

## India's National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2014

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### INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

<p>In accordance with IOTC Resolution 10/02, final scientific data for the previous year was provided to the Secretariat by 30 June of the current year, for all fleets other than longline. (e.g. for a National report submitted to the Secretariat in 2013 final data for the 2012 calendar year must be provided to the Secretariat by 30 June 2014)</p>	<p>YES vide our letter to IOTC No. 43-6/2003 F-II. Dated 11.09.2014</p>
<p>In accordance with IOTC Resolution 10/02, provisional longline data for the previous year was provided to the Secretariat by 30 June of the current year. (e.g. for a National Report submitted to the Secretariat in 2013, preliminary data for the 2012 calendar year was provided to the Secretariat by 30 June 2014)</p>	<p>YES vide our letter to IOTC No. 43-6/2003 F-II. Dated 11.09.2014</p>
<p>If no, please indicate the reason(s) and intended actions</p>	

**EXECUTIVE SUMMARY**

In India, fishing is an age-old practice, besides providing protein rich food and employment to more than 6 million fishermen, this sector provides export earnings of about 30,213.26 crores of rupees to the country. Marine fish landings of the country have increased from a modest of 0.5 million tonnes during 1950 to 3.44 million tonnes during 2013-14 (MOA, 2014). Major share of the fish landings in India, where a multi species, multi gear fishery exists is from the coastal fishery (Sajeevan and Nair, 2006). Neritic Tuna form a significant share of pelagic fishery and oceanic fishery is mainly consists of Tuna and Tuna like fishes.

Tuna fishery in India consists of both targeted longliners and multipurpose coastal fishing fleets. India's tuna fishing fleet includes traditional, motorized and mechanised boats operating various traditional gears, small pole and line boats, small longliners and industrial longliners. Except the Industrial tuna long liners and pole and line boats other fishing fleets are aimed at multi species fishery. Tuna and allied resources also caught by these fleets as by-catch. The total production of tunas and tuna-like fishes, including neritic and oceanic tunas, billfishes and seerfishes during the year 2013 was 192,777 tonnes against a total production of 179,625 tonnes during the year 2012 (Premchand *et al.*, 2013). An increase in the tuna landings by the oceanic fishery and decrease in the landings of coastal fishery sector was noticed during the year under report.

Yellow Fin Tuna with 56.67% by weight to the total catch dominated the catches recorded in the oceanic resource survey conducted by the Fishery Survey of India in the EEZ indicates the abundance of the target fish in the Indian EEZ.

Data on tuna production is collected by different agencies in India including Fishery Survey of India (FSI), Central Marine Fisheries Research Institute (CMFRI) and Marine Products Export Development Authority (MPEDA). Policy decisions on fishery management are being formulated by the Department of Animal Husbandry, Dairying and Fisheries (DAHD&F), Ministry of Agriculture, Government of India.

## CONTENTS

S. No	Topic	Page No
i	Executive Summary	2
ii	Contents	3
1	Background/General information on fishery	4
2	Fleet structure	4
3	Catch and effort by species, area and gear	6
3.1	By coastal fishery	6
3.2	By oceanic fishery	7
4	Recreational fishery	10
5	Ecosystem and bycatch issues	10
5.1	Sharks	10
5.2	Sea birds	10
5.3	Marine turtles	10
5.4	Other ecologically related species	11
6	National data collection and processing systems	11
6.1	Log Sheet data collection and verification	11
6.2	Vessel Monitoring System	11
6.3	Observer Programme	12
6.4	Port Sampling Programme	12
6.5	Unloading/Transshipment	12
7	National Research Programmes	12
8	Implementation of Scientific Committee Recommendations and Resolutions of the IOTC Relevant to the SC	14
9	Conclusion	16
10	Literature cited	17

## **1. BACKGROUND/GENERAL INFORMATION ON FISHERY**

India's tuna fishery consists of Coastal fishery, Oceanic fishery, small scale longliners and industrial longline fishery. Coastal fishery is mainly composed of traditional, motorized and mechanised boats operating a number of traditional gears. Oceanic fishery is represented by the artisanal pole and line fishery based at the Lakshadweep group of Islands. Small-scale longliners mainly composed of shrimp trawlers-converted-tuna-longliners targeting fresh tuna within the EEZ. Major share of industrial longline fishery are the Indian owned tuna longline vessels operating under Letter of Permission Vessels (LOP vessels).

