the coming years.

The semi-industrial sector is characterised by vessels between 10 to 20 m in size. It is sub-divided in shallow water shrimp trawling and linefishery. In this Sector, the fishery with a potential impact on IOTC primary species is the linefishery which target primarily rocky bottom fish (demersal species), but actually has the narrow-barred Spanish mackerel, as the only IOTC captured species.

The practice of Recreational and Sport fisheries is more active in the southern coast (21°S to 26°S). Operations takes place from the shore or are boat based, using tod and reel. Tuna and tuna-like species are captured on boat based operations (fibreglass ski boat; 3-9m length), being particularly target species within fishing tournaments.

On general, species under the IOTC mandate may be more or less impacted by all fisheries sector in Mozambique. However, fisheries that directly target on IOTC primary species are the industrial tuna longline fishery and Sport fishery.

2. FLEET STRUCTURE

Foreign Distant Waters Fishing Nations are the main group historically fishing tuna and tuna-like species in the Mozambique fishing area. The number of foreign fishing vessels licensed during 2018 for the Mozambican fishing area 36, comprised by 32 longliners (Japan, South Korea and) and 4 purseiners (Seychelles) (Table 1).

Table 1. Number of fishing licenses issued to foreign vessels to fish in the Mozambican fishing area, during the last ten years: 2007 to 2018 (Source: ADNAP 2007 to 2018 annual reports & MIMAIP, 2017 and 2018).

Year	Nº licenses	
	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	26
2016	7	29
2017	4	33
2018	4	32

The national Industrial tuna fishery 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 (Table 2). In 2015 other seven boats were introduced increasing the fleet to a total of nine longliners licensed (Table 2). In 2016 all these vessels remained non-operational aside three which operated during the first quarter (three licenses), while two new vessels were registered and licensed and operated throughout the year (Table 2). In 2017 and 2018 only two national longliners were licensed.

Table 2. Number of fishing licenses issued to National Longline vessels from 2014 to 2018.

Year	Longline Licenses
2014	2
2015	9
2016	5
2017	2
2018	2

The Recreational and sport fishing, other sector that target on IOTC primary species, in 2018 issued 3343 licenses for coastal provinces operators (preliminar information Jan-September). From the table 3, it can be seen that the main area for recreational operations is the southern coast (Maputo, Gaza and Inhambane) with above 90% of the licenses issued.

Table 3. Number of recreational licenses (Recreational and Sport fishing) issued for coastal provinces by ADNAP from 2011 to 2018.

Year	Cabo Delgado	Nampula	Zambezia	Sofala	Inhambane	Gaza	Maputo	Total
2011	189	20	14	55	875	523	1,241	2,728
2012	161	0	6	62	702	390	1,581	2,741
2013	306	24	10	46	922	542	1,702	3,552
2014	201	27	2	110	2,008	361	2,144	4,853
2015	174	78	0	67	1,844	396	1,893	4,452
2016	137			69	1,370	839	2,058	4,473
2017	155	19	25	82	2105	844	1,900	5130
2018	20	11	54	45	1511	557	1145	3343

The gears, vessels size and duration of fishing operation by the artisanal, recreational and sport, semi-industrial and industrial fisheries fleet are described below in the Table 4.

Table 4. Summary description of vessel types and gears by fishery sector with impact on IOTC species, operating along the Mozambican coast.

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. About 50% 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 for catch conservation or iced catch (1
	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	

				day trip maximum).
Recreational and sport fishing No accurate data is available; around 50 boats operate annually	N/A	N/A	Rod + line	The recreational involves a large number of people fishing demersal and pelagic linefish as leisure. Operations takes place from shore or boat based. The sport fishing is more organised. The fishers belong to a club that normally sets standards for fisher ethics and organises tournaments. The catch is composed by pelagic species (Billfishes, tropical tunas and Spanish mackerel). Operations are boat based. A large number of recreational and sport fishers are foreign.
	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 Demersal rocky 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.

