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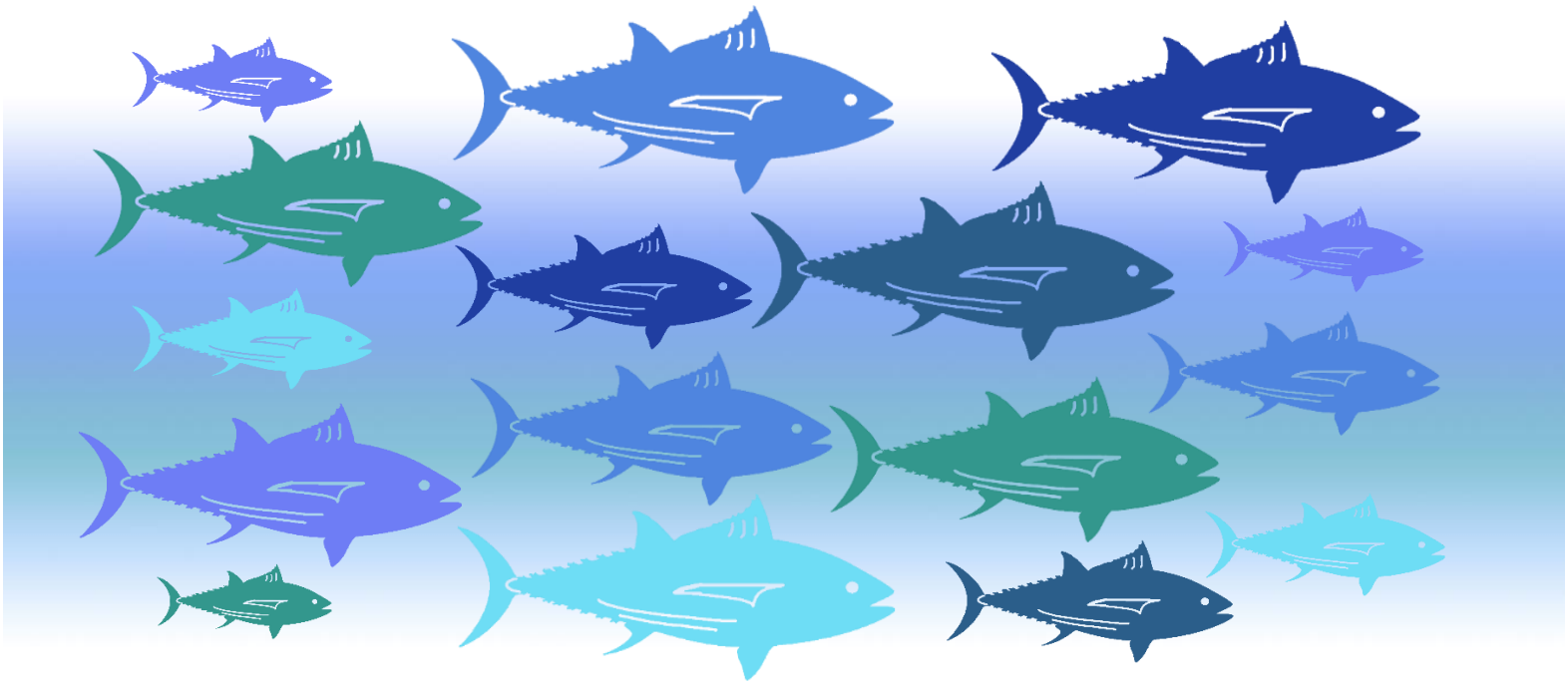
India's National Report to the Scientific Committee of the Indian Ocean Tuna Commission 2025



India's National Report to the Scientific Committee of the Indian Ocean Tuna Commission 2025

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INFORMATION ON FISHERIES, RESEARCH AND STATISTICS

In accordance with IOTC Resolution 15/02 (and other data related CMMs as noted below), final scientific data for the previous year were provided to the IOTC Secretariat by 30 June of the current year, **for all fleets other than longline** [e.g., for a National Report submitted to the IOTC Secretariat in 2025, final data for the 2024 calendar year must be provided to the Secretariat by 30 June 2025)	YES 30/06/2025
In accordance with IOTC Resolution 15/02, provisional **longline data** for the previous year was provided to the IOTC Secretariat by 30 June of the current year [e.g., for a National Report submitted to the IOTC Secretariat in 2025, preliminary data for the 2024 calendar year were provided to the IOTC Secretariat by 30 June 2025). **REMINDER:** Final longline data for the previous year are due to the IOTC Secretariat by 30 Dec of the current year [e.g., for a National Report submitted to the IOTC Secretariat in 2025, final data for the 2024 calendar year must be provided to the Secretariat by 30 December 2025).	YES 30/06/2025
If no, please indicate the reason(s) and intended actions:	

Executive Summary

In 2024, total landings of tuna and tuna-like species along the Indian coast were estimated at 2,21,665 tonnes, an 8% increase over the 2,05,189 tonnes recorded in 2023. Gillnets continued to be the primary gear used, accounting for 29.78% of the catch. Longlines (21.94%) and small purse seines (19.21%) followed, with gillnet-cum-longline combinations and trawl nets also making significant contributions. Pole-and-line fishing, practised exclusively in the Lakshadweep archipelago added 3.71% to the total, while other gears such as troll lines and handlines contributed smaller quantities.

