

**IOTC Thirteenth Session of the Scientific Committee
Mahé, Seychelles, 6-10 December 2010**

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 9 November 2010

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1. Abstract

The tuna fishery forms the basis for local fish processing industries. Tuna transshipment at Port Louis is another important fish related activity. In 2009, a total of 604 call of fishing vessels was registered and volume transhipped amounted to 35 087 tonnes of fish. The local longliner unloaded 246 tonnes of tuna and related species. Mauritius issued 192 licenses to foreign vessels to operate in its waters during 2009. The sport fishery lands about 350 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 using FINNS and are transmitted to the IOTC regularly. Mauritius has also developed its NPOA-IUU to prevent, deter and eliminate IUU fishing.

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

In Mauritius, the tuna fishery forms the basis for local fish processing industries and is a valuable contributor to its social and economic development. Tuna transshipment at Port Louis is another important fish related activity. The sport fishery also lands 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.

Mauritius aims at developing a Seafood Hub for trading, warehousing, processing, distribution and re-export of fresh, chilled and frozen or value added seafood products.

The strategy of the Seafood Hub is focused on the development of value added fisheries and seafood related sectors including fishing, transshipment, 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).

Export of canned tuna yielded around 9 billion rupees (209million Euros) in 2009. In all 604 calls of fishing vessels were 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) Export of fish and fish products during 2003-2009 is shown in Table I. In terms of contribution to GDP, the fishery sector represents approximately one per cent of the total GDP.

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

Year	Import		Export		Balance
	Qty(t)	Value (MR)	Qty(t)	Value (MR)	Value (MR)
2003	62 323	2 560.1	48 719	3 178.4	618.3
2004	80 943	3 170.1	54 241	3 358.1	188.0
2005	104 830	4 265.7	67 249	4 842.1	580.9
2006	150 728	6 720.9	79 707	7 120.4	395.5
2007	129 085	7 068.0	86 170	8 170.8	1 104.8
2008	148 651	8 474.3	83 482	7 931.7	-542.6
2009	139 342	7 108.3	87 938	9 041.2	1 932.9

MR – Million rupees

From the economic, nutritional and social stand points, fishery is an 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 kg in 2009.

3. Catch and Effort of local Fleet

3.1 The local longline fishery

Out of the three local longliners above 24 meters in operation until recently, two are no more under the Mauritian flag. The third one which is in operation has a GRT OF 577 tons and LOA of 48 m.

In 2009, it undertook 2 fishing trips and the catch unloaded amounted to 246 tonnes. The species composition of the landings is shown in figure 3. Most of the catch was composed of swordfish (73.4 %). The catch per unit effort was 1.45 kg per hook. The fishing area was spread between latitudes 21° S and 30° S and longitudes 58° E and 88° E. The catch and CPUE of these vessels from 2006 to 2009 is shown in table 2 and figure 1.

Table 2. Catch by species (tonnes) of local surface longliners (>24m) for the year 2006-2009

Species	2006	2007	2008	2009
Yellowfin	9.1	21.5	52.5	0.9
Bigeye	22.9	9.3	5.5	2.1
Albacore	10.6	15.7	5	0.3
Swordfish	583	402	273	180
Other billfish	7.1	11.3	13	3.2
Misc	310.4	246	163	39.8
Total Catch	943	706	512	246
Total no. of hooks	656 428	681 540	465 678	169 440
CPUE (kg)	1.44	1.04	1.09	1.45