The total production of tunas and tuna-like fishes, including neritic and oceanic tunas, billfishes and seerfishes during the year 2013 was 192,777 tonnes against a total production of 179,625 tonnes during the year 2012. There was an increase in the catch by the oceanic fishery and decrease in the tuna landings by coastal sector during the year under report.

## **2. FLEET STRUCTURE**

The coastal fishery has a diverse assemblage of small fishing boats, mainly gillnetters, mini purse-seiners, ring-seiners, hook and line boats etc., which are not targeting tunas, but contribute significantly to the tuna landings.

Pole and line boats, numbering 365 are engaged in targeted fishing for tunas (mainly skipjack) in the Lakshadweep waters (South-east Arabian Sea). The tunas caught by pole and line fishery is used mainly for preparation of Masmeen, a cooked, smoked and sun dried tuna delicacy in the Lakshadweep.

Government of India, the Ministry of Agriculture, as a measure to reduce the fishing pressure on the coastal resources provided financial assistance to the coastal trawlers during the

10th five year plan (2002–2007) of India for conversion of existing trawlers (mainly shrimp trawlers) above 20 m OAL for tuna longlining operation. This was done under the centrally sponsored scheme “Development of marine fisheries, infrastructure and post-harvest operations”. Under this scheme, ten shrimp trawlers in the size range of 21.5–24.0 m OAL were converted for tuna longlining. Encouraged by the success of the said scheme The Marine Products Export Development Authority (MPEDA) also introduced a scheme for providing financial assistance to existing vessels for conversion to tuna longline fishing. Under the scheme, 225 vessels in the size range of 13 – 24 m OAL have availed assistance and converted for tuna longline fishing. The small scale tuna longliners of India are mainly composed of these converted trawlers.

The Industrial tuna longline vessels are mainly composed of the LOP vessels. Under the Letter of Permission (LOP) scheme of the Ministry of Agriculture, 52 tuna longline vessels in the range of 21.6 - 58.7 m OAL, and 7 hook & line vessels which are of foreign origin, but registered as Indian vessels (Indian owned vessels), have been permitted for fishing in the Indian waters. In addition to this there are four research vessels are engaged in oceanic tuna longline fishery. The structure of the oceanic tuna fleet is given in table 1. All the converted tuna longline vessels are using monofilament longlining system.

Table 1: Structure of tuna longline and Hook & Line fleet in India: 2013

Length range (m)	Indian owned vessels		Converted vessels	Total
	Hook & Line	Longline		
12-15.9			147	147
16-19.9		2	66	68
20-23.9	2	19	11	32
24-39.9	5	4	1	10
40-59.9		14		14
Un specified		17		17
<b>Total</b>	<b>7</b>	<b>56</b>	<b>225</b>	<b>288</b>

### 3. CATCH AND EFFORT BY SPECIES, AREA AND GEAR

#### 3.1 By coastal fishery

India's coastal fishery landed 136,659 t of tunas and allied species during 2013. The production from the Fishing Areas 51 and 57 was 81989 t and 54670 t (Table 2), i.e., 60% and 40% respectively. About 72% of skipjack tuna and 73% of yellowfin tuna caught by the coastal fishery was from the area 57. However, neritic tuna landings from the fishing area 51 were higher than that from area 57.

The tuna fishery was supported by ten species; three oceanic species and seven neritic species. Oceanic species formed 26.68% and neritic species 73.32%. Among the oceanic species, yellowfin and skipjack were dominant contributing 68.89% and 31.11% respectively. Among the neritic tunas, kawakawa was dominant (63.58%) followed by longtail tuna (20.97%),

Table 2. Nominal catch (t) of tuna and tuna-like fishes from the coastal fishery in India: 2013

