Received: 3 December, 2011
IOTC-2011-SC14-NR18

IOTC Fourteenth Session of the Scientific Committee
Mahé, Seychelles, 12-17 December 2011

National Report on Tuna Fisheries in Mauritius

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In accordance with IOTC Resolution 10/02, scientific data was provided to the IOTC by 30 June 2010 for all fleets other than longline. *Longline data was provided on 30 Dec 2009 for final data from longline fleets operating in the high seas, and 30 June 2010 for provisional data.*	*Data transmitted with final longline data on* 18 October 2011

Contents

1. Executive summary

Though Mauritius is not presently classified as a fishing nation for tuna species, however the tuna fishery forms the basis for the local fish processing industries. Tuna transhipment at Port Louis is another fish related activity. In 2010, a total of 592 calls of fishing vessels was registered and transhipped 43 723 tonnes of fish. The local longliner unloaded 306 tonnes of tuna and related species. Mauritius issued 225 licenses to foreign vessels to operate in its waters during 2010. Licences are issued to foreign longliners (mostly Asian) and purse seiners to operate in the Mauritian waters under a set of conditions which include the compliance of the vessels to international conservation and management measures, listing of the vessel in the Positive or Active lists of IOTC and mandatory VMS reporting.

The sport fishery also lands about 330 tonnes of pelagic fishes mostly for the local market. An artisanal tuna fishery has also been developed around fish aggregating devices. Mauritius is implementing all the recommendations of the Scientific Committee. All tuna statistics collected are processed and are transmitted to the IOTC regularly. It has also developed its NPOA-IUU. A Standard Operating Procedure (SOP) is under preparation for the implementation of the NPOA-IUU as well as the IOTC Regulation 10/11on Port State Measures (PSM) to prevent, deter and eliminate IUU fishing. The implementation of an effective PSM would help control the harvest of fish caught in the IOTC Area and thereby would ensure the long-term conservation and sustainable use of these resources and the marine ecosystems.

2. Background/General information on the fisheries sector in the Mauritian economy

Mauritius has developed a Seafood Hub for trading, warehousing, processing, distribution and re-export of fresh, chilled and frozen or value added seafood products. The Seafood Hub is defined as: **"**An efficient and attractive environment for the supply of value added processes and services related to the sourcing and marketing of sea food products**"**.

The strategy of the Seafood Hub is focused on the development of value added fisheries and seafood related sectors including fishing, transhipment, storage and warehousing, light processing (sorting, grading, cleaning, filleting and loinning), canning, ancillary services (ship

chandlling, bunkering, vessel husbandry, ship agency, ship building and repair). In terms of contribution to GDP, the fishery sector represents approximately 1.3 of the total GDP.

From the economic, nutritional and social stand points, fisheries are important sector in Mauritius. Although local fish production does not suffice to cover market needs, fishing and fish processing activities provide direct employment to about twelve thousand people and is quite an important foreign exchange earner. The per capita consumption of fish was 21.7 kg in 2010.

Export of canned tuna yielded around 10 billion rupees (209million Euros) in 2010. The 592 calls of fishing vessels registered in the port generating some 5 billion rupees (116 m Euros). During the same period value of local production including tuna fish amounted to an estimated 2 billion rupees (46 m Euros)

Table 1: Import and export of fish and fish products and trade balance

	Import	Export	Balance		
Year	Qty(t)	Value(MR)	Qty(t)	Value(MR)	Value(MR)
2005	104 830	4 265.7	67 249	4 842.1	580.9
2006	150 728	6 720.9	79 580	7 120.4	395.5
2007	129 085	7 068.0	86 170	8 172.8	1 104.8
2008	113 608	8 547.4	66 205	8 015.2	-532.2
2009	139 342	7 108.3	87 938	9 041.2	1 932.9
2010	155 000	7 810	104 740	10 118	2 308

Source: Central Statistics Office; MR* – Million rupees

3. Catch, Effort, Fleet

The tuna fishery is an important source of raw material to the processing factories and also important in the social and economic development of Mauritius. Tuna transhipment at Port Louis is another valuable fish related activity. The sport fishery also lands an important quantity of pelagic fishes mostly for the local market. An artisanal tuna fishery has also developed around fish aggregating devices placed around Mauritius and this sector provides the population with an important quantity of fish.