The fishery showed clear regional variation. The west coast of India (FAO Area 51) produced the majority of the catch (60.33%), while the east coast (FAO Area 57) accounted for the remaining 39.67%. Landings in 2024 included eight tuna species, with five neritic species making up 56.39% of the total and three oceanic species contributing 43.61%. The most abundant species in Indian tuna fishery were kawakawa (*Euthynnus affinis*, 29.98%) and skipjack tuna (*Katsuwonus pelamis*, 22.29%), followed by yellowfin tuna (*Thunnus albacares*, 20.99%).

Importantly, there were no reported interactions between the Indian tuna fishery and seabirds during the year, nor were there any recorded mortalities of sea turtles, marine mammals, or whale sharks - species protected under Schedule I of India's Wildlife (Protection) Act, 1972.

Data for these assessments are collected and compiled through a collaborative effort by the Fishery Survey of India (FSI) under the Department of Fisheries of the Government of India, ICAR–Central Marine Fisheries Research Institute (ICAR–CMFRI), and the fisheries departments of coastal States and Union Territories.

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1.0 Background/General Fishery Information

India have a long coastline of 11,098 km with a continental shelf area of 0.53 million square km and have exclusive rights over the marine living and non-living resources of 2.02 million square kilometres Exclusive Economic Zone (EEZ). Owing to this vast area of marine waters under her jurisdiction, marine fisheries had always playing an important role in the food and nutritional security, livelihoods and economic prosperity of the nation. Further, marine fisheries are a major source of employment and livelihoods for one million coastal fishermen and households, who also generate further multiplier employment in the ancillary activities like fish processing and marketing. Government of India had been keen on the sustainable harvest for perpetuity of fisheries resources.

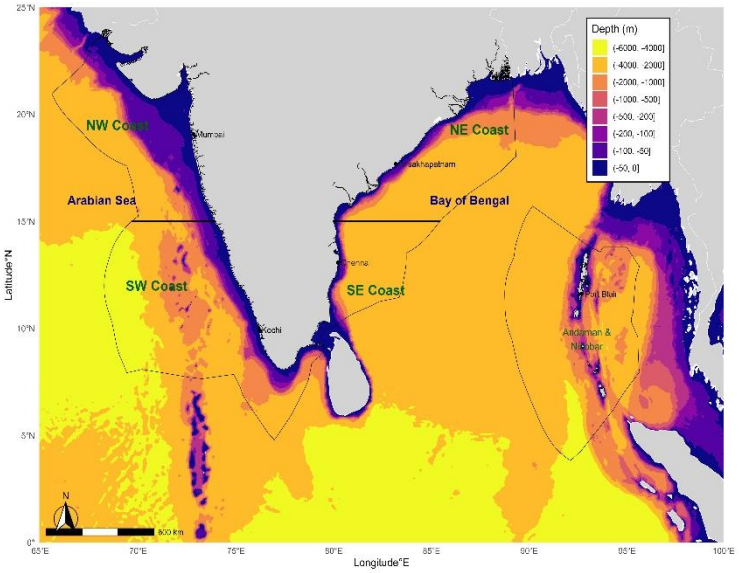

Figure 1: Exclusive Economic Zone of India

Fisheries contribute 1.1% to India's economy (GoI, 2022). During 2021-22, the total marine fish production was 4.13 million tonnes (GoI, 2022), and the estimated value of marine fish landings during 2018 was estimated at INR 526.36 billion (approx. USD 7.35 billion) at point of first sale and INR 803.20 billion (approx. USD 11.20 billion) at retail market. India has also become a major global player in the seafood trade, with total seafood exports amounting to over 1.37 million M T, valued at over US$ 7,759.58 million during 2021-22.

India's Exclusive Economic Zone (EEZ) covering 2.02 million sq.km contains diverse and multi-species fish stocks, exploited by multi-gear fisheries, which are mostly concentrated in the coastal areas (<100m depth). Major fisheries exploit small pelagics (*e.g.* sardines, mackerels), demersals (*e.g.* ribbonfishes) and crustaceans (*e.g.* shrimps). The fishing fleet structure is mainly comprised of mechanized (64,254 nos.), motorized (1,33,573 nos.) and non-motorized (40,615 nos.), operating from 1,537 landing centres in the 9 coastal States, 2 Union Territories (UTs) and the 2 Island groups.