Species	FAO Area 51	FAO Area 57	Total
Skipjack Tuna	1952	5126	7078
Yellowfin Tuna	3741	11932	15673
Bullet Tuna	2801	269	3070
Dogtooth Tuna	1	-	1
Frigate Tuna	1752	2901	4653
Kawakawa (Little Tuna)	25644	14092	39736
Longtail Tuna	13118	-	13118
Striped Bonito	1450	510	1960
<b>Tunas total</b>	<b>50459</b>	<b>34830</b>	<b>85289</b>
Marlin	1283	2041	3324
Sailfish	2135	2352	4487
Swordfish	1756	79	1835
<b>Billfishes Total</b>	<b>5174</b>	<b>4472</b>	<b>9646</b>
Indo Pacific Seerfish	9544	5383	14927
Narrow-Barred seerfish	16788	9973	26761
Wahoo	24	12	36
<b>Seerfishes Total</b>	<b>26356</b>	<b>15368</b>	<b>41724</b>
<b>Grand total</b>	<b>81989</b>	<b>54670</b>	<b>136659</b>

Table 3. Gear wise nominal catch (in tonnes) of tuna and tuna like fishes from the coastal fishery in India: 2013

Name of Species	Bag net	Gill net	Gill net / Hooks & Lines	Hooks & Lines	Purse seine	Ring seine	Trawl net	Trawl net / Hooks & Lines	Others
Bullet Tuna		240	50	2463	195	117	5		
Frigate Tuna		3043	39	433	401		33		13
Kawakawa (Little Tuna)		10447	895	1974	15771	691	992	358	18
Dogtooth tuna			1			9281			
Skipjack Tuna		5520	771	306			267	1	
Striped Bonito		1480	21	323		213	134		2
Yellowfin Tuna		8624	2734	2670			1029	131	485
Longtail Tuna		11939	48	24	635		451	21	
Sailfish	1	2444	907	1120	1		8	6	
Black Marlin		947	973	1399			5		
Swordfish		576	1071	22	16		150		
Wahoo		14	21	1					
Narrow-Barred Seerfish	73	16406	366	2611	739	810	5404	327	25
Indo-Pacific Seerfish	538	10102		492	94	83	3602	3	13
<b>Total</b>	<b>612</b>	<b>71782</b>	<b>7897</b>	<b>13838</b>	<b>17852</b>	<b>11195</b>	<b>12080</b>	<b>847</b>	<b>556</b>

### 3.2 Oceanic tuna fishery

The nominal catch of tunas and allied species from the oceanic fishery was 56118.87 tonnes (Table 4, Fig. 1 & 2). The catch was dominated by Skipjack Tuna, contributing 48.49% to the total followed by Yellowfin Tuna (33.76%) and sharks (8.03%). Contribution of billfishes to the total catch was marginal. Indo-pacific sailfish is the dominant billfish species in India (Sajeevan, 2013).

Gear-wise, small longliners with 70.48% of total catch contributed maximum catch from the oceanic sector. The fishery is concentrated mainly in the South-east and South-west coasts. Catch from this sector was 39551.71, dominated by yellowfin (39.02%) followed by Skipjack Tuna (36.05%).

Total landing by pole and line fishery based at Lakshadweep was 16525.7 tonnes. Catch consisted of Skipjack (78.37%) and Yellowfin (21.13%). Total catch reported by industrial tuna fishery was 17.24 tonnes.

Table 4. Nominal catch of tunas and allied species (t) from the oceanic fishery

<b>Species/group</b>	<b>Small longline /other gear (MT)</b>	<b>Pole and line (MT)</b>	<b>Industrial tuna longliner (MT)</b>	<b>FSI vessels (exploratory) (MT)</b>	<b>Total</b>
Yellowfin Tuna	15433.32	3491.88	6.03	13.67	18944.9
Skipjack tuna	14259.08	12951.2		0.04	27210.32
Bigeye Tuna				0.02	0.02
Frigate Tuna	874.8	41.32			916.12
Little Tuna	1428.22	41.32			1469.54
Longtail Tuna	858.71				858.71
Indo Pacific Sailfish	69.55		9.9	0.77	80.22
Marlin	70.42		0.34	0.91	71.67
Swordfish	90.33		0.09	0.63	91.05
Sharks	5213.36		0.88	7.27	5221.51
Seer fish	1254				1254
Barracuda				0.1	0.1
Wahoo				0.04	0.04
Others				0.67	0.67
<b>TOTAL</b>	<b>39551.79</b>	<b>16525.7</b>	<b>17.24</b>	<b>24.12</b>	<b>56118.87</b>