3.1 The local longline fishery

Presently, only one local vessel more than 24 m is operating under Mauritian flag. The vessel has a GRT of 577 tons and LOA of 48 m. The table below shows the number of vessels involved in this fishery for the past five years.

Table 2: Number of vessels by gear type and size

Year	Gear	Number of vessels	GT	LOA (m)
2006	Surface Longline	3	484-597	39.8-48
2007	Surface Longline	3	315-597	35.3-48
2008	Surface Longline	2	577-597	48
2009	Surface Longline	1	577	48
2010	Surface Longline	1	577	48

In 2010, it undertook 4 fishing trips and the catch unloaded amounted to 306 tonnes. The species composition of the landings is shown in table 3. Most of the catch was composed of swordfish (52.7 %). The catch per unit effort was 1.46 kg per hook. The fishing area was spread between latitudes 18º S and 34º S and longitudes 44º E and 70º E. The catch composition of these vessels from 2006 to 2010 is shown in table 3.

Table 3.Catch by species (tonnes) of local surface longliners (>24m) for the year 2006-2010

Species	2006	2007	2008	2009	2010
Yellowfin	9.1	21.5	52.5	0.9	3.6
Bigeye	22.9	9.3	5.5	2.1	4.2
Albacore	10.6	15.7	5	0.3	1.8
Swordfish	583	402	273	180	161
Other billfish	7.1	11.3	13	3.2	6.0
Misc	310.4	246	163	39.8	129
Total Catch	**943**	**706**	**512**	**246**	**306**

3.2 Semi-industrial pelagic chilled fish fishery

The number of boats involved in this fishery for the past five years by gear type and size is shown in the table below.

Table 4: Number of vessels by gear type and size

Year	Gear	Number of vessels	GT	LOA (m)
2006	Surface Longline	5	38.4-75	13.5-22.8
2007	Surface Longline	6	50.9-99.4	19.9-22.9
2008	Surface Longline	6	50.9-99.4	19.9-22.9
2009	Surface Longline	Nil	Nil	Nil
2010	Surface Longline	2	30.2-38.4	13.5-15.8

During 2010 two fishing boats (less than 24 meters) effected 21 trips and landed 32.22 tonnes of chilled fish. The length of these boats ranged from 16.3 to 22.9 metres and the GT varied between 30.2 and 38.41 tonnes. Most of the catch was composed of swordfish and yellowfin (53% and 23.6% respectively). The fishing areas were spread around Mauritius, between latitudes 19^0S and 20^0S and longitudes 57^0E and 60^0E. The catch and species composition are shown in table 5 below.

It is to be noted that during 2009 these vessels did not operate as they could not export the swordfish due to high level of mercury content in the sword fish.

Table 5.Catch composition (kg) of the local surface longliners (<24m)

Species	2006	2007	2008	2009	2010
Yellowfin	102 632	65 924	14 076	NA	7 621
Bigeye	15 444	-	-	NA	460
Albacore	40 840	56 416	14 570	NA	4 998
Swordfish	74 157	45 913	8 858	NA	17 070
Other billfish	1 590	2 156	163	NA	260
Shark	1 212	1 056	67	NA	-
Misc	4 873	6 264	1 462	NA	1 925
Total Catch	**247 256**	**184 326**	**41 379**	NA	**32 224**

3.3 Tuna catch by foreign licensed vessels

Licences are issued to foreign longliners (mostly Asian) and purse seiners to operate in the Mauritian waters under a set of conditions which include the compliance of the vessels to international conservation and management measures, listing of the vessel in the Positive or

Active lists of IOTC and mandatory VMS reporting. The majority of these vessels tranship their catch at Port Louis.