In India, the small-scale and artisanal sectors largely contribute to the tuna fishery, deploying both mechanized[1] and motorized[2] boats, using a variety of gear. The Lakshadweep group of Islands located in the Arabian Sea (FAO Area 51) use artisanal pole and line targeting the surface swimming oceanic species, primarily the skipjack tunas. In the past one decade, efforts

[1]***In India, the mechanized fleet pertains to fishing vessels fitted with inboard engines that are used for both propulsion and hauling the gear. The mechanized boats have a wheel house and the entire fleet is below 24-meter length overall (LoA).***

[2]***The Indian motorized fleet comprises undecked boats using outboard motors for propulsion only. The entire fleet is below 24 meterLoA.***

were made to convert the small-scale trawlers into longliners to promote resource specific fishing within the country's EEZ.

2.0 Fleet Structure

The Indian fishing fleet comprises of an assemblage of fishing boats that mainly include trawlers, gillnetters, small purse/ring seiners, hooks and line boats, etc. Other than pole and line boats and to some extent hooks and lines boats, all other gears catch a variety of species including tunas. Indian marine fishery is exclusively small scale in nature and the Government of India does not permit Indian commercial vessels to fish outside the Indian EEZ as per the prevailing management measures. Table 1 below provides the data on the fishing fleet structure.

Table 1: Fishing fleet structure of India

Craft/Gear	Mechanised	Motorised	Non-motorized	Total
Trawlers	32835	411	37	33283
Gillnetters	18427	89191	25040	132658
Dol/Bagnetters	5568	1307	814	7689
Longliners	524	969	83	1576
Hooks & liners	391	4982	2349	7722
Ring seiners	12	20	11	43
Small Purse seiners	1044	1	10	1055
Pole & liners	10	686	16	712
Others	5443	36006	12255	53704
Total	64254	133573	40615	238442

3.0 Catch and effort by species and gear

The Indian fishery of tuna and tuna-like species (hereinafter referred to as tuna fishery) comprises a complement of 13 types of gear and gear combinations (plus some minor gears operated locally) harvesting a total of 15 tuna and tuna like species in 2024. **Table 2** provides the composition of species/groups harvested by different gear type.

The total landings of tuna and tuna-like species along the Indian coast for 2024 are estimated at 2,21,665 tonnes, an 8% increase over the 2,05,189 tonnes recorded in 2023. Gillnets continued to be the primary gear used, accounting for 29.78% of the catch. Longlines (21.94%) and small purse seines (19.21%) followed, with gillnet-cum-longline combinations and trawl nets also making significant contributions. Pole-and-line fishing, practised exclusively in the Lakshadweep archipelago added 3.71% to the total, while other gears such as troll lines and handlines contributed smaller quantities (**Fig. 2 & Table 2,3**).

The fishery showed clear regional variation. The west coast of India (FAO Area 51) produced the majority of the catch (60.33%), while the east coast (FAO Area 57) accounted for the remaining 39.67%. Landings in 2024 included eight tuna species, with five neritic species making up 56.39% of the total and three oceanic species contributing 43.61%. The most abundant species in Indian tuna fishery were kawakawa (*Euthynnus affinis*, 18.78%) and skipjack tuna (*Katsuwonus pelamis*, 13.96%), followed by yellowfin tuna (*Thunnus albacares*, 13.15%).

