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India's National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2012

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FISHERY SURVEY OF INDIA

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INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

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 2012 final data for the 2011 calendar year must be provided to the Secretariat by 30 June 2012)	YES vide our letter to IOTC No. 43-6/2003 F-II. Dated 22/06/2012
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 2012, preliminary data for the 2011 calendar year was provided to the Secretariat by 30 June 2012).	YES vide our letter to IOTC No. 43-6/2003 F-II. Dated 22/06/2012
If no, please indicate the reason(s) and intended actions:	

EXECUTIVE SUMMARY

India's tuna fishing fleet includes coastal multipurpose boats operating a number of traditional gears, small pole and line boats, small longliners and industrial longliners. The total production of tunas and tuna-like fishes, including neritic and oceanic tunas, billfishes and seerfishes during the year 2011 was 15,9924 tonnes, against a total production of 12,7616 tonnes during the year 2010. There was a reduction in production by the oceanic fishery and increase in the tuna landings by coastal sector during the year under report. Survey conducted by the Fishery Survey of India in the EEZ revealed that sharks constitute 19.49% by number and 28.39% by weight to the total catch in the longline fishery. There are no reported instances of sea bird interaction in any of the Indian tuna fishery. Sea turtles, marine mammals and whale sharks are protected in India under various national legislations. 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.

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BACKGROUND/GENERAL INFORMATION ON FISHERY

India's tuna fishery is contributed by

a) Coastal fishery, mainly by artisanal sector/mechanised boats operating a number of traditional gears and

b) Oceanic fishery by artisanal pole and line fishery based at the Lakshadweep group of Islands,

c) Small-scale longliner (mainly shrimp trawlers-converted-tuna-longliners) fishery targeting fresh tuna within the EEZ and

d) Industrial longline fishery by the Indian owned tuna longline vessels (LoP vessels).

The total production of tunas and tuna-like fishes, including neritic and oceanic tunas, billfishes and seerfishes during the year 2011 was 159924 t, against a total production of 127616 t during the year 2010. There was a reduction in the catch by the oceanic fishery and increase in the tuna landings by coastal sector during the year under report.

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.

For reducing the fishing pressure on the coastal resources, the Ministry of Agriculture, Government of India had provided financial assistance during the 10^{th} five year plan (2002–2007) for conversion of existing trawlers (mainly shrimp trawlers) above 20 m OAL for tuna longlining. 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.

The Marine Products Export Development Authority (MPEDA) had 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.

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.

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: 2011

Length range (m)	Indian owned vessels		Converted vessels		Total
	Hook & Line	Longline	MPEDA Scheme	MoA Scheme	
12.0-15.9			147		147
16.0-19.9		2	66		68
20.0-23.9	2	19	11	9	41
24.0-39.9	5		1	1	7
40.0-59.9		14			14
Unspecified		17			17
Total	**7**	**52**	**225**	**10**	**294**

CATCH BY SPECIES, AREA AND GEAR

a) By coastal fishery

India's coastal fishery landed 136,657 t of tunas and allied species during 2011. The production from the Fishing Areas 51 and 57 was 78489 t and 58168 t (Table 2), i.e., 57.44% and 42.56% respectively. About 79% of skipjack and 86% of yellowfin caught by the coastal fishery was from the area 57. The 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 25% and neritic species 75%. Among the oceanic species, yellowfin and skipjack were dominant contributing 9971 t and 8759 t respectively. Among the neritic tunas, kawakawa was dominant (42.64%) followed by longtail tuna (15.24%), bullet tuna (9.2%) frigate tuna (7%) and other species.

In the tuna landings from the coastal fishery, 50% was obtained in gillnet followed by hook and line (18%), trawl net (14.4%), ring seine (7.81%), mini-purse seine (7.21%), and the remaining by other gears. The catch details obtained by different gears are given in Table 3.

Table 2. Nominal catch (t) of tuna and tuna-like fishes from the coastal fishery in India: 2011

Species	FAO Area 51	FAO Area 57	Total
Albacore	50	330	380
Skipjack Tuna	1872	6887	8759
Yellowfin Tuna	1404	8567	9971
Bullet Tuna	6178	928	7106
Dogtooth Tuna	37		37
Frigate Tuna	2736	2673	5409
Kawakawa (Little Tuna)	19691	13247	32938
Longtail Tuna	11777		11777
Striped Bonito	323	16	339
Neritic tunas nei		539	539
Tunas total	**44068**	**33187**	**77255**