The annual fishing licenses by gear by fishery sector are described in the Table 5, bellow.

Table 5. Summary of fishing licenses by gear issued for artisanal fishery, semi-industrial, Industrial, recreational and sport fishery in the last years. Source: ADNAP annual reports, for all fisheries except for artisanal that information is provided by IDPPE, 2012.

Fishery sector	*Gear*	*N# licenses 2013*	*N# licenses 2014*	*N# licenses 2015*	*N# licenses 2016*	*N# licenses 2017*	*N# licenses 2018*
Artisanal							
	Beach seine	*9,916*	*9,916*	*9,916*	*9,916*	*9,916*	*9,916*
	Handlines	*13,853*	*13,853*	*13,853*	*13,853*	*13,853*	*13,853*
	Gillnets	*20,396*	*20,396*	*20,396*	*20,396*	*20,396*	*20,396*
	Longlines	*1,077*	*1,077*	*1,077*	*1,077*	*1,077*	*1,077*
	Purse seine	*563*	*563*	*563*	*563*	*563*	*563*
Semi-industrial							
	Sofala bank Shallow water shrimp	*22*	*23*	*20*	*16*	*21*	*37*
	Linefishery	*40*	*34*	*40*	*30*	*33*	*37*
Industrial							
	Sofala bank Shallow water shrimp;	*44*	*35*	*41*	*43*	*40*	*42*
	Pelagic longline tuna	*0*	*2*	*9*	*5*	*4*	*2*
Recreational & sport							
	Coastal provinces Recreational and sport fishing	*3,552*	*4,853*	*4,452*	*4,473*	*5180*	*3343*

- **Comments on artisanal fisheries**

Information based on census (frame survey) of artisanal fishing (IDPPE 2012) which is updated on a 5 year basis. 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

- CATCH AND EFFORT BY THE DWTFN

The Mozambican fishing zone is assessed by the foreign vessels primarily in a seasonal base, May to November for longliners and February to Abril for purse seiners. The estimated total catch of DWTFN operating in Mozambique waters in 2018 accounted to 2805 tons which represents a similar figure of 2017 (just a slight increase of +2%)(Table 6). The IOTC primary species represented 89% of the total catch composition of foreign fleet in 2018 which was dominated by yellowfin tuna with 56% of total catch. The bigeye tuna contributed 13%, swordfish with 7% and albacore with 6%. In general, the catch composition pattern remains the same as in the previous years (Table 6). The only shark reported by tis fleet was blue shark wich represented 1%.

Table 6. Annual catch of the IOTC species in tons and fishing effort in fishing days of DWTFN in Mozambican fishing area from 2010 to 2018.

Species	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Albacore	248	663	114	229	212	-	203	108.7	167.3
Bigeye tuna	274	387	154	257	361	231	257	254.8	376.2
Yellowfin tuna	1,613	2,280	890	2,096	2,275	2,237	2,018	1,787.5	1,583.9
Skipjack tuna	2,345	1,162	249	21	12	118	67	80.3	8.4
Swordfish	837	463	920	590	205	112	214	185.3	205.3
Striped marlin	-	-	-	-	-	44	78	62.9	39
Blue marlin	-	-	-	-	-	14	50	3.9	13.8
Black marlin	-	-	-	-	-	86	60	43.3	36
Indo-pacific Sailfish	-	-	-	-	-	45	32	30.8	24.2
Shortbill spearfish	-	-	-	-	-	-	13	0.8	0.74
Blue shark	-	-	-	-	-	-	73	0	66
Porbeagle	-	-	-	-	-	-	4	0.8	-
Hammerhead	-	-	-	-	-	-	-	0	-
Others	603	465	99	448	-	190	240	169.2	283.8
Total catch (tons)	6,640	5,925	2,426	4,149	3,065	3,079	3,249	2,728	2805
Effort (days)	2,727	2,412	1,551	1,734	2,215	2,229	2,238	1,636	2063