Licensed vessels are required to submit logbooks after each fishing trip. In 2010, a total of 161 logbooks were received. The total catch transhipped by these vessels amounted to 7 953 tonnes. The catch made in the Mauritian EEZ amounted to 4 187 tonnes.

3.3.1 Species composition of the catch of foreign licensed longliners

The catch and species composition of the licensed foreign longliners from 2006 to 2010 is shown in table 6 below.

Table: 6.Catch by species (tonnes) of licensed longliners for the year 2006-2010

Species	**2006**	**2007**	**2008**	**2009**	**2010**
Yellowfin	1712	2181	1735	1330	963
Bigeye	962	1362	1070	588	1020
Albacore	2971	1993	2024	4293	4094
Swordfish	2148	665	1273	335	269
Sailfish	44	-	115	122	192
Marlin	133	290	222	239	365
Skipjack	27	37	77	-	1
Sharks	958	62	669	167	107
Bluefin	7	-	-	-	3
Others	676	576	781	705	940
Total Catch	**9 638**	**7166**	**7 966**	**7 779**	**7 953**

The major part of the catch was composed of albacore tuna which was the target species of most of the Asian longliners. The volume of swordfish landed was low as no catch was unloaded from licensed European surface longliners which target mainly this species.

3.3.2 Spatial distribution of the catch of licensed longliners during 2010

The fishing area of the licensed longliners was spread widely in the Western Indian Ocean between 06º N and 34º S and 44º E and 82º E. However during certain periods of the year namely during October to February the zones between lat 09 Sº and 13 Sº, and longitudes 52 Eº and 59 Eº as well as latitudes between 17 Sº and 23 Sº and longitudes between 56 Eº and 61 Eº were more productive than other fishing areas.

4 Transhipment by tuna fishing vessels

A total of 43 723 tonnes of tuna and tuna-like species was transhipped at Port Louis by tuna fishing vessels and carriers which effected 454 and 27 calls respectively.. The species composition of the fish transhipped is shown in table 7. Albacore tuna constituted 54% of the total catch. An increase in the volume of yellowfin, bigeye and skipjack tuna transhipped was observed and this was due to transhipment effected by some European purse seiners which target mostly these species.

Table 7: Species composition of fish transhipped (t)

Year	Albacore	Yellow fin	Big eye	Skipjack	Sword fish	Bluefin	Marlin	Sailfish	Shark	Misc.	Total
2006	20307	1995	359	127	1935	230	243	131	1890	2017	**29 234**
2007	12 182	3 281	494	134	2 305	8	67	486	1881	3 110	**23 948**
2008	11 375	1 479	596	133	3 301	34	142	167	1 728	1 972	**20 927**
2009	21 627	2 003	574	2 363	2 111	11	203	147	1 328	4 721	**35 088**
2010	23 908	5 929	2 173	2 839	1 494	410	380	90	2432	4 068	**43 723**

5. Fish aggregating device fishery

Fish aggregating devices (FADs) were introduced in 1985 to facilitate fishing for pelagic resources in the outer-reef waters of Mauritius and Rodrigues. Twenty- four FADs are maintained around Mauritius. About 300 fishermen are involved in this fishery.

A system of data collection has been set up since 2008. Data are collected from 61 sites around the island. During 2010 catch from this sector amounted to 286 tonnes which was mainly composed of tuna.

6. Recreational Fishery

The sports fishery involves local recreational fishermen and tourists. It is an important activity for the tourism industry and various international big game fishing competitions are held every

year in Mauritius. The sports fishery supplies the local market with an additional estimated amount of about 330 tonnes of fish which include marlins, tuna, dolphin fishes and sharks.

7. ECOSYSTEM AND BYCATCH ISSUES

7.1. SHARKS

A NPOA-Shark is under preparation.