Marlin	588	795	1383
Sailfish	3663	3417	7080
Swordfish	1581	4	1585
Billfishes total	**5832**	**4216**	**10048**
Indo-Pacific Seerfish	6004	12291	18295
Narrow-Barred Seerfish	21854	8441	30295
Seerfish nei	708		708
Streaked Seerfish	11		11
Wahoo	12	33	45
Seerfishes total	**28589**	**20765**	**49354**
Grand Total	**78489**	**58168**	**136657**

Source: Central Marine Fisheries Research Institute

Table 3. Gear - wise nominal catch (t) of tuna and tuna-like fishes from the coastal fishery in India: 2011

Species	Trawl/ Hook & Lines	Trawl net	Ring seine	Mini purse seine	Hook & Lines	Gillnet / Hooks & Lines	Gillnet	Bagnet	Other gears	Total
Albacore		76			137	1	166			380
Black Marlin		10			472	607	294			1383
Bullet Tuna		34	8	376	5712	34	942			7106
Dogtooth Tuna					5	32				37
Frigate Tuna		6	1089	1738	565	114	1897			5409
Indo-Pacific Seerfish	3	6626	1264	543	272	22	9472	80	13	18295
Kawakawa	43	3799	7904	4505	4105	617	11903	42	20	32938
Longtail Tuna	11	4909		1569	63	57	9730	76		16415
Narrow-Barred Seerfish	222	271	319		4557	517	19563	180	28	25657
Neritic tunas nei					284		255			539
Sailfish		45	33	104	2549	1317	3028		4	7080
Seer fish				708						708
Skipjack Tuna	11	480	53	49	2161	595	5314		96	8759
Streaked Seerfish		9		2						11
Striped Bonito			3		23	21	287		5	339
Swordfish		578	1	13	45	341	585	22		1585
Wahoo		1				11	33			45
Yellowfin Tuna	26	131		242	3559	991	4573		449	9971
Total	**316**	**16975**	**10674**	**9849**	**24509**	**5277**	**68042**	**400**	**615**	**136657**

Source: Central Marine Fisheries Research Institute

b). By oceanic tuna fishery

The nominal catch of tunas and allied species from the oceanic fishery was 23,267 t (Table 4, Fig. 1 and 2). The catch was dominated by yellowfin, contributing 45.45% to the total. Skipjack contributed

34.65% of the total catch. Contribution of billfishes to the total catch was marginal. Indo-pacific sailfish was the dominant billfish species.

Maximum catch from the oceanic sector was by small longliners, targeting fresh tuna in the EEZ. The fishery is concentrated mainly in the South-east and South-west coasts. Catch from this sector was 11,968 t, dominated by yellowfin (7874 t) followed by sailfish (511 t).

Total landing by pole and line fishery based at Lakshadweep was 9978 t. Catch consisted of Skipjack (80%) and Yellowfin (20%).

The effort by industrial tuna fishery, consisting of 52 longline and 7 Hook & line vessels were concentrated mainly in the Andaman and Nicobar waters. Total catch reported by this fishery was 1312.36 t, consisting of yellowfin (705.6 t), Indo-pacific sailfish (249.3 t), marlins (246.7 t) and swordfish (79.5 t).

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

Species/group	Small longline/other gears	Pole and line	Industrial tuna longline	FSI vessels	Total
Yellowfin tuna	7874.07	1995.534	705.6	1.947	10577.15
Skipjack tuna	81	7982.136		0.018	8063.154
Indo-Pacific sailfish	510.59		249.3	0.397	760.287
Marlins	164.01		246.7	0.387	411.097
Swordfish	313.72		79.5	0.812	394.032
Others	3024.97		31.26	5.327	3061.557
TOTAL	**11968.36**	**9977.67**	**1312.36**	**8.888**	**23267.28**

