



# Mozambique National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2017

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## INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

<p>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, <b>for all fleets other than longline.</b></p>	<p>YES</p> <p>The data from Industrial Mozambique tuna fleet, semi-industrial linefishery and artisanal fishery were sent, to the IOTC secretariat on 30<sup>th</sup> June 2017. Also, these data are reflected in this report.</p>
<p>In accordance with IOTC Resolution 15/02, provisional <b>longline data</b> for the previous year was provided to the IOTC Secretariat by 30 June of the current year.</p> <p><b>REMINDER:</b> Final longline data for the previous year is due to the IOTC Secretariat by 30 Dec of the current year</p>	<p>YES</p> <p>Mozambique has submitted the preliminary data of longline fleet of the year 2016, to the IOTC secretariat on 30<sup>th</sup> June 2017.</p> <p>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 2017.</p>
<p>If no, please indicate the reason(s) and intended actions:</p>	

## Executive Summary

This document represents 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 and management of species under the IOTC mandate.

In 2016, similarly to previous years, the industrial tuna fishery was dominated by the distant water fishing nations -DWFN- accessing the resources through fishery Partnership Access Agreement. A total of 23 longliners and seven purse seiners were licensed in this year. The total catch reported by these fleets was 3,445 tons, 12% above the registered catch in 2015.

At domestic level, the national industrial tuna fleet operated with a total of five longline vessels, from which three only operated during the first quarter of the year. The total catch of this fleet was 117 tons, which represents a reduction of 57% comparatively to 2015.

The semi-industrial linefishing fleet of 26 vessels (14m-19m LOA) targeting primarily demersal rocky bottom species, landed in 2016 about 83 tons of Narrow-barred Spanish mackerel, which is the only IOTC species caught by this sector.

The artisanal sector is the major and most complex fishing segment in Mozambique. The main gear used are gillnet, beach seine and handline. The capture of IOTC species by this sector is at some extent opportunistic with limited species targeting. The annual landing of IOTC species is relatively low (around 3% of total catch) when compared to small pelagic and demersal fish species. The estimated total catch of IOTC primary species in 2016 was 3,715 tons, 12% below the 2015 landings. The Narrow-barred Spanish mackerel was the main IOTC species caught with a total of 2513 tons, 68% of the total IOTC primary species landings. Sharks are also a significant component among the IOTC species caught by this fishing segment with emphasis on hammerhead sharks and Requiem sharks. Neritic tunas are caught by small purse seiners and handline operators in the northern coast. In this particular area, tropical tunas and billfishes are also caught although in small quantity. Despite having a monitoring scheme in place for artisanal fisheries, there is still a need of improvement in data collection and reporting for IOTC species.

The recreational sector issued a total of 3,400 licenses in 2016, which also may represent a potential source of impact on tuna and tuna like species. However, data collection and reporting of this fishing segment is still deficient with a very rough estimate of IOTC species catches and effort.

In terms of research, Mozambique continued with the implementation of the program initiated in 2015 aiming to establish a specific and improved sampling for artisanal fisheries in the northern coast. This will improve the level of compliance with the resolution 15/02, and fill the gaps of knowledge on tunas and tuna like species, which is an important step towards the promotion of a target oriented small scale tuna fishery in accordance with the national strategic plan for development of tuna fisheries (PEDPA).

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 in order to help in combating IUU fishing in the region. Finally, Mozambique is internally improving the monitoring and control of the tuna fisheries through implementation of initiatives involving different stakeholders (managers, researchers, operators and civil society).



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## 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 2,470 km, a total continental shelf area of about 104,300 km<sup>2</sup> and an EEZ area of 999, 000Km<sup>2</sup>. 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 (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.

*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 20% 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 fishery usually takes place from beaches or near coastal waters (generally within 3 miles) using canoes and small motorized boats less than 10 m in length. Fishing operations is conducted with a wide range of gears, including beach-seines, hand-lines, gillnets, 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, 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. The national longline tuna fishery is on it incipient phase, and despite having currently eleven 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 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 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 fishing tuna and tuna-like species from Mozambique fishing area. The number of fishing vessels licensed during 2016 for the Mozambican fishing area 30, comprised by 23 longliners and 7 purseiners. There is a decrease in number of foreign vessels licensed to operate in Mozambican waters (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 2016 (Source: ADNAP 2007 to 2016 annual reports & MIMAIP, 2016).

Year	N° 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	25
2016	7	23

The national Industrial tuna 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 (Table 2). In 2015 other seven boats were introduced increasing the fleet to a total of nine longliners licenced (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).