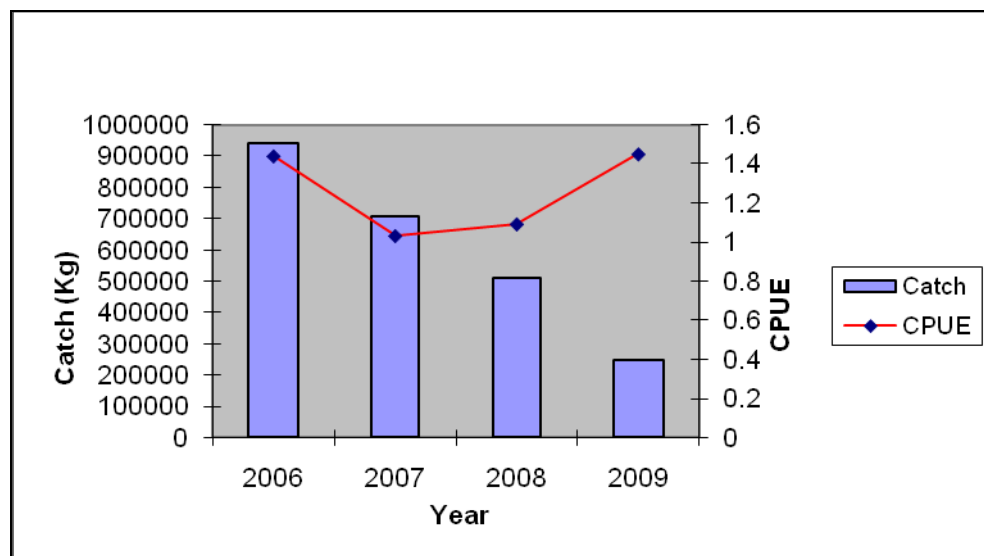


Fig 1: Catch and CPUE trend of local surface longliners (>24m)

3.2 Semi-industrial pelagic chilled fish fishery

During 2008 five fishing vessels (less than 24 meters) effected 23 trips and landed 41.37 tonnes of chilled fish. The length of these vessels ranged from 16.3 to 22.9 metres and the GRT varied between 49.5 and 99.4 tonnes. Most of the catch was composed of albacore and yellowfin (35.2% and 34% respectively). The fishing areas were spread around Mauritius, between latitudes 10⁰S and 23⁰S and longitudes 56⁰E and 61⁰E. The species composition, catch and CPUE trend are shown in table 3 and figure 2 below.

However, during 2009 these vessels did not operate as they could not export the swordfish due to high level of mercury content in the fish.

Table 3. Catch composition (kg) of the local surface longliners (<24m)

Species	2006	2007	2008
Yellowfin	102 632	65 924	14 076
Bigeye	15 444	-	-
Albacore	40 840	56 416	14 570
Swordfish	74 157	45 913	8 858
Other billfish	1 590	2 156	163
Shark	1 212	1 056	67
Misc	4 873	6 264	1 462
Total Catch	247 256	184 326	41 379
Total no. of hooks	522 705	443 445	201 782
CPUE (kg)	0.47	0.42	0.21

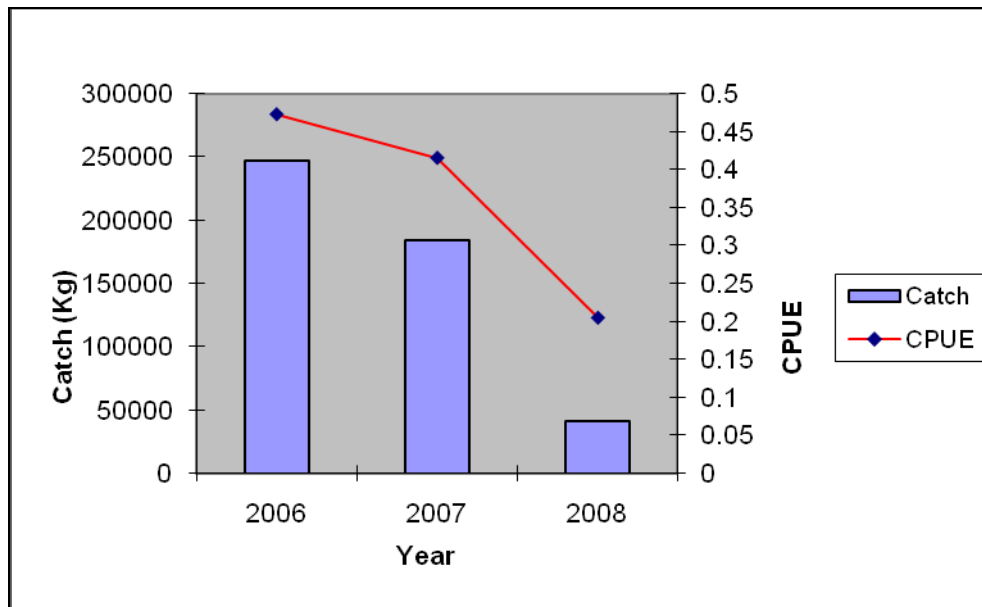


Fig 2: Catch and CPUE trend of local surface longliners (<24m)