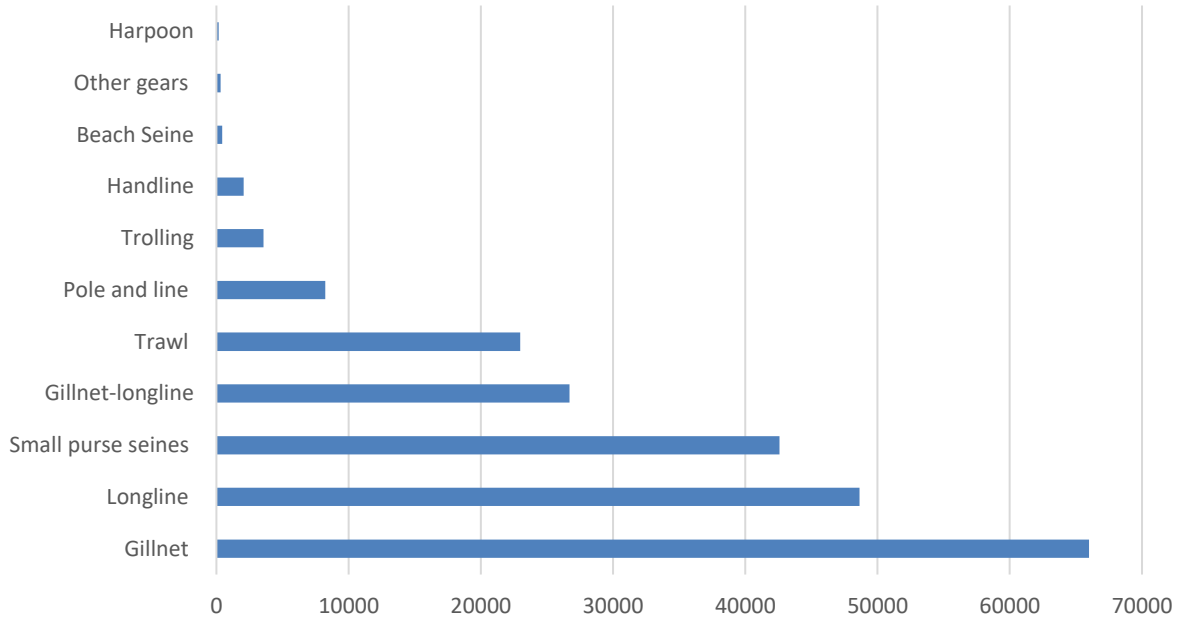

Figure 2: Gear-wise catch composition (quantity in t) in tuna fishery in 2022

The oceanic tunas comprising three species {Yellowfin (YFT), Skipjack (SKJ) and Bigeye (BET) tunas} contributed to 27.31% of the total tuna and tuna like species landings during 2024. The neritic tunas comprising five species contributed to 35.32% of the total tuna and tuna like species landings during the same period.

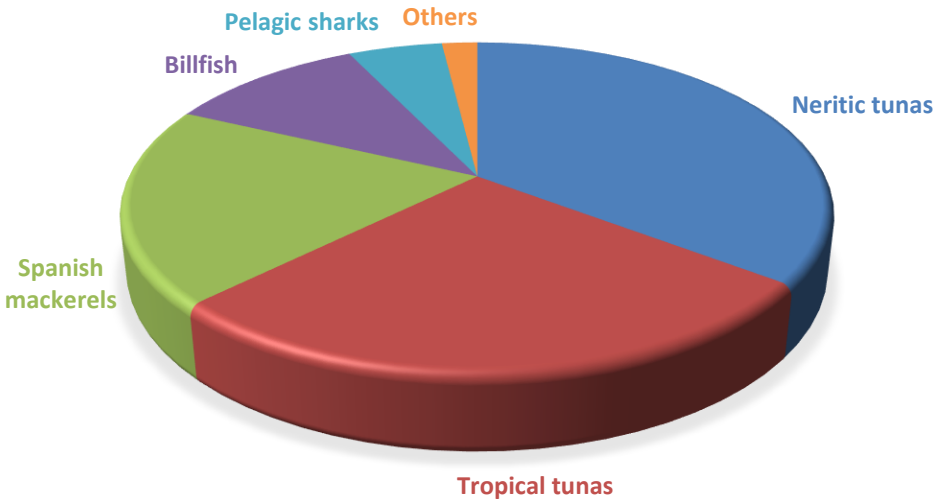

Figure 3: Group-wise catch composition of tunas and tuna-like fishes, 2024

The Spanish mackerels also contributed significantly (19.37%) to the total tuna and tuna-like species landings of India during the year 2024. The billfishes, including Indo-Pacific sailfish, marlins and swordfish collectively formed 10.89%, whereas pelagic sharks (5.17%) and the other species (1.94%) constituted the rest of the landings (**Fig. 3**).

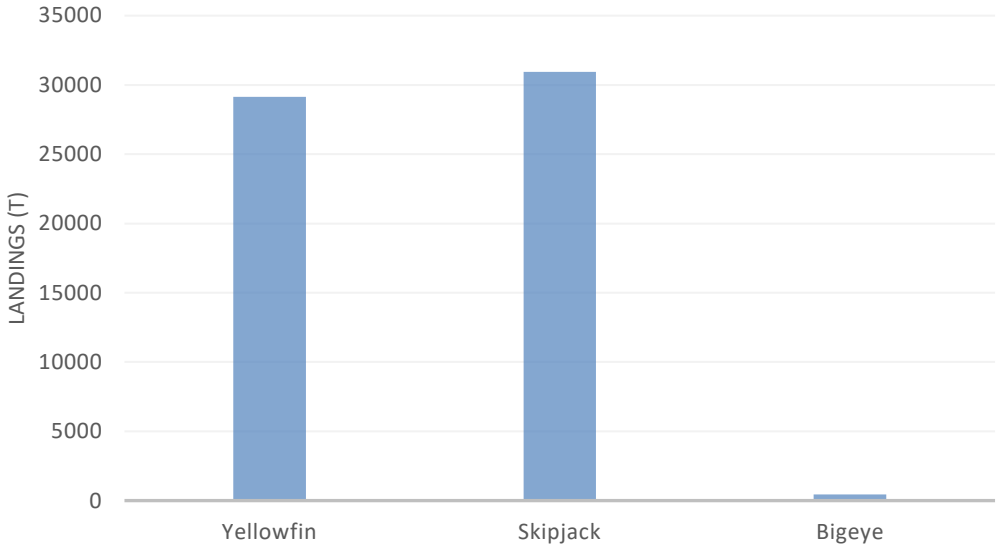

Fig. 4: Nominal catch of tropical tunas (yellowfin, skipjack and bigeye tunas), 2024

The nominal catch of tropical tunas (yellowfin, skipjack and bigeye tunas), in 2024 was 60530 t, comprising 29141t of yellowfin tuna, 30943 t of skipjack tuna and 446 t of bigeye tuna (**Fig.4**). Area-wise landings indicate that 60.33 %of the total landings were from the west coast of India including the Lakshadweep Islands (FAO Area 51), whereas the remaining 39.67 % was from the east coast, including the Andaman and Nicobar Islands (FAO Area 57) (**Figs.5a, 5b**).