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

The national longline tuna fleet production in 2018 was 135 tons representing an redution of -47% compared to the catch of the year 2017 (Table 7). The IOTC primary species represented 93% with the most important species in terms of weight being yellowfin tuna (46% of total catch) and swordfish (34 %) followed by bigeye tuna and dourado (6% each) (Table 7). Sharks were not retained by this fleet with all being safe realised aside for a small retention of blue shark (0,1%)(Table 7). The fishing effort in 2018 was estimated at 202281 hooks deployed, which is an redution of -28% compared to the fishing effort of 2017.

Table 7. Annual catch of the IOTC species (tons) and fishing operations (cumulative fishing days) for the national longline fleet.

	year 2014	years 2015	Year 2016	Year 2017	Year 2018
Southern Bluefin tuna	0	0	2	0.085	0
Albacore	0	3.7	0.3	0.84	0.675
Bigeye	0.8	33.6	15	23.5	8.2
Yellowfin tuna	1.4	51.3	21	88.8	62.6
Skipjack tuna	0	1.8	4	0	0
Swordfish	3.3	73	36	73.5	45.6
Striped Marlin	0	0.15	6	4.8	0.5
Blue Marlin	0	1.7	4.2	6.2	2.8
Black Marlin	0	8.5	10	2.7	2.7
Indo-pacific Sailfish	0	290	6	3.2	2.5
Short Bill spearfish	0	6.1	1.5	0.84	1
Blue shark	-	10.7	0.7	0	0.1
Hammerhead Sharks	-	1.5	-	0	0
Mako Sharks	-	1.5	-	0.055	-
Other sharks id.	-	-	-	36	-
Others	2	13.8	10.6	16	8.6
Total Catch (tons)	7.5	217.5	117	256.4	135.2
Total Effort (days)	6	310	-	190	
Total Effort (hooks)			230296	284,369	

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

The estimated catch of IOTC primary species by the artisanal coastal fisheries in 2018 was 4513 tons, -6% bellow the catch of the year 2017 (Table 8). Catch composition was dominated by Narrow-barred Spanish mackerel (37%) and by frigate and bullet tunas with 44% followed by kawakawa 14%. Gears contributions analysis showed small purse seine (47%) and handline (32%) as the most important gears targueting IOTC species followed by beach seine (12%) and gillnets (8%). Analisys of spatial contribuition made in the previous years including 2017 showed that Cabo Delgado, followed by Nampula and Inhambane are the provinces with major diversity of IOTC primary species while other provinces catch mainly Narrow-barred Spanish mackerel.

Table 8. Catch composition of IOTC primary species in artisanal fisheries by gear in 2018.

Fishery	Bigeye	Frigate and bullet tuna	Kawa-kawa	NBS mackerel	Skipjack	Slender tuna	yellowfin	Albacore	Marlins	**Total**
Beach seine	0	489,21	0	69,05	0	0	0			558,26
Gillnet	0	125,28	48,92	184,07	0	1,96	0			360,23
Smalll longline	0	0	0	24,35	0	0	0			24,35
Handline	0	93,26	48,9	1100,71	45,07	44,06	91,77	15,52	24,44	1463,73
Small purse seines	16,53	1262,36	534,97	269,73	18,29	0	0			2101,88
Harpoon	0,5	0	0	0	0	0	0		4,34	4,84
Total	17,03	1970,11	632,79	1647,91	63,36	46,02	91,77	15,52	28,78	4513,29

Table 9. Aggregated Annual Catch in tonnes of IOTC primary species by artisanal coastal fisheries (2012-2018).