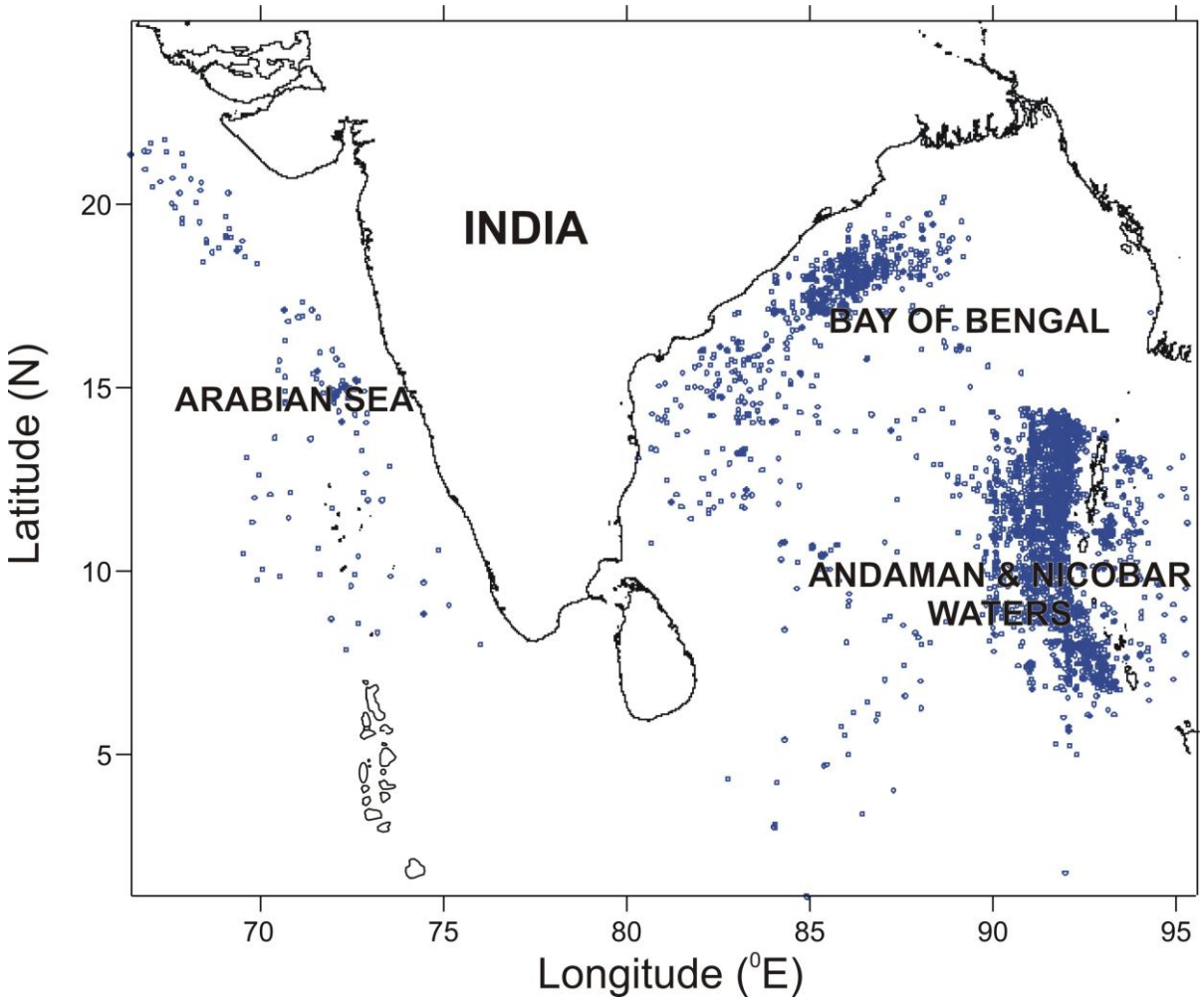

Fig. 1. Map showing distribution of fishing effort (fishing station) by longline fishery