The landings on the east coast of India comprised 54.14% of yellowfin, 49.80% of skipjack and 3.59% of bigeye tuna, whereas the west coast landings constituted the remaining 45.86% of yellowfin, 50.20% of skipjack and 96.41% of bigeye during 2024.

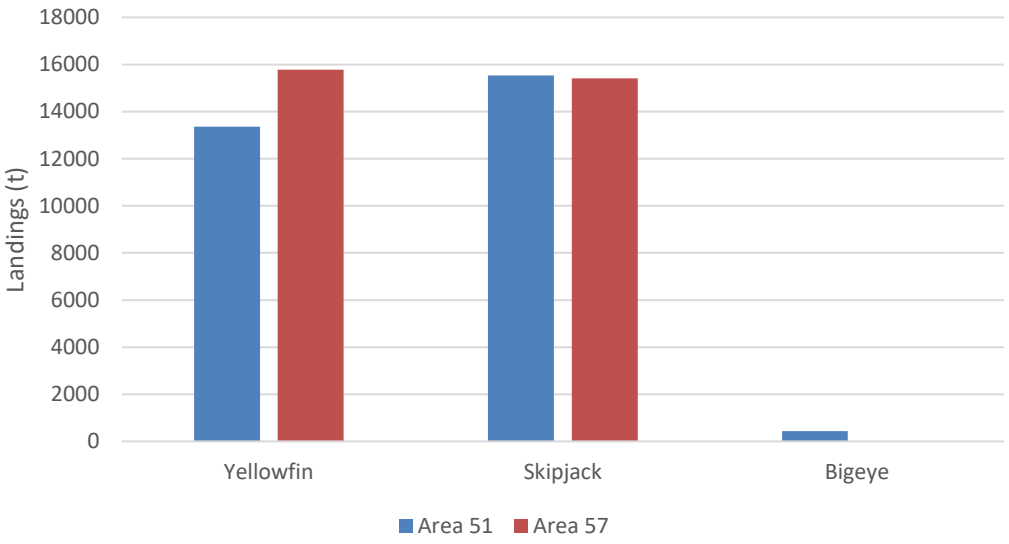

Figure 5a. Pattern of tropical tuna catch in west and east coasts of India (2024)

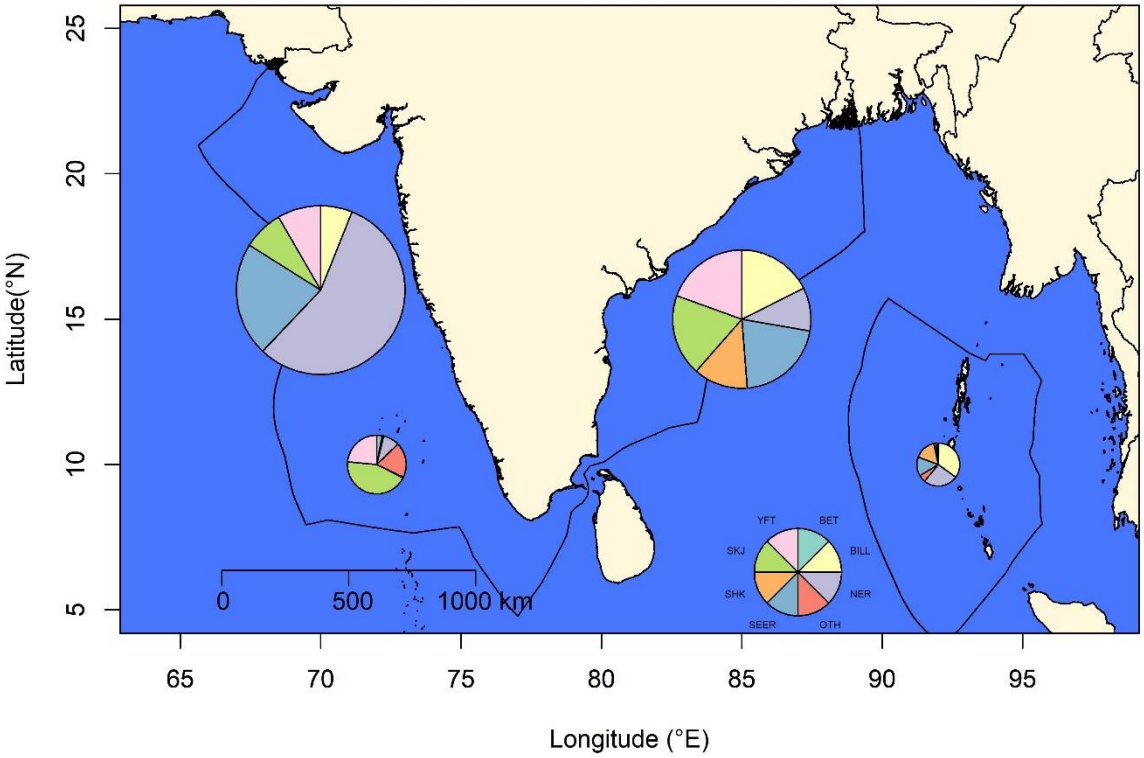

Figure 5b: Map showing group-wise catch composition of tunas and tuna-like fishes (2024)

More than ten types fishing gears were employed for catching the tropical tuna species. Drift gillnets remained the major gear contributing to the tuna and tuna like fish catch was (29.78%) during 2024. Longline, small purse seine and trawl nets (21.94, 19.21% and 10.36% respectively), followed by pole and line, trolling and handline were the principal gears contributing the catch. Other gears like beach seine, harpoon and other gears also contributed to the tuna landings in small quantities during the year.