During 2008, all swordfish and albacore tuna unloaded by these boats were measured. The length of the swordfish measured from the operculum to keel ranged between 43 to 172 cm with the majority between 69 and 120 cm. The length of the albacore tuna measured ranged from 95 to 124 cm.

3.3 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 2009 catch from this sector amounted to 390 tonnes which was mainly composed of tuna.

3.4 Sports 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 350 tonnes of fish which include marlins, tuna, dolphin fishes and sharks.

4. 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 2009, a total of 121 logbooks were received. The total catch transhipped by these vessels amounted to 7 779 tonnes. The catch made in the Mauritian EEZ amounted to 5 254tonnes. These vessels had utilised 15 169 608 hooks and the catch per unit effort was 0.51 kg per hooks

4.1 Species composition of the catch of foreign licensed longliners

The catch, species composition and CPUE trend of the licensed foreign longliners from 2006 to 2009 is shown in table 4 and figure 3 below.

Table: 4.Catch by species (tonnes) of licensed longliners for the year 2006-2009

Species	2006	2007	2008	2009
Yellowfin	1712	2181	1735	1330
Bigeye	962	1362	1070	588
Albacore	2971	1993	2024	4293
Swordfish	2148	665	1273	335
Sailfish	44	-	115	122
Marlin	133	290	222	239
Skipjack	27	37	77	-
Sharks	958	62	669	167
Bluefin	7	-	-	-
Others	676	576	781	705
Total Catch	9 638	7166	7 966	7 779
Total no. of hooks	14 541 569	15 592 783	14 633 450	15 169 608
CPUE (kg)	0.66	0.46	0.54	0.51

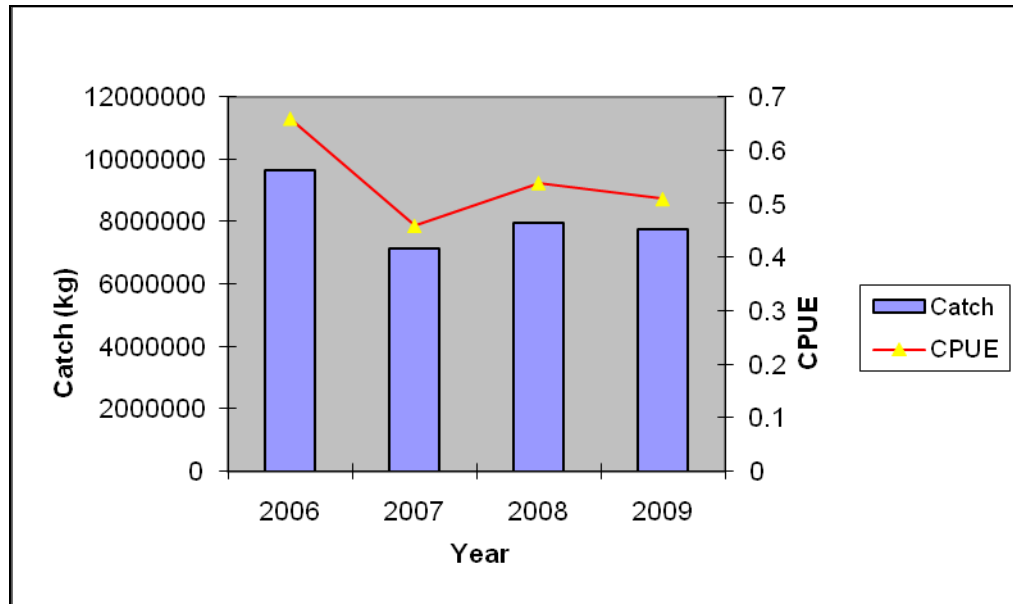


Fig 3: Catch and CPUE trend of foreign longliners

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.