Species	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Yellowfin tuna	3	0	4	12.7	170	79.5	91.8
Skipjack tuna	0	0	15	37.1	15	49.3	63.4
Bigeye tuna	2,125	0	36	12.3	38.4	27.6	17
Albacore	16	0	75	1.8	0	0	15.5
Marlins nei.	-	-	-	-	-	123.3	28.8
BlackMarlin	0	10	66	66	-	-	-
Indo-Pacific Sailfish	0	0	16	0	3	11.7	-
Swordfish	0	0	0	0	1	0	-
Narrow barred Spanish mackerel	2,224	579	2,623	1,973	2,513	3513.1	1648
Kanadi Kingfish	-	-	-	-	-	26.8	-
Slender tuna	-	-	-	-	-	-	46
Striped marlin	0	0	0	0	0	-	-
Blue Marlin	0	0		62	64.3	-	-
Frigate and bullet tuna	444	170	1,598	1,900	882	950.1	1970
Kawakawa	567	121	10	171	26.6	39.5	632.8
Longtail tuna	0	0	0	0	1.5	0	0
Total catch	5,378	880	4,443	4,236	3,715	4,821	4513
Total fishing effort in 2017 by fishing gear	Beach Seine=643,538 sets; Gillnet=645,150 sets; Handline=536,807 boat days; Spearfishing=18,085 gear days; Longline=5,506 gear days; Seine nets = 42,041 boat days.						

REMARKS:

- **2010 to 2012:** The aggregated catch information in the table above is from five coastal provinces, namely Maputo, Inhambane, Sofala, Nampula and Cabo Delgado;
- **2013**: The data are only from three provinces, Inhambane, Zambezia and Nampula;
- **2014 to 2018:** 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 2018 was 90 tons, 50% of increase compared to previous year. The annual variation of narrow-barred Spanish mackerel catch in this fishery is mainly explained by the fact of the fishery is oriented to primarily target demersal rocky bottom fish.

Table 10. Aggregated Annual Catch in tons and Effort in fishing days by gear and primary species for semi-industrial linefishery (Only Narrow-barred Spanish mackerel), 2013-2018.

Narrow-barred Spanish Mackerel	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Total Catch	150	80	36	83	60	90
Total effort	4,100	4,560	4,536	4,656	3,675	4224

4. RECREATIONAL AND SPORT FISHERY

The practice of recreational and sport fisheries is more active in the southern coast (21°S to 26°S) where 90% of the licenses are issued annually, covering the coast of Maputo (34%), Gaza (17%) and Inhambane provinces (45%).

In 2018, the monitoring program covered the Maputo province (Ponta d'ouro). The most targeted species were yellowfin tuna with 31% and the narrow-barred Spanish mackerel 23% as described in Table 11 bellow.

Table 11. Catch composition (in tons) of IOTC primary species by recreational fishing in Maputo Province.

Yellowfin tuna	Kawakawa	Skipjack tuna	Narrow-barred Spanish mackerel	Total
1	0.05	0.179	2.6	3.3

The number of licenses issued for Ponta d'ouro represents rough estimative of 25% of the total licenses for Maputo province. Based on this assumption and the number of licenses issued, it is estimated at a total annual catch of 39 tons for all country. A comprehensive update of the year 2008 recreational fisheries census is planned to be undertaken next year (2019) in order to fill the gaps and improve the knowledge on the dynamic of this fishery.

5. ECOSYSTEM AND BY-CATCH ISSUES

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. The key IOTC resolutions regarding conservation of sharks, seabirds and sea turtles were transposed to the regulation with support of an external consultant supported by the IOTC. The regulation is under consultation and discussion with stakeholders at national level and is expected to be approved and enter into force in 2020.

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, there are ongoing activities associated with the draft of the NPOA-Shark, started in 2016. In 2018 Mozambique continued with elaboration of the NPOA-sharks, with a first draft to be delivered in 2019 throuthout a coolaboration between Mozambique government, WWF, WCS, TRAFFIC and other national agencies. Artisanal sector is the main one catching IOTC sharks in Mozambique with an estimated catch of 2,336 tons (IOTC and non IOTC sharks) in 2017 (No Update in 2018) of which hammerhead sharks represented 71% (Table 12). Most of the catch comes from Zambezia province with 80%, followed by Sofala province with 18% of the total sharks (Table 12).