Drift gillnet remained the principal gear for exploitation of tropical tunas in India. This gear contributed 28.63% of the total landings of tropical tunas that comprised 20.61% of yellowfin,

36.47% of skipjack, and 10.31% of bigeye tuna. Small scale longliners caught 24.98% of the all three tropical tunas, 41.69% of yellowfin, 9.55% of skipjack and 3.59% of the bigeye during the year under report. The pole and line fishery practiced in the Lakshadweep Islands (South-eastern Arabian Sea) contributed 11.83% (total catch of tropical tunas), 4.65% YFT, 18.21% SKJ and 38.57% BET.

Tuna fishing using troll line and bringing them ashore preserved in ice contributed 3.32% to the total tropical tuna catch, which included 4.06% YFT, and 2.37% SKJ and 21.08% of the BET. Boats using gillnet-cum-longline gear contributed to 24.11% of the total tropical tuna catch, catching 16.71%of total YFT caught, and 31.43% SKJ. Contributions by the other gears, including small purse seines to the tropical tuna catch of India during 2024 was marginal (**Fig.6**). Exploratory longline survey by the vessels of the Fishery Survey of India (FSI) could not be undertaken during 2024, since these vessels were undergoing periodic drydocking repairs during this year.

Considerable spatial variation was observed in the landings of the tuna and tuna-like species during 2024 in India. The west coast of India (FAO area 51) contributed the larger share (60.33%) and the balance 39.67% landings came from the east coast (FAO area 57). West coast, where fishing fleet is more mechanized, dominates the landings (**Fig. 7**). Neritic tunas were the dominant group in the landings of the west coast. More than 99 % of the longtail tuna (*Thunnus tonggol*), 77.96% of *Auxis thazard*, 87.37% of *Euthynnus affinis* and 92.13% of *Auxis rochei* catch was from the west coast. However, tropical tunas were increasingly caught from the east coast (51.55%). 54.14% of yellowfin, 49.80% of skipjack and 3.59% of bigeye were caught from the east coast.

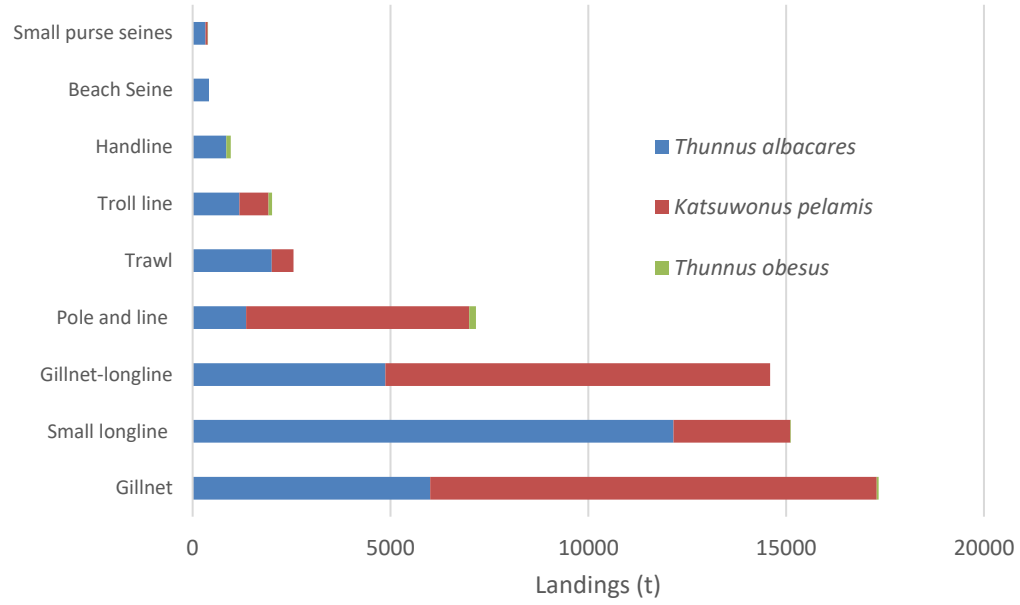

Figure 6: Tropical tuna catch (2024) by different gears

Analysis of trends in the catch during 2018-2024 revealed remarkable reduction in the catch of tropical tunas over the years (**Table 3, Figure 8**). The catch of yellowfin tuna by the Indian fishery in 2018 was 37,488t, which shrank to 29,141t during 2024. There were remarkable reductions in the catch of other species, including skipjack, sailfish, swordfish, spanish

mackerels, etc. during 2024 in comparison with 2018. However, there was a marginal increase in the catch, especially of tropical tunas and neritic tunas during 2024 in comparison with 2023.