7.1.2 Volume of sharks transhipped

In 2010, a total of 2 432 tonnes of sharks was transhipped at Port Louis. The main species of sharks landed from licensed and non licensed vessels calling at Port Louis consisted of Blue shark (52.4%) and Moro shark. (46.4%) The species composition of sharks landed is shown at table 8.

Table 8: Species composition of sharks landed (tonnes)

Species	Blue shark	Moro shark	Mako shark	Others (Brown sharks, Onara sharks, Hammer sharks, Tiger sharks)
Qty unloaded	1 274	1128	27	3

7.2. SEABIRDS

A NPOA-Seabird would be considered after the finalization of the NPOA-Shark

8. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS

- Landing statistics and trip data are collected from the owners of vessels or fishing companies representing vessels in Mauritius.
- Length frequency sampling is conducted on the catches of licensed longliners during their landings. Length frequency data is also collected on the catches of the local swordfish fishing vessels.
- Presently, the software “FINSS” is not functional due to a problem with the database and all the data are being computerised in “Excel”.

8.1. Logsheet data collection and verification

Fishing logbooks are regularly distributed to local and licensed foreign vessels. Daily catch statistics are recorded by skippers on these fishing logbooks.

Logsheet is collected from all licensed fishing vessel when they come to port for unloading. The fishing positions mentioned in the logbook is verified against the positions reported by the vessel through the VMS. Unloading is authorized only when there has been no discrepancy.

8.2. Vessel Monitoring System

A Vessel Monitoring System was set up in 2005 with the following objectives:

- To assist in the identification of vessels fishing illegally without licence in Mauritius
- To identify licensed fishing vessels that may be fishing in contravention of their licence conditions
- To monitor the activities of Mauritian flagged vessels operating within the EEZ of other countries
- To provide a comprehensive record of the activities of all fishing vessels that wish to land fish in Mauritius for subsequent export in part fulfilment of Mauritius' port responsibilities.

The Vessel Monitoring System is being managed by a Fisheries Monitoring Centre (FMC) based at the Albion Fisheries Research Centre. The FMC is able to have near real time positions of the vessels, their course and speed. These information provide an important tool in the monitoring of the activities of the licenced vessel. The National Coast Guard is also equipped with an FMC Workstation to enable data to be obtained from the main FMC for policing purposes

The FMC can provide all position reports for one or more vessels over a given time and also allows the polling of individual or groups of vessels on command from the VMS operator.

The setting up of a Vessel Monitoring System has necessitated the promulgation of relevant Regulations to the Fisheries and Marine Resources Act of 1998 to make it mandatory for all licenced fishing vessels to be equipped with transponders that will send their GPS position every two hours to the FMC.

Table 9: Number of data reports received by the FMC

Year	No of data reports received
2005	29934
2006	119375
2007	239512
2008	258502
2009	278519
2010	317316

8.3. Observer programme

Eight officers were trained as observers, five under the SWIOP and the other three under the IOC- MCS project. Trained observers to embark on board foreign and local fishing vessels are under consideration.

8.4. Port sampling programme

Regular samplings for the collection of length frequency data are carried out on the catches of licensed local and foreign longliners which target mainly tuna and swordfish. The species, fishing positions and length of fish are noted. These data are collected, compiled and transmitted to the IOTC.

8.4.1 Sampling of catch from licensed longliners

Length frequency data of the albacore tuna were obtained during samplings carried out on the catch of licensed longliners in 2010.

- A total of 2 201 albacore tuna was sampled. The length ranged from 68 to 125 cm. 42 % of the catch consisted of fish in the length range of 96 to 103 cm. Figure 1 gives the length frequency distribution of albacore tuna sampled in 2010.