Table 12. Catch composition of Sharks in the artisanal fisheries in 2017 (not updated in 2018).

Species	Cabo Delgado	Nampula	Zambezia	Sofala	Inhambane	Maputo	Total by Species
Hammerhead sharks	8,3	0,0	1,358.6	285,9	1,1	0,0	1,653.9
Milk shark	0,0	0,6	513,9	140,3	0,0	1,1	656,0
Sharks nei	11,1	9,4	0,0	5,7	0,0	0,0	26,2
Total by province	19,4	10,0	1872,5	432,0	1,1	1,1	2,336.1

The semi-industrial linefishery has practically null impacts on shark species. The level of sharks in the Recreational and sport fishery is unknown but is assumed to not be significant. The nominal shark catch information regarding the longline fleets, both foreign and national, are reflected in the tables 6 and 7 respectively.

5.2 Seabirds

No NPOA is available for seabirds yet, but in the perspective to evaluate the potential impact on seabirds from both national and foreign longline fleets Mozambique joined the FAO Common Oceans Project implemented by the Birdlife South Africa. In 2017, a national awareness workshop on seabirds was conducted with support of Birdlife South Africa. The event joined the representatives of the national and foreign vessel with license to operate in Mozambique waters, members of the government and NGOs to discuss issues related to conservation of seabirds, including potential interactions of the fleet with seabirds and mitigation measures.

The current activities in place in order to ensure the conservation of seabirds are; regular briefing of masters on the mandatory requirement to report any seabird interaction with longline fleet and the deployment of scientific observers on-board the vessels. Vessels used to implement night setting and line-weigh either when operating above or below the parallel 25°S. The total effort of the national longline fleet south of 25°S, within the Mozambique EEZ, was 38,323 hooks deployed.

A null interaction of the fleet with seabirds was reported in 2017 logbooks. 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. This document will be updated and presented in the next session of the WPEB in 2019.

5.3 Marine Turtles

No specific strategy for marine turtles is available yet. However, Mozambican tuna longline logbooks in use since 2012 include fields to register information on interactions of the fishery with sea turtles. Additionally, the observer program implemented in this fishery collects information on interactions of the fishery with marine sea turtles. In 2017 a total of four interactions with turtles were observed in a total of 22 fishing days. During this period the total number of hooks deployed were approximately 23,000 hooks, thus giving a rate of around one turtle/6,000 hooks. All marine turtles were released alive and in good state. In 2015, based on scientific observer data, it was assessed that the interaction catch ratio was one turtle/7,000 hooks deployed in the longline fleet and that specimens are released alive and in good state (IOTC – 2015 – WPEB 11-45). This document will be updated and presented in the next session of the WPEB in 2019.

Sea turtles interactions with fisheries in Mozambique have been reported in the Sofala Bank shrimp trawlers since the onset of the fishery. The first attempt to quantify the level of incidental catch and mortality of turtles in this fishery using an interview based was done by Gove et al., (2001) which concluded that sea turtles capture and mortality by shrimp trawlers was a problem since every fishing season between 1,932 and 5,436 sea turtles were caught and thus, it was 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) considered 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) concluding that at least 1,735±1,235 sea turtles are caught each fishing season. Over 54.8% of the incidents occur within 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 interactions between the artisanal fisheries with sea turtles are known to exist, no recent studies are available to cite on the magnitude of these interaction along the coastal area and especially in the main fishing grounds.

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

The interaction of cetaceans with the longline gear is null according to the scientific observer data (IOTC – 2015 – WPEB 11-45).