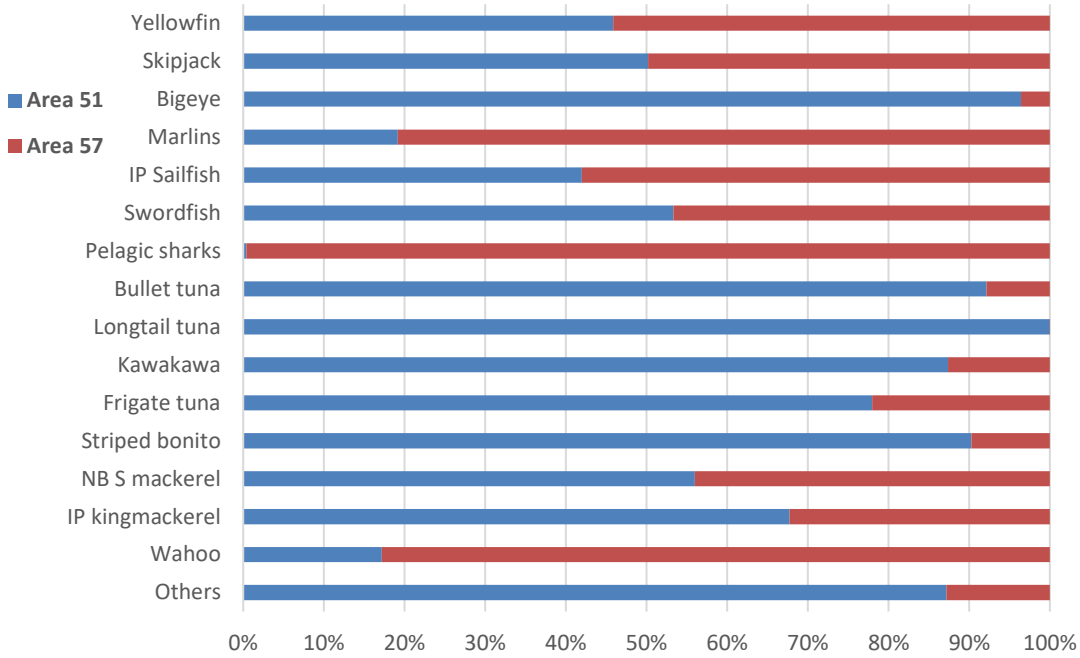

Figure7: Area-wise composition of major groups/species

Table 3. Annual trends in the nominal catch (tonnes) of Tuna and allied resources (2018-2024)

Species/group	2018	2019	2020	2021	2022	2023	2024
T. albacares	37488	33554	20795	24515	20851	21247	29141
K. pelamis	36388	25383	19385	25861	27639	31711	30943
T. obesus	610	1026	1031	760	319	569	446
Marlins	5455	6027	4952	3658	4029	8247	13075
I. platypterus	10026	8700	3438	8021	5417	6150	9401
X. gladius	2877	2310	514	1535	2227	2337	1672
Pelagic sharks	959	15248	9927	7965	12242	16580	11468
S. commerson	29960	30780	24462	35473	27334	22428	27179
S. guttatus	15101	16279	13776	2182	15314	13580	15748
Spanish mackerels (NEI)					1518	1622	
A. thazard	8806	8669	8487	6146	16299	9662	17715
E. affinis	33208	33863	30134	28629	45945	50544	41622
T. tonggol	7678	5852	4050	1707	2755	4348	6536
A. rochei	8297	7242	6930	4715	6079	12495	11535
NEI	12075	4947	4800	8576	5020	3669	5184
Total	208928	199880	152681	159743	192988	205189	221665