**Table 2.** Number of fishing licenses issued to National Longline vessels from 2014 to 2016.

Year	Licenses
2014	2
2015	9
2016	5

The Recreational and sport fishing, other sector that target on IOTC primary species, in 2016 issued around 3400 licenses for coastal provinces operators. From the table 3, it can be seen that the main area for recreational operations is the southern coast (Maputo, Gaza and Inhambane) with more than 90% of the licenses issued. Differently from the trend verified until 2014, the number of licenses issued in the last two years decreased. From 2014 to 2015 it decreased about 8% and from 2015 to 2016 it decreased 23%.

**Table 3.** Number of recreational licenses (Recreational and Sport fishing) issued for coastal provinces by ADNAP from 2011 to 2016.

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	141	0	0	69	1,690	467	1,034	3,401

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
<p>Artisanal</p> <p>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).</p>	N/A	N/A	Handline and beach seine	<p>Artisanal fisheries are multi-gear and multispecies and occur along all the coastal provinces, targeting almost everything and are formally licensed.</p> <p>The main species are small pelagic and small demersal fish of the inshore coastal area and estuaries where the fishery occurs.</p> <p>No mean of catch conservation or iced catch (1 day trip maximum).</p>
	Canoe < 3m (paddle)	1-6	Handline/trap, beach seine, gillnet, purse seines and longlines	
	Boat, 3-8m (paddle/sail)			
	Boat 5-10m (outboard)			
	Skiboat, 5-8m	3-6	Rod + line	
<p>Recreational and sport fishing</p> <p>No accurate data is available; around 50 boats operate annually</p>	N/A	N/A	Rod + line	<p>The recreational involves a large number of people fishing demersal and pelagic linefish as leisure. Operations takes place from shore or boat based.</p> <p>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.</p>
	Skiboat – sport, 5-8m	2-6	Rod + line	
	Skiboat – spear, 5-8m	2-6	Spear	
<p>Semi-industrial</p> <p>An average of 21 operational vessels/month</p>	10-20m	10-15	Rod + line/handline	<p>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.</p>

Industrial	vessels >23m	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.
An average of two operational vessel/month	(many are 23.3m)			

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 artisanal that information is provided by IDPPE, 2012.

Fishery sector	Gear	N# licenses 2012	N# licenses 2013	N# licenses 2014	N# licenses 2015	N# licenses 2016
<b>Artisanal</b>						
	Beach seine	9,042	9,916	9,916	9,916	9,916
	Handlines	12,683	13,853	13,853	13,853	13,853
	Gillnets	14,817	20,396	20,396	20,396	20,396
	Longlines	678	1,077	1,077	1,077	1,077
	Purse seine		563	563	563	563
<b>Semi-industrial</b>						
	Sofala bank Shallow water shrimp	14	22	23	41	43
	Linefishery	43	40	34	40	30
<b>Industrial</b>						
	Sofala bank Shallow water shrimp;	57	44	35	20	16
	Pelagic longline tuna	1	0	2	9	5
<b>Recreational &amp; sport</b>						
	Coastal provinces Recreational and sport fishing	2,741	3,552	4,853	4,452	3,401

- **Comments on artisanal fisheries**

*Information based on census 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 April for purse seiners. The estimated total catch of DWTFN operating in Mozambique waters in 2016 accounted to 3445 tons which represents an increase in 12% in relation to 2015. From this catch, 94% was from longline fleet and 6% from purse seine fleet. The total catches of Longline fleet in 2016, account to 3249 tons which represents an increase in 5.5% in relation to 2015. Purse seine fleet operated only for 19 days in 2016 and its catch was 193 tons.

Despite a notorious reduction in number of foreign fishing vessels licensed, the operations of this fleet in Mozambique waters and the fishing effort seems to remain stable.

The catch composition of foreign fleet in 2016 was dominated by yellowfin tuna which accounted to 62% of total catch. The bigeye tuna contributed 8%, swordfish with 6.6% and albacore with 6.2%. The species contribution by year is presented in the table 6 below.

**Table 6.** Annual catch of the IOTC primary species in tons and fishing effort in fishing days of DWTFN in Mozambican fishing area.