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) created in 2015 (Decreto 1/2015 de 16 Janeiro) with the extinction of the former Ministry of Fisheries. To improve the coverage and quality of fisheries data, MIMAP made both structural and functional changes on the fisheries statistical system which is reflected in the revised master plan of fisheries statistics. In the new framework, DEPI (Directorate of Studies, Plan and Infrastructures) is the Directorate within the Ministry, responsible to globalize and publish the fisheries data that includes catch, effort and socio-economic data. As the data collection system is decentralized, at province level the DEPI mandate is delegated to DPMAIPs (Provincial Directorate of Sea, Inland waters and Fisheries). There are autonomous institutions from this Ministry responsibly for collecting fisheries statistics. The institutions are namely the National Fisheries Administration (ADNAP), the National Fisheries Research Institute (IIP), and the National Institute for the Development of Fisheries and Aquaculture (IDEPA) (Table 13).

Table 13. Fisheries data collection in Mozambique: Institutions involved and categories of data collected.

Category of data	Artisanal fleet	Semi-industrial fleet	Industrial fleet	Recreational and Sport
Fishing craft statistics/ licenses	IDEPA/ADNAP	ADNAP/ DPMAIP	ADNAP/ DPMAIP	ADNAP/ DPMAIP
Catch-and-effort data	DEPI/DPMAIP	ADNAP/ DPMAIP	ADNAP/ DPMAIP	ADNAP/ DPMAIP
Length frequency data	IIP	IIP	IIP	IIP
Other scientific data	IIP	IIP	IIP	IIP
Socio-economic data	IDEPA/DEPI/ DPMAIP	DEPI	DEPI	DEPI

All fisheries except the artisanal subsistence fisheries (invertebrate collectors), are subjected to monitoring programs. On–board observer program is conducted by IIP in semi-industrial

and industrial commercial fisheries. Artisanal fisheries are monitored through National Stratified Random Sampling System locally known as SNAPA (Sistema Nacional de Amostragem da Pesca Artesanal). Historically, the system was implemented by IIP but since 2015 this is under responsibility of DEPI and DPMAIPs. The number of artisanal gears available in the country and other social aspects of the artisanal sector are assessed on a five-year basis through a national census of the artisanal fishing (frame survey) conducted 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 tournaments and also by catch reports that the organizers provides to the fishing sector authorities (DPMAIs).
The logbooks and other monitoring tools are also used as part of monitoring system (see table 14 below). These Logbooks are monitored by ADNAP which also issue the fishing licenses. At province level the role of ADNAP is secured by the DPMAIPs.

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 at annual basis 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 fishery activity.
Mozambique still faces difficult in terms of accessing to logsheet data of foreign fleet.

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 it 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

Scientific Observer programme is implemented for all national industrial fisheries. For the linefishery the scientific observer programme has been carried out since year 1998 while for the national longline fleet it has been implemented since 2015. In 2017, a total of 139 fishing days were observed on-board linefish vessels and 22 days on-board longline vessels (Table 14).
For artisanal fisheries a sampling program started on experimental basis in 1997. 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 frequency of the dominant species. Not all fishing centres are sampled. The geographical extension and complexity of the artisanal sector, which primarily do not target IOTC species, associated with logistical (financial) limitations for the implementation of the sampling system are the primary causes affecting the effectiveness of data collection. To improve the the coverage and the quality of fisheries data there is a pilot implementation of the *FAO ARTFISH data collection framework* which is expected to replace the actual system that relay on PESCART database. As ARTIFISH does not secure collection of biological data, this swift will imply a review of the research plan by IIP and, to complement the primary catch and effort statistics generated by ARTIFISH.

The recreational fishing is the less monitored fishery, where IIP distribute fishing catch cards to lodges and hotels were recreational fishing is a current activity but the level of return of these cards is very low. The cards were expected to be filled per outing but the operators normally inform or argument that tourist fishers do not will or accept to complete the cards or they forget to fill it what represents a serious offence to the minimum requirement of the law in terms of information provision by those was conduct fishery activities.