4.2 Spatial distribution of the catch of licensed longliners during 2009

The fishing area of the licensed longliners was spread widely in the Western Indian Ocean between 08° N and 37° S and 42° E and 86° E. However during certain periods of the year namely during October to February the zones between lat 08 S° and 13 S° and longitudes 54 E° and 60 E° as well as latitudes between 18 S° and 23 S° and longitudes between 56 E° and 62 E° were more productive than other fishing areas.

4.3 Sampling of the catch of licensed longliners (2009)

Length frequency data of the albacore tuna were obtained during regular samplings carried out on the catch of licensed longliners. A total of 2 892 albacore tuna was sampled. The length frequency distribution is shown in figure 4. The length varied from 69 to 128 cm. The major part of the catch comprised fish in the range of 95 to 106 cm.

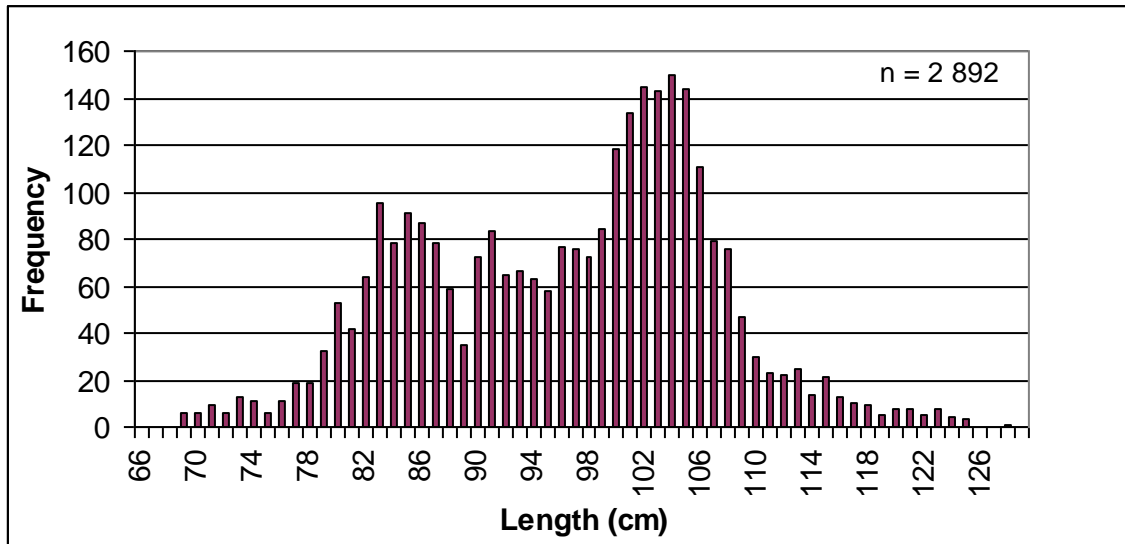


Figure 4: Length frequency distribution of albacore tuna

4.4. Transshipment by tuna fishing vessels

A total of 35 087 tonnes of tuna and tuna-like species was transhipped at Port Louis by tuna fishing vessels and carriers which effected 336 and 29 calls respectively. The species composition of the fish transhipped is shown in table 5. Albacore tuna constituted 62% of the total catch. An increase in the volume of yellowfin and skipjack tuna transhipped was observed and this was due to transshipment effected by some European purse seiners which target mostly these species.

The percentage of the three main species which were transhipped is shown in figure 5.