Species	2010	2011	2012	2013	2014	2015	2016
Albacore	248	663	114	229	212	-	203
Skipjack tuna	2,345	1,162	249	21	12	118	67
Bigeye tuna	274	387	154	257	361	231	257
Yellowfin tuna	1,613	2,280	890	2,096	2,275	2,237	2,018
Swordfish	837	463	920	590	205	112	214
Black marlin	-	-	-	-	-	86	60
Blue marlin	-	-	-	-	-	14	50
Striped marlin	-	-	-	-	-	44	78
Indo-pacific Sailfish	-	-	-	-	-	45	32
Shortbill spearfish	-	-	-	-	-	-	13
Blue shark	-	-	-	-	-	-	73
Porbeagle	-	-	-	-	-	-	4
Others	603	465	99	448	-	190	240
Total catch	6,640	5,925	2,426	4,149	3,065	3,079	3,249

Effort	2,727	2,412	1,551	1,734	2,215	2,229	2,238
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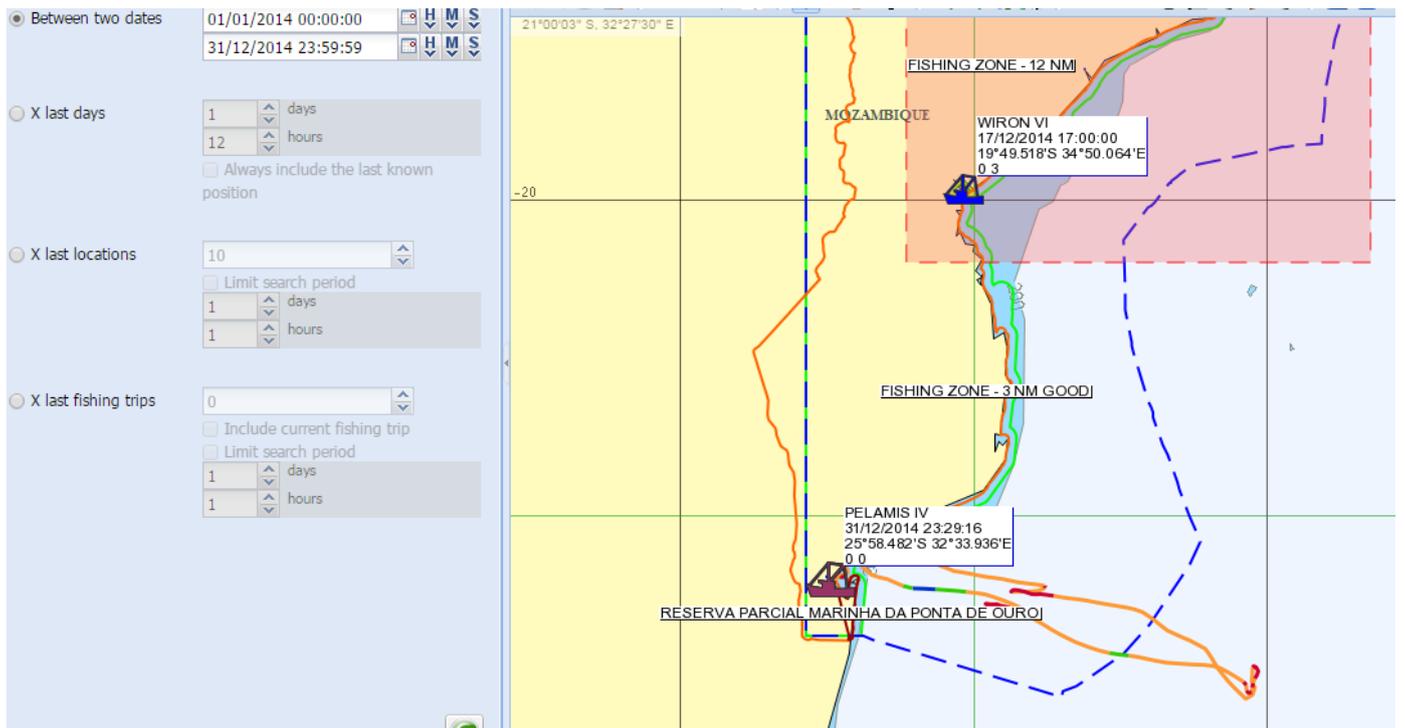
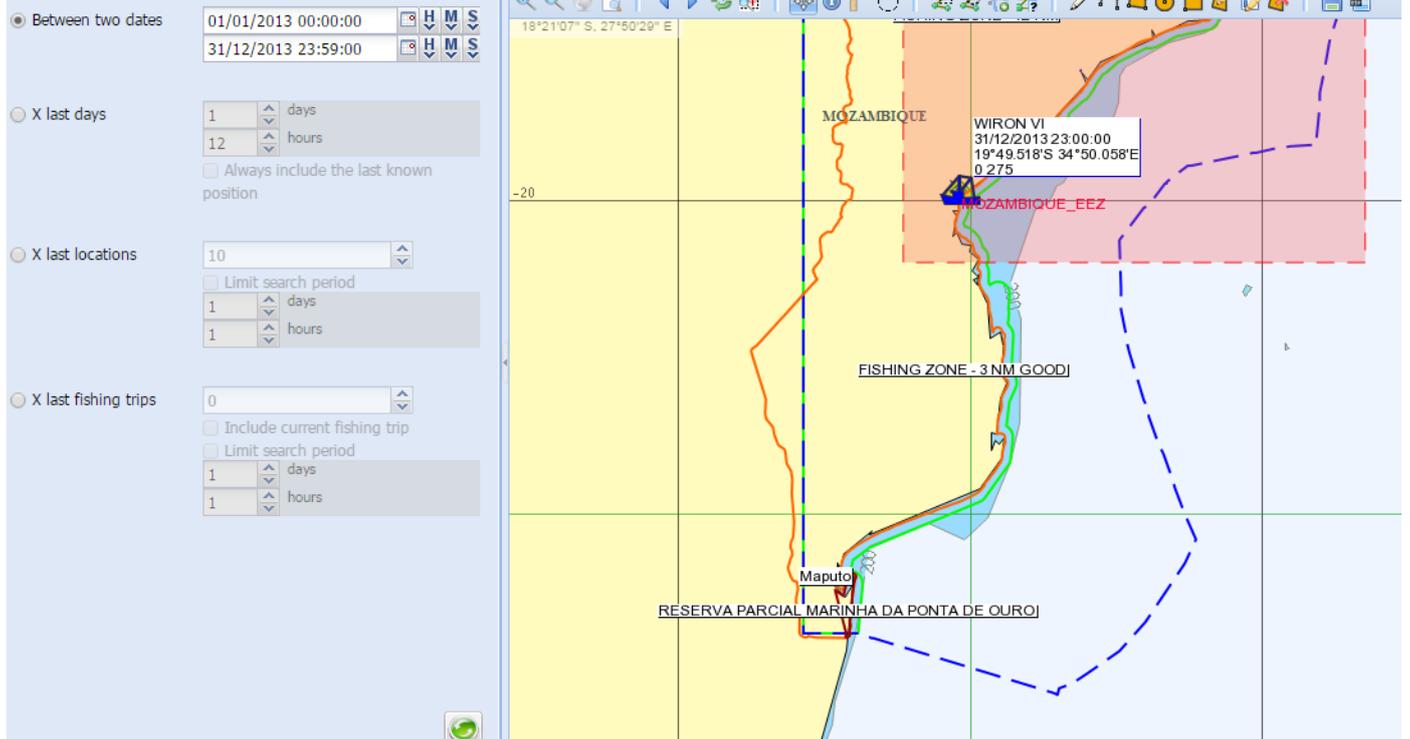
- CATCH AND EFFORT BY THE INDUSTRIAL NATIONAL FLEET