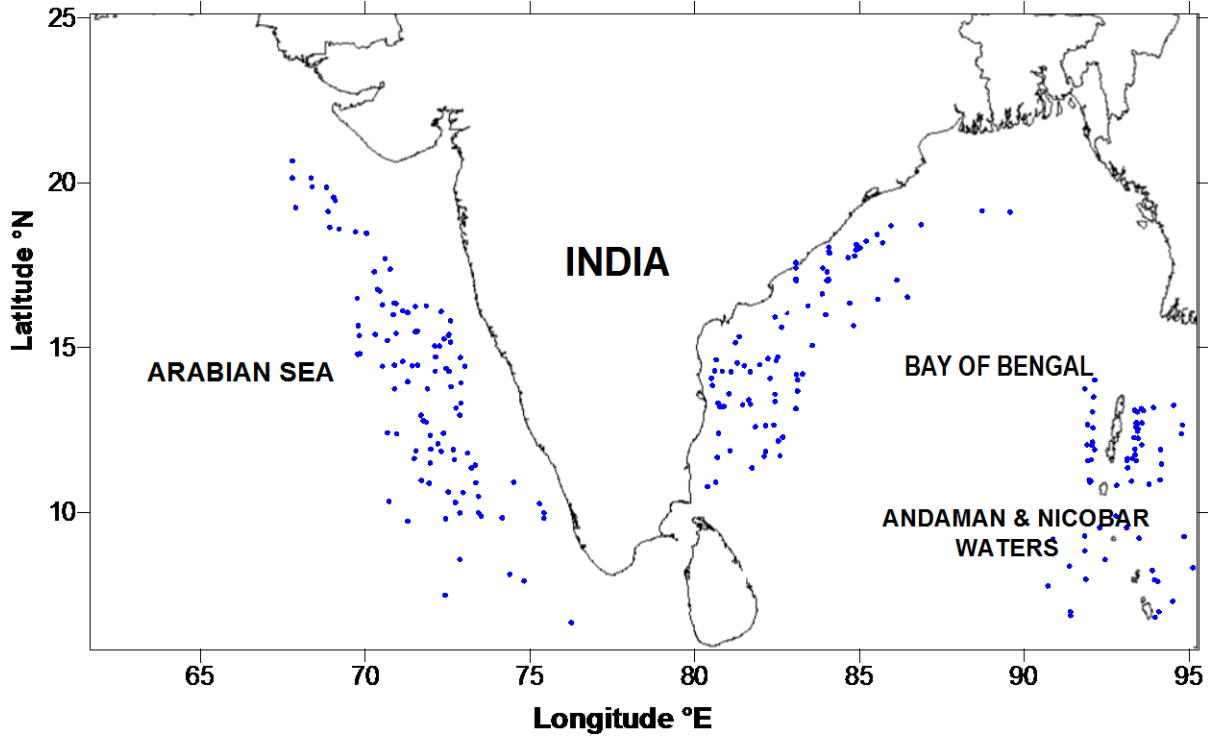


Fig. 1. Map showing distribution of fishing effort (fishing station) by Oceanic longline fishery