Table 14. The data collection coverage by IIP and ADNAP in 2018 for Mozambican fisheries with potential impacts on IOTC species.

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	4%	0%	NA	100%
3. Industrial	Yes	No	NA	Yes
3.2. Linefishery	6%	0%	NA	100%
3.3. Pelagic longline	11.5%	0%	NA	100%
4. Recreational & sport	NA	NA	Yes	Yes
4.1. Recreational fishing	NA	NA	5%	5%
4.2. Sport fishing	NA	NA	5%	5%

Mozambique is committed with IOTC initiatives and will to improve the country ability to carry out scientific monitoring of tuna and tuna-like species by implementing innovative research projects that allow capturing relevant information and data. 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 recent theoretical training course for Mozambique scientific observers was conducted at Maputo IIP-headquarters by the Fishery Cooperation Foundation of Japan in 2016.

6.4. Length data

Table 15 shows the length data collected in the fisheries which potentially impact on IOTC species.

Table 15. Number of individuals measured by species and fishery in 2018.

Fisheries	Species	Number sampled	Observation
Semi-industrial Linefishery	Narrow-barred Spanish mackerel	123	Narrow-barred Spanish mackerel is unique IOTC species captured in this fishery. Biological data including lengths are collect by mean of observer on board.
Recreational and Sport fishery (hook and line)	Yellowfin tuna	1245	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
	Skipjack tuna	190	
	Narrow-bared Spanish mackerel	682	
Industrial Longline Fishery	Swordfish	303	Data collected thought scientific observers on-board
	Striped marlin	6	
	Indo-pacific sailfish	72	
	Blue marlin	23	
	Black marlin	18	
	Bigeye tuna	51	
	Yellowfin tuna	300	
	Albacore	8	
	Longtail tuna	14	
	Short-billed spearfish	46	

6.5. Unloading/Transhipment [including date commenced and status of implementation]
No transhipment by Mozambique flagged vessels and within Mozambique waters**.**

7. NATIONAL RESEARCH PROGRAMS

The Fisheries Research Institute (IIP), under the Ministry of Sea, Inland Waters and Fisheries, has the mandate of conducting research in fisheries related issues as well as the aquatic environment and aquaculture in an ecosystem based approach. Several research activities aiming to estimate the biomass and the maximum sustainable yields of demersal fish, small 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 funding agencies.

In terms of research programs on IOTC large pelagic species Mozambique continued with the implementation of the program initiated in 2015 aiming to improve the artisanal fishing data collection and reporting to the IOTC for full compliance with the resolution 15/02 (IOTC-2016-WPDCS12-13). Additionally, there is a need to improve the knowledge on tunas and tuna-like species in order to support the promotion of a target oriented small scale tuna fishery in this region according the national strategic plan for development of tuna fisheries (PEDPA - Plano Estratégico de Desenvolvimento da Pescaria de Atum em Moçambique). In the Industrial sector, Mozambique continued with the implementation of the mandatory scientific observer program to collect the demanded data, under the IOTC framework, including size frequency data and the ecosystem related information (depredation, impacts of the fishery on marine turtles, seabirds and protected sharks).

Mozambique also continued with the research activities planned under the Linefish management plan (2014-2018).

Table 16. Summary table of national research programs, including dates.

Project title	Period	Countries involved	Budget total	Funding source	Objectives	Short description
Implementation of the linefish management plan	2014-2018			Mozambique Government	Guarantee the sustainability of linefishery by using an ecosystem approach	Stock assessment of Spanish mackerel conducted for Mozambique channel sub-stock.
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	The gaps on data collection were detected and an action plan to improve the data collection and reporting in the line with IOTC requirements

					Cabo Delgado provinces	was produced. Interview and sampling on landing site was conducted in 2016 to characterize the artisanal tuna fishery in the northern region.