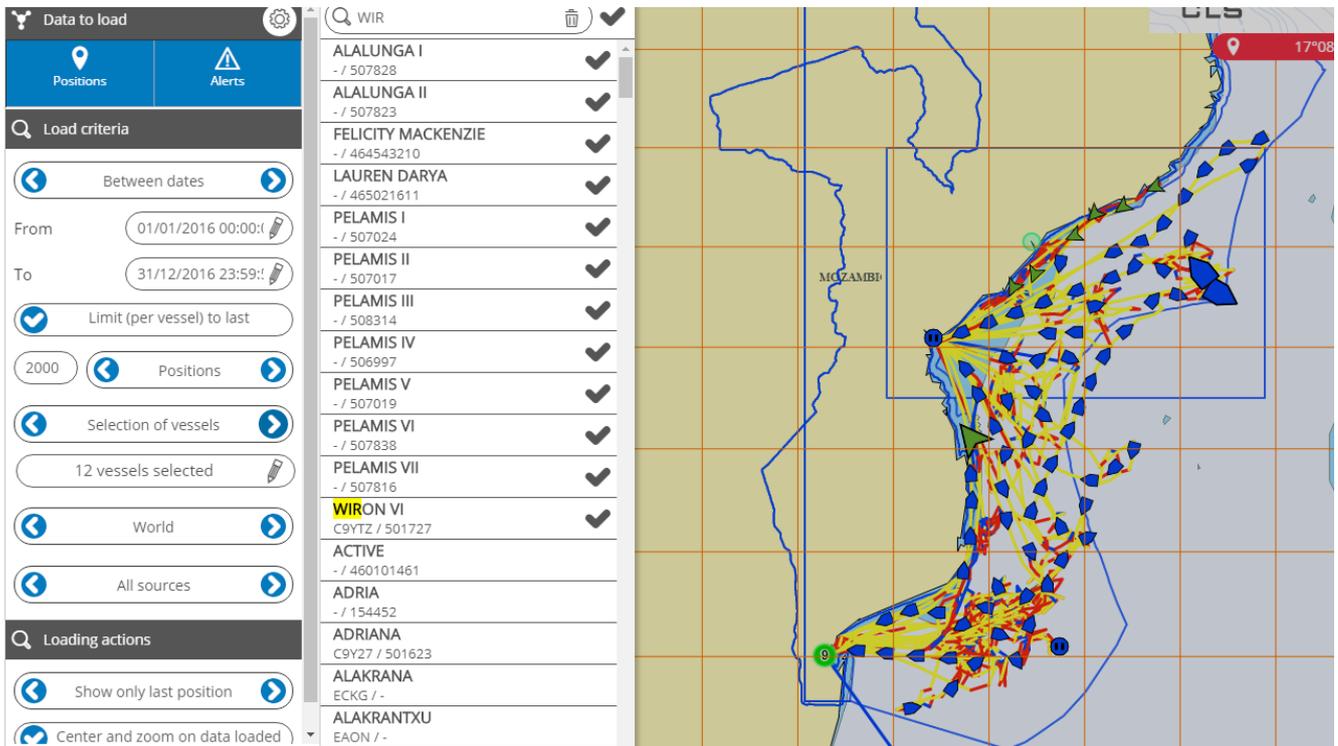
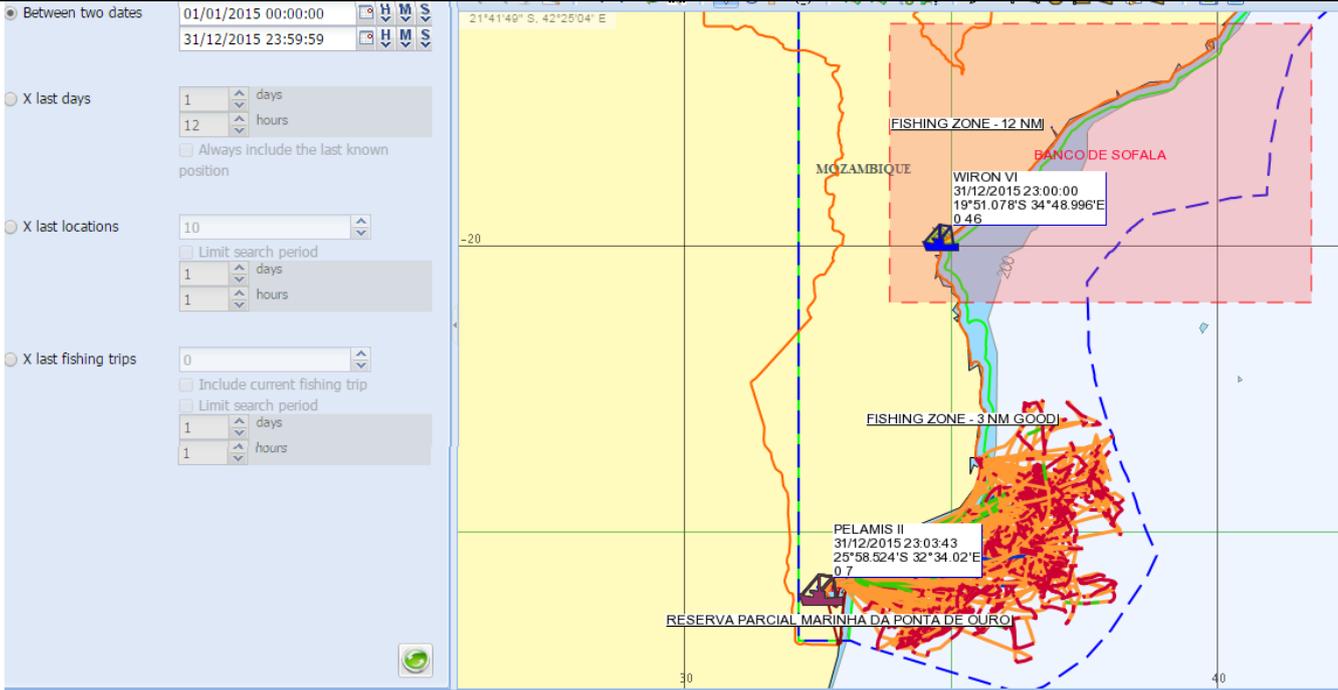
The national longline tuna fleet production in 2016 was 177 tons with the most important species being Swordfish (36%), Yellowfin tuna (21%) and Bigeye tuna (15%) (Table 7). The fishing effort in 2016 was of 230,296 hooks deployed.