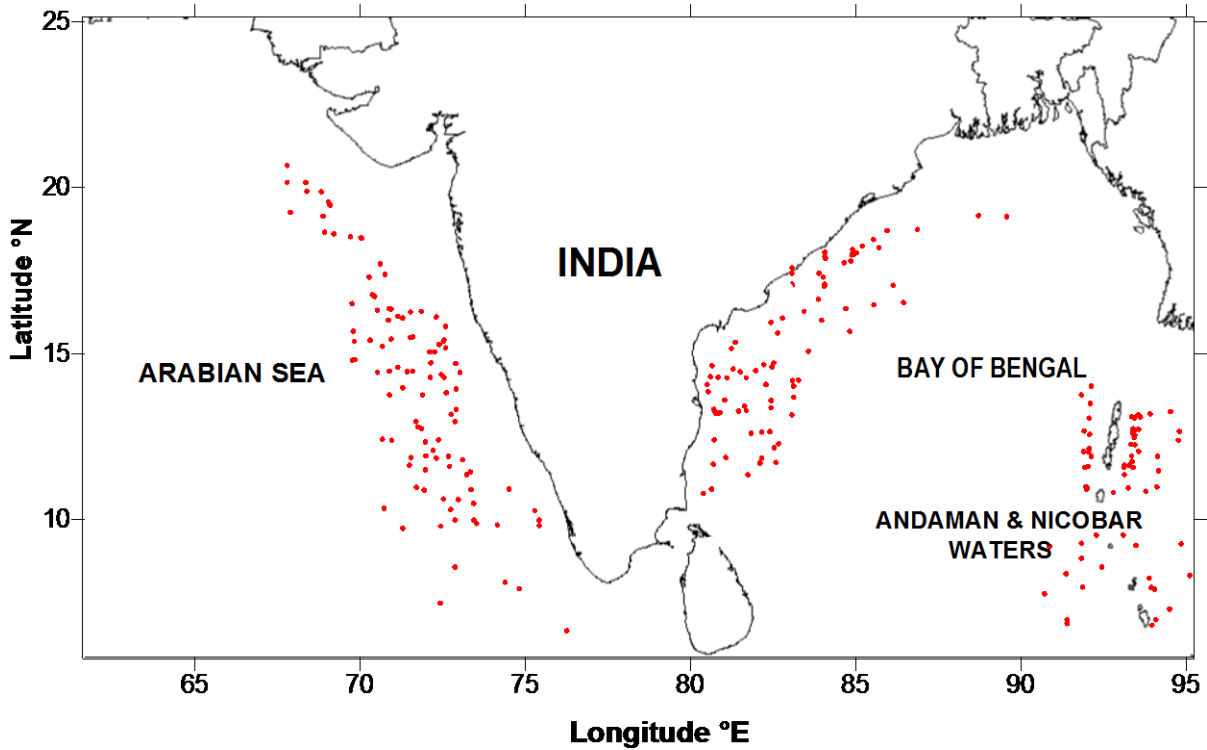


Fig. 2. Map showing Yellowfin tuna catch distribution by oceanic tuna fishery

#### **4. RECREATIONAL FISHERY**

In India, there is a scope for large scale recreational fishery for tunas and allied species. However, presently there is no commercial recreational fishery exist in India.

#### **5. ECOSYSTEM AND BYCATCH ISSUES**

##### **5.1 Sharks**

Results of fishery resource survey conducted by the Fishery Survey of India in the EEZ revealed that sharks constitute 30.14% by weight to the total catch in the longline fishery. However, the reported catch of sharks by industrial longline fishery is negligible. In India, many of the shark species are protected under the Indian national law. A National Plan of Action for Conservation of Sharks (NPOA-sharks) and also a Regional Plan of Action, jointly by Bangladesh, India, Maldives and Sri Lanka are being contemplated. Consultations are in progress.

##### **5.2 Seabirds**

There were no reported instances of sea bird interaction in any of the Indian tuna fishery. Indian vessels are not engaged in tuna fishing in the Southern Indian Ocean where the sea bird interactions are significant.

##### **5.3 Marine Turtles**

Sea turtles are protected in India, being included in the Schedule I of The Indian Wildlife (Protection) Act 1972. Studies conducted by Fishery Survey of India indicated that, the observed hooking rate of sea turtles in the longline fishery of Indian EEZ is 0.108 turtle/1000 hooks (Varghese et al., 2010). This rate is remarkably lower than many of the studies conducted in other areas. However, Indian longline vessels are advised to carry dehookers and line cutters

while on fishing operations and pamphlets on safe release of sea turtles were distributed to the longline fishermen.

#### **5.4 Other ecologically related species**

Fishing of marine mammals and whale sharks are banned in Indian waters under various national legislations.

### **6. NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS**

#### **6.1 Log sheet data collection and verification**

In the coastal fishery around mainland India, the Central Marine Fisheries Research Institute (CMFRI), under the Indian Council of Agricultural Research (ICAR), collects data on fish landings through a stratified multi-stage random sampling procedure (CMFRI,2012). For the Island groups of Lakshadweep and Andaman & Nicobar, the landing data reported by the respective Union Territory Governments were utilised.