Table 5: Species composition of fish transhipped (t)

Year	Albacore	Yellowfin	Bigeye	Skipjack	Swordfish	Bluefin	Marlin	Sailfish	Shark	Misc.	Total
2003	6 225	1 280	415	25	2 126	3	187	59	1 657	456	12 433
2004	4 633	4 110	1 361	3	1 595	1	172	6	2 022	352	14 255
2005	4 947	3 887	1 413	-	3 357	-	318	35	2 473	1 237	17 667
2006	20306.5	1995.3	358.6	126.8	1934.5	229.6	242.5	130.6	1890.1	2017.1	29 231
2007	12 182	3 281.2	494.4	133.6	2 304.8	8.4	67.2	486.3	1881.1	3 110.2	23 955
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	35 087

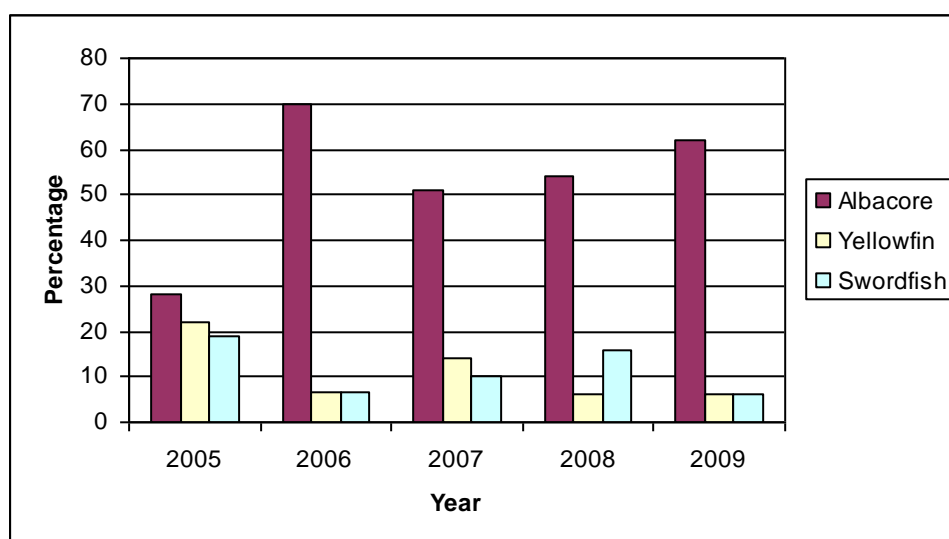


Fig 5: Percentage of the three main species transhipped by longliners

4.5 Volume of sharks transhipped

In 2009, a total of 1 328 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 6.

Table 6: Species composition of sharks landed (tonnes)

Species	Blue sharks	Moro sharks	Mako sharks	Others (Hammer-head sharks, Tiger sharks, etc)
Qty unloaded	695	616	12	5

4.6 Licenses

Licences are issued to foreign fishing vessels either under Fishing Agreements between Mauritius and other States or to individual fishing vessels.

4.7 Licences issued under fishing agreements

Mauritius has fishing agreements with the Government of Seychelles and the Federation of Japan Tuna Fisheries Co-operative Associations (FJTFCOA). All tuna fishing vessels fishing in the Mauritius EEZ are listed with the Indian Ocean Tuna Commission.

During 2009, forty-nine licences were issued to tuna fishing vessels under fishing agreements. The licences of 9 vessels under fishing agreements

were also extended. Table 6 shows the number of licences by category issued under Fishing Agreements.

Table 7: Licences issued to foreign fishing vessels under fishing agreements

Fishing agreement	Purse seine licences	Longline licences
Seychelles	19	6
FJTFCFA	-	24

4.8 Fishing licence to other foreign vessels

Fishing licences were also issued to fishing vessels of various nationalities outside fishing agreements. The types of licences given are mainly longline and purse seine licences.

During 2009, one hundred and forty-three licences were issued to vessels of various nationalities. In addition, 41 extensions of licences were granted to some of these vessels. Out of these 143 licences, 101 licences were issued to longline fishing vessels, 42 were issued to purse seiners.

4.9 Licences issued to foreign fishing vessels over the last five years

Table 8 shows the categories and number of licences issued to foreign fishing vessels over the last five years. An increase in the number of foreign licences issued in 2009 is noted as compared to 2008. This may be

attributed mainly to a resumption of the issuing of licences to European Community vessels.