**Table 7.** Variation of the annual catch in kilograms and fishing effort in fishing days.

	year 2014	years 2015	Year 2016
Southern Bluefin tuna	-	-	2
Albacore		3.7	0.3
Bigeye	0.8	33.6	15
Yellowfin tuna	1.4	51.3	21
Skipjack tuna		1.8	4
Swordfish	3.3	73	36
Striped Marlin		0.15	6
Blue Marlin		1.7	4.2
Black Marlin		8.5	10
Indo-pacific Sailfish		290	6
Short Bill spearfish		6.1	1.5
Blue shark		10.7	0.7
Hammerhead Sharks		1.5	-
Mako Sharks		1.5	-
Others	2	13.8	10.6
Total Catch	7.5	217.5	117
Total Effort	6	310	-

The map of fishing effort distribution presented below is related to the industrial longliners in 2013, 2014, 2015 and 2016. The red dots refer to the positions where the fishing activity occurred.





**Figure 1a, b c and d.** Map of the distribution of fishing effort in 2013, 2014, 2015 and 2016 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 in 2016. **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. 2012–2016). **Not available**

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

The estimated catch of IOTC primary species by the artisanal coastal fisheries in 2016 was 3,715 tons, 12% below the 2015 catch (Table 8). The catch information for artisanal fisheries comes from six of the seven coastal provinces. The provinces with high contribution were Nampula (51%) followed by Inhambane (18%) and details of species catch contribution by province are presented in Table 8. Cabo Delgado and Nampula 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 province.

Species	Cabo Delgado	Nampula	Zambezia	Sofala	Inhambane	Maputo	Total by Species
Albacore	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bigeye tuna	0.0	38.4	0.0	0.0	0.0	0.0	38.4
Blue Marlin	37.0	0.0	10.5	0.0	16.8	0.0	64.3
Frigate tuna	30.4	821.3	0.1	0.6	29.3	0.2	882.0
Indo-Pacific Sailfish	3.0	0.0	0.0	0.0	0.0	0.0	3.0
Kawakawa	0.0	26.5	0.0	0.0	0.0	0.1	26.6
Longtail tuna	0.0	0.0	1.5	0.0	0.0	0.0	1.5
Narrow-barred Spanish mackerel	28.8	862.9	230.3	388.6	616.8	386.2	2,513.5
Skipjack tuna	15.0	0.0	0.0	0.0	0.0	0.0	15.0
Swordfish	0.9	0.0	0.0	0.0	0.0	0.0	1
Yellowfin tuna	6.6	152.2	0.0	0.0	0.0	11.2	170.0
Total by Provinces	<b>121.7</b>	<b>1,901.3</b>	<b>242.4</b>	<b>389.2</b>	<b>662.9</b>	<b>397.7</b>	<b>3,715.1</b>

**Table 9.** Aggregated Annual Catch in tonnes of IOTC primary species by artisanal coastal fisheries for seven years time (2010-2016).

Species	2010	2011	2012	2013	2014	2015	2016	
Yellowfin tuna	1	0	3	0	4	12.7	170	
Skipjack tuna	43	0	0	0	15	37.1	15	
Bigeye tuna	321	26	2,125	0	36	12.3	38.4	
Albacore	6	0	16	0	75	1.8	0	
Black Marlin	0	0	0	10	66	66	-	
Indo-Pacific Sailfish	0	0	0	0	16	0	3	
Swordfish	0	0	0	0	0	0	1	
Narrow barred Spanish mackerel	1,676	690	2,224	579	2,623	1,973	2,513	
Striped marlin	11	0	0	0	0	0	0	
Blue Marlin	28	0	0	0		62	64.3	
Frigate tuna	2,551	66	444	170	1,598	1,900	882	
Kawakawa	125	3	567	121	10	171	26.6	
Longtail tuna	125	0	0	0	0	0	1.5	
Total catch	4,886	786	5,378	880	4,443	4,236	3,715	
Total fishing effort	Annual fishing effort not available							

**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 2016:** 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 2016 was 83 tons, 130% of increase compared to previous years, despite fishing effort. 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), in 2013, 2014 and 2015.

Narrow-barred Spanish Mackerel	2013	2014	2015	2016
Total Catch	150	80	36	83
Total effort	4,100	4,560	4,536	4,656

## 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 (11%) and Inhambane provinces (45%).

In 2016, the monitoring program covered the Maputo province (Ponta d'ouro) and Maputo City area, with a total catch of IOTC species accounting to 4.6 tons. . The most targeted species were yellowfin tuna with 59% and the narrow-barred Spanish mackerel 27% of the total estimated catch as described in Table 11.

**Table 11.** Catch composition of IOTC primary species by recreational and sport fishing in Maputo city and Maputo Province.