From the oceanic fishery, the voyage reports (log books) received by the Fishery Survey of India (FSI) and from the Indian owned tuna fishing vessels operating under the Letter of Permission (LOP) scheme formed the data source. New log sheets as per the requirements under the IOTC resolutions were designed and distributed to the LOP vessel operators. Both electronic and paper based data submission schemes are in place for timely submission of the data.

Export of Tuna and allied fish from the country in quantity and value are based on the exports data is collated by the Marine Products Export Development Authority (MPEDA), under the Ministry of Commerce, based on actual export documents.

#### **6.2 Vessel Monitoring System**

Operation of the Indian industrial tuna fishing vessels is monitored by the ATS (Automatic Tracking System). However, Government of India has finalised a programme for

installation of Vessel Monitoring System onboard all the fishing vessels. The technology uses Indian satellites for tracking the Indian fishing vessels. This programme will satisfy all the requirements under the IOTC Resolutions on installation of VMS.

### **6.3 Observer programme**

A programme for posting of observers onboard tuna fishing vessels is being contemplated by the Government of India. However, in FSI tuna longliners which is more than 5% of vessels i.e. FSI research vessels which are operated in Indian EEZ are posted with Scientists for every month onboard data collection. The Scientist will collect data in the prescribed format designed for observer programme in the coming years.

### **6.4 Port sampling programme**

The Central Marine Fisheries Research Institute (CMFRI) is implementing a port sampling programme, wherein the landings, length structure and biological parameters of important species are collected.

### **6.5 Unloading/Transshipment**

Mid-sea transshipment is allowed in Indian tuna fishery under the strict monitoring by Indian Coast Guard, Marine Products Export Development Authority and Reserve Bank of India.

## **7. NATIONAL RESEARCH PROGRAMS**

India is continuously monitoring the stock status, biological parameters and environmental impacts on the oceanic tunas and allied resources in the seas around India by deploying four tuna longliners, of the Fishery Survey of India (FSI), under the Ministry of Agriculture.

A project on “A value chain on oceanic tuna fisheries in Lakshadweep Sea” with funding support from the National Agricultural Innovative Project (NAIP) is operational since

2008. The major activities under the project are resource assessment, trophic modeling, technology development and demonstration for conversion of existing pole and line boats for longlining, improved handling onboard and at landing centers, production of value added products, development of fisheries management advisories, social impact analysis and transfer of technology. The project is being implemented jointly by the Central Marine Fisheries Research Institute (CMFRI), Fishery Survey of India (FSI), Central Institute of Fisheries Technology (CIFT) and the Department of Fisheries, Union Territory of Lakshadweep and National Institute of Fisheries Post Harvest Technology and Training (NIFPHATT).

A project on “Satellite Telemetric Studies on Migration Pattern of Tunas in the Indian Seas (SATTUNA)”, sponsored by the Indian National Centre for Ocean Information Services (INCOIS), aimed to study the migratory pattern of oceanic tunas in Indian waters by satellite technology was initiated during the 2012. Institutes participating in the programme are Fishery Survey of India (FSI), Indian National Centre for Ocean Information Services (INCOIS), Central Marine Fisheries Research Institute (CMFRI) and Centre for Marine Living Resources and Ecology (CMLRE). During the year 2011-13, FSI has tagged 13 PSAT tags on Yellowfin tuna (4 nos. in Western Arabian Sea and another 9 nos. in Eastern Bay of Bengal) to study the migration patterns of tunas in the Indian seas.

Scientists from India participate in various Working Party meetings of the IOTC. Scientific papers on issues relevant to the Working Parties were presented by the Indian Scientists participating in the above meetings.

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

Several recommendations of the Scientific Committee / IOTC are being implemented. A Working Group has been constituted under the chairmanship of the Joint Secretary (Fy.), Ministry of Agriculture, with members from the Ministry, Indian Council of Agricultural Research (ICAR) and relevant Research and Development institutions viz., FSI, CMFRI and MPEDA, for monitoring the implementation of various IOTC resolutions and recommendations. At the FSI, an IOTC cell has been set up to follow up necessary actions. Some of the specific recommendations implemented are furnishes as Table 5.