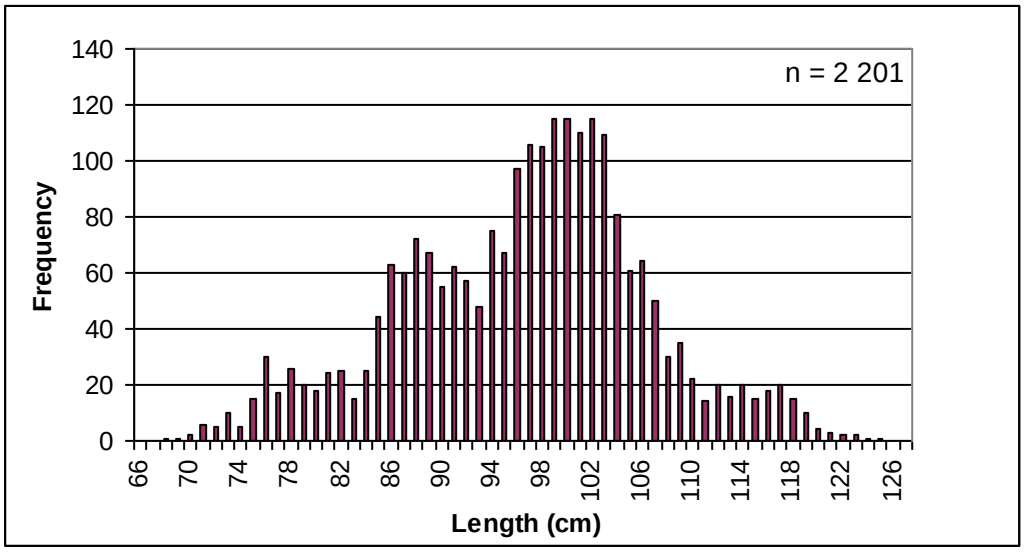

Figure 1: Length frequency distribution of albacore tuna

9. IMPLEMETATION OF SCIENTIFIC COMMITTEE RECOMMENDATIONS AND RESOLUTIONS OF THE IOTC RELEVANT TO THE SC

Mauritius transmits to IOTC data regularly and these include:

(a) Catch and effort of the local and foreign fishing vessels

(b) Length frequency data of the licensed foreign longliners transhipping at Port Louis

(c) Vessels characteristics for the vessel Registry

(d) Data on transhipment and calling of vessels

Catch and effort data of local and licensed foreign longliners are compiled and processed on one degree square.

9.1 Data on Port Inspection

A Port Inspection Unit based at the port is operational since June 2004. Data are collected in line with FAO Model Scheme on Port State Measures. In this regard three types of forms have been designed. All vessels calling to the port have to inform the port authority 72 hours in advance and have to provide data on catch, vessel characteristics and purpose of call. On arrival of vessels, inspections are carried out. All vessels have to submit copies of registration certificate, licence details, list of crew, fishing positions (logbooks), catch details, vessel characteristics. IUU listed vessels are not authorized to land their catch at Port Louis. During 2010, in all 592 calls of foreign fishing vessels were registered.

9.2 Resolution 10/06 on Reducing the Incidental Bycatch of Seabirds in Longline Fisheries

With regards to Resolution 10/06 on Reducing the Incidental Bycatch of Seabirds in Longline Fisheries, the companies representing the longline fishing vessels were directed to inform operators that all vessels fishing south of the parallel of latitude 30^{o} South have to carry and use bird-scaring lines (Tori lines).

9.3 Resolution 09/06 on Marine Turtles

The Mauritian Fisheries and Marine Resources Act 1998 (FMRA) provides the necessary legal framework for the protection of any marine turtle, marine turtle egg. Furthermore in connection with the resolution on the reduction of impacts of the mortality of sea turtles by longline fleets, the representatives of the fishing companies have been informed that the operators of all longline vessels have to carry line cutters and de-hookers in order to facilitate the appropriate handling and prompt release of marine turtles caught or entangled.

10. LITTERATURE CITED

- *Annual Report 2010, Ministry of Fisheries and Rodrigues*
- *Statistical Bulletin (Central Statistical Office)*