Sub-fishery	Kawakawa	Indo-Pacific sailfish	Skipjack tuna	Black Marlin	Narrow-barred Spanish mackerel	Yellowfin tuna	Frigate tuna	Total
Sport	0.04	0.19	0.34	0.03	0.97	2.70	0.00	4.3
Recreational	0.01	0.00	0.02	0.00	0.26	0.02	0.01	0.3
Total	0.05	0.19	0.36	0.03	1.24	2.72	0.01	4.6

Raising the catch from Maputo to the all country, based on the numbers of fishing licenses per province, rough estimate of 14 ton of IOTC primary species was achieved for these fisheries.

For the recreational fishing, voluntary submission of catch cards (mainly on boats) occurred from 1996 to 1999 at Ponta d'Ouro and Ponta Malongane in the south coast in a pitot monitoring program. After a pause of eight year, in 2008 the program was restarted and extended to Gaza and Inhambane provinces. However, the cards are inconsistently completed by anglers, using 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. Ponta d'Ouro and Malongane are within a conservation area, where the Marine Park officers were trained by IIP (Fisheries Research Institute) and a partnership was established for the collection of these cards.

Beyond these difficulties, an internal discussion in the sector commenced to assess the measures that can be implemented in order to “enforce” the need of complying with data reporting by the recreational anglers and it is expect to achieve improvements in the near future.

## **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. 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, 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 2018.

Recreational and sport fishery has practically null impacts on shark species.

The artisanal, semi-industrial and Industrial fisheries impacts on sharks are under assessment in the framework of the preparation of the Mozambican NPO-Shark. 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, but there is an ongoing discussion with Birdlife South Africa, under the Common Oceans Project, to organize a national awareness workshop regarding the impact of fishing (especially longline) on seabirds in 2017. 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.

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 seabird's conservation measures in the terms and conditions for licensing.

### 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. 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).

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 assessment 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  $1,735 \pm 1,235$  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 interactions along the coastal area and specially in the main fishing grounds.

#### 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 (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). 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. 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: the National Fisheries Administration (ADNAP), the National Fisheries Research Institute (IIP), and the National Institute for the Development of Fisheries and Aquaculture (IDEPA) (Table 12).

**Table 12.** 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
<i>Annual catches</i>	DEPI/DPMAIP	ADNAP/DPMAIP	ADNAP/DPMAIP	ADNAP/DPMAIP
<i>Fishing craft statistics/licenses</i>	IDEPA/ADNAP	ADNAP/DPMAIP	ADNAP/DPMAIP	ADNAP/DPMAIP
<i>Catch-and-effort data</i>	DEPI/DPMAIP	ADNAP/DPMAIP	ADNAP/DPMAIP	ADNAP/DPMAIP
<i>Length frequency data</i>	IIP	IIP	IIP	IIP
<i>Other scientific data</i>	IIP	IIP	IIP	IIP
<i>Socio-economic data</i>	IDEPA/DEPI	DEPI	DEPI	DEPI

All fisheries except the artisanal subsistence fisheries (invertebrate collectors), are subjected to monitoring programs. The on-board observer program is conducted by IIP 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) implemented by DEPI and DPMAIPs. 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 (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 12 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. Despite a functional data collection system existing on National scale, there are difficulties to fulfil with the IOTC standards for data collection and reporting, particularly regarding the artisanal and recreational fisheries. 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 the master plan of fisheries statistics is in revision with support of the SWIOFHISH Project. The revision started in 2016 and it is expected to be implemented in 2017.

### **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.

Linked to this program, there is a national observer scheme for the collection the scientific data as required by IOTC. See the summary in table 12.

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 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**

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 2015 (Table 13).

For artisanal fisheries a sampling program was initially started on experimental basis in 1997 and gradually 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 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 of artisanal fisheries.

The recreational fishing is the less monitored fishery, where IIP distribute fishing catch cards to many lodges and hotels were recreational fishing is a current activity but the level of return of these cards is very low. The cards were supposed 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.

Mozambique is committed with IOTC initiatives in this field and will improve the ability of the country to carry out scientific monitoring of tuna implementing innovative research projects that allow capturing this information. 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 training course for Mozambique

scientific observers were conducted at Maputo IIP-headquarters, provided by the Fishery Cooperation Foundation of Japan in 2016.

**Table 13.** The data collection coverage by IIP and ADNAP in 2016 for Mozambican fisheries with potential impacts on IOTC species.

Fishery Sector and fisheries	On-board Sampling (%)	Port Sampling (%)	On landing site Sampling (%)	Logbooks (%)
<b>1. Artisanal</b>	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%
<b>2. Semi-industrial</b>	Yes	Yes	NA	Yes
2.1 Linefishery	10%	10%	NA	100%
<b>3. Industrial</b>	Yes	No	NA	Yes
3.2. Linefishery	20%	0%	NA	100%
3.3. Pelagic longline	11%	0%	NA	100%
<b>4. Recreational &amp; sport</b>	NA	NA	Yes	Yes
4.1. Recreational fishing	NA	NA	1%	1%
4.2. Sport fishing	NA	NA	10%	10%

#### 6.4. Length data

Table 14 shows the length data collected in the fisheries which potentially impact on IOTC species.