- Logbook has been designed, printed and distributed to the tuna longline operators. A web based electronic data submission scheme for oceanic tuna fishery is developed for real time data submission by fishing industry.
- Studies are being undertaken on depredation from four tuna longline survey vessels of the Government of India.
- Studies on bycatch are being undertaken from four tuna longline survey vessels of the Government of India.
- The commercial vessels, through the logbook introduced, are being advised to report on the depredation, occurrence of turtles, by-catches and discards in the longline fishery.
- For conservation / protection of sea turtles, several measures including area closures for fishing, fabrication and popularization of TEDs, conducting awareness campaigns and protection under Wildlife Protection Act have been implemented. Indian longline vessels are advised to carry dehookers and line cutters while on fishing operations and pamphlets on safe release of sea turtles were distributed to the longline fishermen.
- A National Plan of Action for Conservation of Sharks (NPOA-sharks) and also a Regional Plan of Action, jointly by Bangladesh, India, Maldives and Sri Lanka is contemplated. Consultation process is in progress.

Table 5. Progress made to recommendation of Scientific Committee.

<b>Res. No.</b>	<b>Resolution</b>	<b>Scientific requirement</b>	<b>CPC progress</b>
05/05	Concerning the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 1–12	Data on the shark bycatch is being reported to the IOTC regularly. Finning is not usually practiced in Indian tuna fishery. The Fishery Survey of India is conducting research to identify measures to make fishing gears more selective and to identify shark nursery areas etc.
10/02	Mandatory statistical requirements for IOTC members and cooperating non contracting parties	Paragraphs 1–7	India is taking all the efforts to meet the deadline for submission of the mandatory data at a maximum level of precision
10/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraphs 3–7	There were no reported instances of sea bird interaction in any of the Indian tuna fishery. Our fishery is not operating in the area south of 25°S, where the sea bird interaction is commonly reported
11/04	On a regional observer scheme.	Paragraph 9	A national programme for ensuring observer coverage of tuna fishing vessels is being contemplated by the Government of India. FSI Scientists will collect data in the IOTC prescribed format in the coming years
12/03	On the recording of catch and effort by fishing vessels in the IOTC area of competence	Paragraphs 1–9	Indian tuna fishing vessels are mandated to use and submit the log books to Indian Government. India had recently developed a system for online logbook submission for the industrial tuna fishing vessels. The data collected is being submitted to IOTC annually.
12/04	On the conservation of marine turtles	Paragraphs 3, 4, 6–10	Fishing and trade of marine turtles are banned in the country. Incidental catch of marine turtles are releases at sea in live condition
12/09	On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence	Paragraphs 4–8	Indian tuna vessels in the IOTC record are instructed to strictly implement this resolution.

## 9. CONCLUSION

Oceanic tuna fishery in India is complex in nature contributed by small scale traditional coastal fishery to Indian owned industrial vessels. Though landings of tuna and allied resources registered an increase in catch, overall pattern of fishery is not lucrative. The coastal tuna fishery is facing serious issues mainly due to declining catches, however oceanic tuna catches are far below the potential estimated (MOA, 2014). In total India's contribution to total oceanic tuna and associated species catch from the Indian Ocean was 2.01%.

As a major step to ensure sustainability in Indian fishery the Government of India adopted a precautionary approach and has been practicing fishing ban for a period of 47 days coinciding with the monsoon season. This measure will definitely help in reduction of effort towards the tuna fishery. Since tunas are highly migratory, the over exploitation in one region will influence the abundance in other regions. Hence, similar area-time closure for the entire Indian Ocean and a major fleet reduction programme for major tuna fishing nations like Distant Water Fishing nations (DWFN) should be adopted for the sustainability of the Indian Ocean tuna fishery.

India is committed to the conservation and management measures within the framework of the IOTC for sustainability of the tuna fishery without affecting the livelihood of millions of coastal fishermen in the country. Indian priority would be, therefore, to safeguard the livelihood security of small-scale fishers by advocating appropriate action by major DWFNs.



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