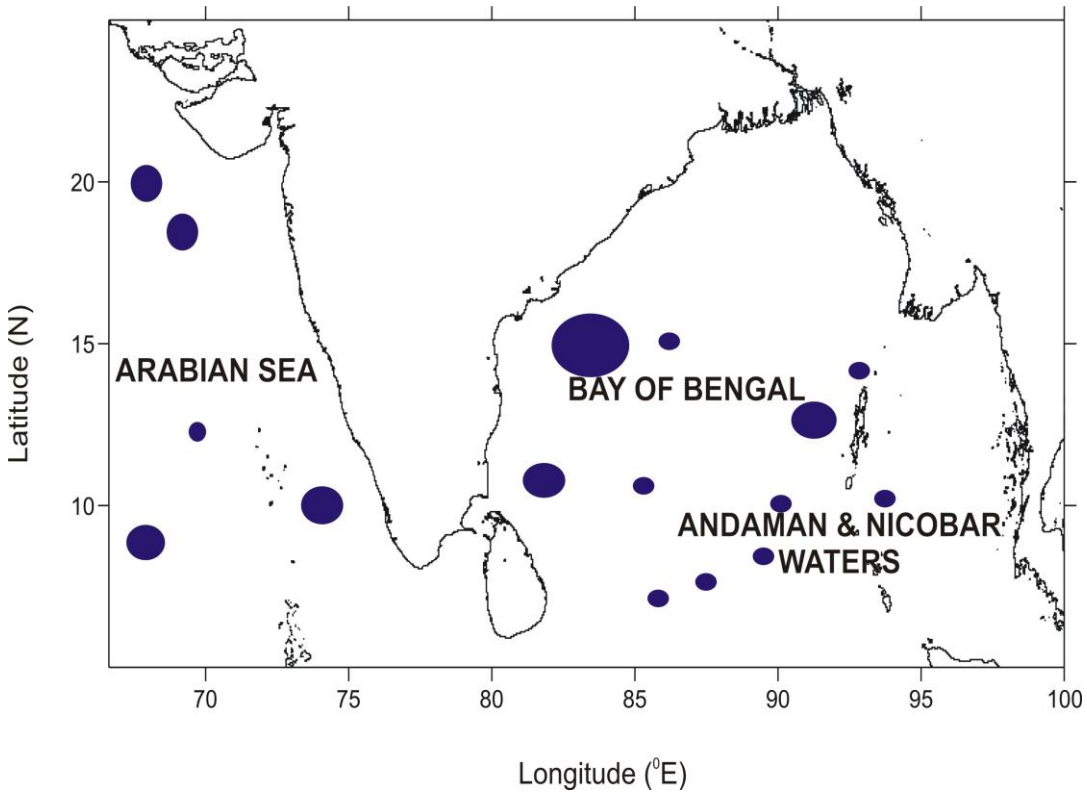

Fig. 2. Map showing yellowfin tuna catch distribution by oceanic tuna fishery

RECREATIONAL FISHERY

In India, large scale recreational fishery for tunas is non-existent.

ECOSYSTEM AND BYCATCH ISSUES

Sharks

Survey conducted by the Fishery Survey of India in the EEZ revealed that sharks constitute 19.49% by number and 28.33% by weight to the total catch in the longline fishery. However, the reported catch of sharks by industrial longline fishery is negligible. 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.

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.

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.

Other ecologically related species

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

NATIONAL DATA COLLECTION AND PROCESSING SYSTEMS

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.

For the island groups of Lakshadweep and Andaman & Nicobar, the landing data reported by the respective Union Territory Governments are considered.

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.

The exports data is collated by the Marine Products Export Development Authority (MPEDA), under the Ministry of Commerce, based on actual export documents.

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.

Observer programme

A programme for posting of observers onboard tuna fishing vessels is being contemplated by the Government of India.

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.

Unloading/Transhipment

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

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 for "Locating tuna habitat through satellite remote sensing", jointly by the Fishery Survey of India and the Space Applications Centre (SAC) of the Indian Space Research Organization (ISRO), is in the last phase.
- A project on "Strategies for sustaining tuna fisheries along the coast of India" is being undertaken by the CMFRI, with the objective of studying the impact of exploitation on the neritic tuna stocks and to suggest strategies for sustainable development. The project period is 2008–2012 and it is being implemented from four centers viz., Veraval (Northwest coast), Kochi (Southwest coast), Tuticorin (southeast coast) and Visakhapatnam (Northeast coast).
- 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 last year. 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).
- 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.

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 given below:

- 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.

The following table furnishes the progress made to specific recommendations of the SC and specific Resolutions relevant to the work of the Scientific Committee.

Res. No.	Resolution	Scientific requirement	CPC progress
05/05	Concerning the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 1–12	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 (Varghese *et al.,* 2007) 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.
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 maintain log books. Recently, new logbooks are issued to the industrial tuna fishing vessels.
12/04	On the conservation of marine turtles	Paragraphs 3, 4, 6–10	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. The FSI has undertaken studies on the sea turtle bycatch in tuna longline fishery.
12/09	On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of competence	Paragraphs 4–8	India has initiated action on this Resolution. However, we need to conduct stakeholder meetings, negotiations at national level Ministries etc. for enforcing blanket ban on the catch of thresher sharks. The FSI is undertaking research on the various aspects of shark interactions in longline fishery.

CONCLUSION

Oceanic tuna fishery in India is facing serious issues mainly due to declining catches. Since tunas are highly migratory, the over exploitation in one region will influence the abundance in other regions. India's contribution to total oceanic tuna and associated species catch from the Indian Ocean during 2006 was 2.01%. Our oceanic tuna catches are far below the potential estimated (Anon, 2011). India adopts a precautionary approach and has been practicing fishing ban for a period of 65 days coinciding the monsoon season. Similar area-time closure for the entire Indian Ocean and a major fleet reduction programme for major tuna fishing nations (DWFNs, mainly) 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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