**Table 14.** Number of individuals measured by species and fishery in 2016.

Fisheries	Species	Number sampled	Observation
Artisanal purse seine	Bullet tuna	27	While catch data are routinely recorded for all species including IOTC mandatory species, size measurements for IOTC species is not taken by artisanal sampling system. The length data presented here comes from the pilot project which IIP is implementing in Nampula and Cabo
	Frigate tuna	52	
	Kawakawa	81	
	Skipjack tuna	10	
	Narrow-barred Spanish mackerel	4	
Artisanal handline	Frigate tuna	13	
	Indo-pacific sailfish	6	
	Skipjack tuna	33	
	Black marlin	4	
	Blue marlin	1	
	Narrow-barred Spanish mackerel	28	
	Albacore	2	

	Yellowfin tuna	1	Delgado designed to improve the quality of artisanal tuna fisheries data collected and reported to the IOTC.
	Bigeye tuna	10	
Semi-industrial Linefishery	Narrow-barred Spanish mackerel	492	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	543	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	92	
	Frigate tuna	1	
	Kawakawa	11	
	Indo-pacific Sailfish	5	
	Narrow-bared Spanish mackerel		
		131	
Industrial Longline Fishery	Swordfish	346	Data collected thought scientific observers on-board
	Striped marlin	10	
	Indo-pacific sailfish	3	
	Blue marlin	18	
	Black marlin	6	
	Bigeye tuna	92	
	Yellowfin tuna	154	
	Albacore	13	
	Shortfin mako	2	
	Oceanic whitetip shark	1	

**6.5. Unloading/Transshipment** [including date commenced and status of implementation]  
No transshipment 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 undertaking 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). In 2016 Interviews and sampling at catch disembarkation at the landing sites were conducted during 30 days, between May and June 2016, in the northern provinces of Cabo-Delgado and Nampula aiming to improve the characterization of the artisanal tuna fisheries conducted with handline and small purse seines in the region. This represent a step towards the objective to establish a specific sampling program to improve the level of data collection and reporting to the IOTC, by increasing the sampling coverage at the main landing sites of this region, improving species discrimination (including for sharks) and by collecting size frequency data for IOTC primary species. 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). On Industrial sector, Mozambique continued with the implementation of the mandatory scientific observer program to collect data the requested 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 Linefishery management plan (2014-2018). Specific research aiming to assess the level of exploitation of the narrow-barred Spanish mackerel was conducted and final results disseminated in 2016.

**Table 15.** 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 Cabo Delgado provinces	The gaps on data collection were detected and an action plan to improve the data collection and reporting in the line with IOTC requirements 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 16.** 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 ( <i>Rhincodon typus</i> )	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 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

Res. No.	Resolution	Scientific requirement	CPC progress
			scheme captures the data on this species.
12/09	On the conservation of thresher sharks (family <i>alopiidae</i> ) 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 <i>Alopi</i> spp. 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. 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	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 is a few 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 2015, four trips were covered by observer, corresponding to a coverage level of 11%. The observer's data will be shared and submitted in the WPDCS13.
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 2016 within the

Res. No.	Resolution	Scientific requirement	CPC progress
			<p>deadlines. However, the logbook still needs improvements to better capture the information of more species at the species level.</p>
16/06	On measures applicable in case of non-fulfilment of reporting obligations in the IOTC	Paragraph 1	<p>-Mozambique updates annually, the Terms and Conditions for Tuna License where all relevant IOTC resolutions are listed;</p> <p>-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.</p> <p>The quality of loogbook data for national fleet is assessed by comparing it with the scientific observer data, mainly on ecosystem and bycatch issues.</p> <p>-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;</p> <p>-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 the coverage was 11%. Increased levels of coverage gives more confidence on fisheries data system;</p> <p>- 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 shows significant catches of tuna species and billfishes;</p> <p>-There is an ongoing process of revision of the master plan of fishing statistics aiming to adequate the actual data</p>

Res. No.	Resolution	Scientific requirement	CPC progress
			collection system to the new structure of the fishing sector (under the Ministry of Sea, Inland Waters and Fisheries) and decentralization process;  -Mozambique developed in 2016 a web based database for all fisheries and is currently conducting training for the operators in order to operationalize it. Following recommendations of the Secretariat, Mozambique adopted the Submission of observer data in electronic format (2015 observer reports) that is more accessible by the secretariat (data section) and minimize data entry errors.
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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