Table 8: Licences issued to foreign vessels by gear type (2005 – 2009)

Year	Surface Longliner	Purse seiner	Trawler	Total
2005	178	39	0	217
2006	186	43	2	231
2007	144	59	0	203
2008	86	16	0	102
2009	131	61	0	192

4.10 National Plan of Action to prevent, deter and eliminate IUU Fishing

A National Plan of Action to prevent, deter and eliminate IUU Fishing has been set up and the measures are being implemented after approval of the plan by the Government. The plan addresses among others the responsibilities of Mauritius as a State, flag State, coastal State and port State. It also provides market related measures, supporting actions and the role of RFMOs to combat IUU fishing.

5. Measures taken to implement recommendations of the Scientific Committee

5.1 Resolution 10/01 For the Conservation and Management of Tropical Tunas Stocks in the IOTC Area of Competence.

The local vessels have been informed accordingly

5.2 Resolution 10/02 Mandatory Statistical Requirement for IOTC Members and Cooperating non Contracting Parties (CPC's)

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 catches of the swordfish fishing vessels;
- (c) Length frequency data of the licensed foreign longliners transshipping at Port Louis
- (d) Vessels characteristics for the vessel Registry
- (e) Data on transshipment and calling of vessels

Catch and effort data of local and licensed foreign longliners are compiled and processed on 1⁰ degree square.

5.3. Resolution 10/03 concerning the recording of catch by fishing vessels in the IOTC area

It is mandatory for local and foreign licensed vessels to submit fishing logbook after each fishing campaign. The details in the logbook are in accordance with the IOTC format.

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

The companies representing the longline fishing vessels have been informed accordingly.

5.5. Resolution 10/07 Concerning a Record of Licensed Foreign Vessels Fishing for Tunas and Swordfish in the IOTC Area.

Data have been submitted to the IOTC

5.6. Resolution 10/08. Concerning a Record of Active Vessels Fishing for Tunas and Swordfish in the IOTC Area.

Data have been submitted

5.7. Resolution 10/10 Concerning Market Related Measures

Data have are being compiled and will be submitted to IOTC shortly

5.8. Resolution 10/11 On Port state measures to prevent, deter and eliminate illegal, unreported and unregulated fishing

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 2009, in all 604 calls of foreign fishing vessels were registered.

5.9 Port sampling to collect length frequency data on longline catch

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. Species, fishing positions and length of fish are noted. These data are collected, compiled and transmitted to the IOTC.

5.10 Support for tagging programme

In Mauritius, so far 1157 tags have been recovered from the two processing plants namely Princes Tuna Canning Factory and Thon des Mascareignes Ltd and agents of vessels calling at Port- Louis. Agents and Freeport operators were sensitized for the importance of tag recoveries.

During 2009 and 2010 to date a total 102 tags and 30 tags were recovered respectively.

5.11 Vessel Monitoring System (VMS)

A VMS was established in 2005 to better monitor the activities of fishing vessels in the EEZ of Mauritius. Specific regulation has been prescribed so that all local and foreign licensed vessels have to report to the Fisheries Monitoring Centre (FMC) every two hours on fishing positions, speed and directions. The VMS data are also used to verify the fishing positions found in the logbooks

In 2009, 264 local and foreign fishing vessels reported to the Fisheries Monitoring Centre.

5.12 Monitoring of foreign fishing vessels

Foreign fishing vessels call at the port for different activities such as landing of catch, transshipment, bunkering, change of crew, provisions and repairs. The number of calls by these vessels varied from 568 to 801 during the past five years as shown in table 9.

Table 9: Calls of foreign fishing vessels at Port Louis

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2005	61	69	55	36	45	68	54	44	83	75	50	66	706
2006	78	86	36	41	59	66	79	59	109	68	44	76	801
2007	82	44	29	47	48	50	66	41	79	52	51	75	664
2008	50	40	48	33	45	67	53	39	64	30	43	56	568
2009	62	68	38	32	57	40	31	40	96	29	54	57	604

6. National Data Collections and Processing of Statistical Data

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

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 foreign longliners during their landings. Length frequency data is also collected on the catches of the local swordfish fishing vessels.

All the data are computerized using the software “FINSS”. Processing of logbook data to produce catch in EZZ is now effected through “FINSS”.