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

Table 17. Scientific requirements contained in Resolutions of the Commission, adopted between 2005 and 2016. Are

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 2014 the national tuna longline logbook that captures all required information stated in this resolution.
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. Additionally, 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. 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 recording the incidentals catches and live releases of the oceanic whitetip through scientific observer scheme. Fishing masters are continuously encouraged to record and report on this species of shark during

Res. No.	Resolution	Scientific requirement	CPC progress
			the pre-fishing briefing. Also, this resolution is included in the Terms and Conditions for Tuna License.
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 recording the incidentals catches and live releases of sharks of *Alopiidae family* through scientific observer scheme. Fishing masters are continuously encouraged to record and report on these species of sharks during the pre-fishing briefing. Also, this resolution is included in the Terms and Conditions for Tuna License. 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	Based on the longline logbook information and the observer scheme observations, Mozambique reported that his longline fleet doesn't have interactions with seabirds. The measures adopted by the fleet to reduce incidental seabird bycatch is; night setting and branch line weighting. 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	Observer scheme observations, shows that there are some interactions of longline with these species. Turtles incidentally caught are released alive. Mozambique is regularly briefing the master of the vessels on the mandatory requirement to report all interactions with marine turtles and on safe realise procedures. Also, this resolution is included in the Terms and Conditions for Tuna License.
11/04	On a regional observer scheme	Paragraph 9	In 2017, two trips were covered by Mozambique observers in the national longline fishery, accounting to a total of 22 days at sea. This corresponds to a coverage level of 11% as the total operational effort of the fleet was 190 cumulative days. The observer's data will be shared and submitted in the WPDCS13.

Res. No.	Resolution	Scientific requirement	CPC progress
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 2017 within the deadlines. However, this still needs improvements to better report catches at the species level.
16/06	On measures applicable in case of non-fulfilment of reporting obligations in the IOTC	Paragraph 1	-Mozambique updates annually, the Terms and Conditions for Tuna License where all relevant IOTC resolutions are listed; -Mozambique is implementing a mandatory logbook since 2013, based on the IOTC requirements for data gathering. Mozambique conduct pre fishing briefings sessions prior to give fishing license to the fishing masters at port where they are informed to comply with recording of data according to the logbook. Mozambique also conducts trainings for the vessel masters on how to fill properly the logbooks. The quality of loogbook data for national fleet is assessed by comparing it with the scientific observer data, mainly on ecosystem and bycatch issues. -Mozambique is implementing Electronic Report System-ERS for foreign fleet, entry exit catch report system and Vessel Monitoring System which cover all national and foreign tuna vessels; -Mozambique is implementing observer scheme for national fleet and Mozambique observers were trained by OFCF-Japan in 2016. The levels of coverage by observer were set above the minimum required of 5% of fleet operations. In 2015 the coverage level was 16% while in 2016 and 2017 the coverage was 11%. Increased levels of coverage give more confidence on fisheries data system; - Mozambique is implementing the pilot project to improve the data collection on artisanal costal tuna fisheries in two northern provinces (Cabo Delgado and Nampula) where artisanal fisheries show significant catches of tuna species and billfishes; -The master plan of fishing statistics was recently revised aiming to

Res. No.	Resolution	Scientific requirement	CPC progress
			adequate the actual data collection system to the new structure of the fishing sector (under the Ministry of Sea, Inland Waters and Fisheries) and decentralization process; - Following recommendations of the Secretariat, Mozambique adopted the Submission of observer data in electronic format since 2015, that is more accessible by the secretariat (data section) and minimize data entry errors. Observer data from year 2017 were submitted to the IOTC.
16/01	On an interim plan for rebuilding the Indian Ocean yellowfin tuna in the IOTC area of competence		This requirement or measure is not applicable to Mozambique and as a consequently no action has been taken so far. However, Mozambique is planning to share the requirement with national fleet to be aware on the requirement in the case of level of catches of yellowfin increase.

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