NEI – not elsewhere included

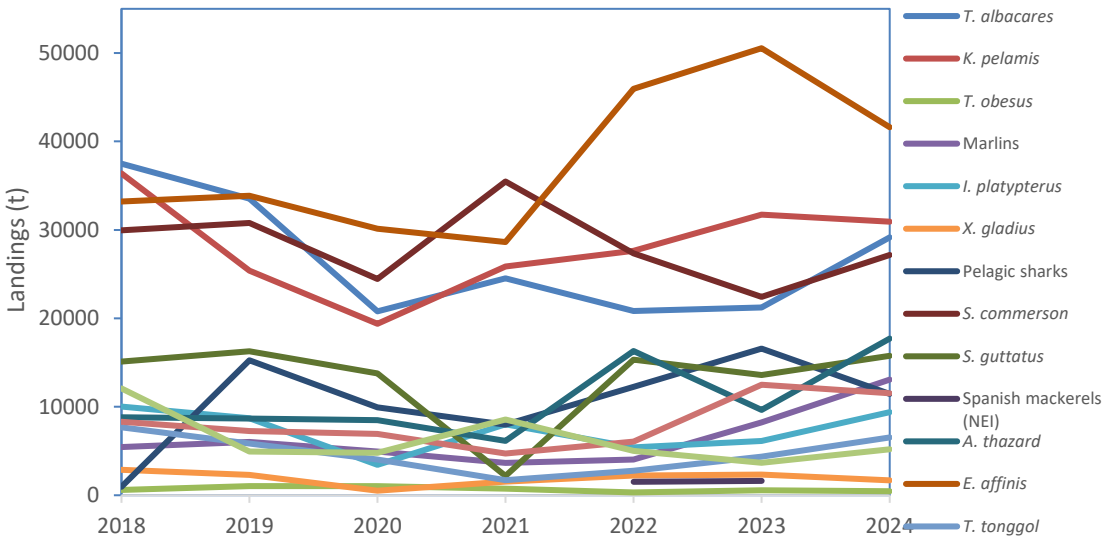

Figure8: Historical annual landings in the Indian tuna and tuna like fishery

3.1 Longline tuna fishery in India

In India, the dedicated longline fishery is practiced by the four fishing vessels of the Fishery Survey of India. The key attributes of these four vessels are as follows:

Table 4: Indian longline vessels in the IOTC RAV

Name	*MatsyaVrushti*	Yellow Fin	*MatsyaDrushti*	Blue Marlin
LoA (Meter)	37.5	36	37.5	36
GRT (Tonnage)	465	290	465	290
BHP	1100	800	1100	800
Base of operation	Mumbai	Mormugao	Chennai	Port Blair
IOTC Registration Number	IOTC 003604	IOTC 003602	IOTC 003605	IOTC 003603

The above-referred four longliners undertake exploratory surveys in the Indian EEZ for tuna and tuna-like species. Since these vessels were undergoing mandatory drydock repairs, the survey operations could not be undertaken during the reporting year.

4.0 Recreational Fishery

Presently, recreational fishery for tunas is limited to few licenses issued in the Andaman and Nicobar Islands vide Notification No. 222/2017/F. No. 3-85/2015-16/TS/DF/PF-II) dated 20thSeptember 2017 under the Marine Fishing Regulation Act 2003 of the UT Administration[3].

The National Policy on Marine Fisheries, 2017[4] in its guidance on the promotion of additional/alternative sources of livelihoods, has focused on eco-tourism and in particular game fishing and the concept of Catch, Photograph and Release (CPR) while undertaking such fishing. Further, the government also proposes to promote CPR schemes among fishermen in suitable areas and will also consider harmonizing tourism plans related to coastal and marine waters with the livelihood needs of the fishers.

5.0 Ecosystem and by-catch issues

5.1 Sharks

The landings of pelagic sharks in India by tuna fishery during 2022 were estimated at 11,468 tonnes. The mechanized sector contributed to more than 80 % of the total landings. Gillnets, longlines, and trawls, were the major gears contributing to pelagic shark landings. Targeted shark fishery along the north Kerala coast has almost stopped, following the relocation of fishermen from Tamil Nadu who were engaged in this fishing (Annual Report CMFRI, 2018).

5.1.1. NPOA sharks

The National Plan of Action for Conservation and Management of Sharks (NPOA-Sharks[5]) prepared by the Bay of Bengal Programme Inter-Governmental Organisation in collaboration with the Bay of Bengal Large Marine Ecosystem Project (Phase 1) is being formalised.

5.1.2. Sharks finning regulation

In India, the following species of marine sharks and rays are listed under Schedule I and II of the Indian Wildlife (Protection) Act, 1972. These species should not be caught, harvested, or traded. Further, killing or unauthorized possession of the prohibited species is a non-bailable offence, attracting imprisonment for a period ranging from three to five years, and a penalty of Rs 25,000 (about US $ 305). However, as no fishing device is available to exclude these species selectively from the catch, especially from gillnet and hooks & lines, they are incidentally caught in those fishing gear.

Common name	Scientific name
SCHEDULE I	
Sharks	
Gangetic shark	*Glyphis gangetics*
Pondicherry shark	*Carcharhinus hemiodon*
Whale shark	*Rhincodon typus*
Rays, Wedgefishes	
Ganges stingray	*Himantura fluviatilis*

[3] http://andssw1.and.nic.in:8081/sfpermit/pdf/gazette_notification.pdf

[4] http://dahd.nic.in/news/notification-national-policy-marine-fisheries-2017

[5] https://www.boblme.org/documentRepository/BOBLME-2015-Ecology-65.pdf

Common name	Scientific name
Giant freshwater whipray	*Urogymnus polylepis*
Porcupine whipray	*Urogymnus asperrimus*
Smoothnose wedgefish	*Rhynchobatus laevis*
Bottlenose wedgefish	*Rhynchobatus australiae*
Guitarfishes	
Giant guitarfish	*Rhynchobatus djiddensis*
Bowmouth guitarfish	*Rhina ancylostomus*
Clubnose guitarfish	*Glaucostegus thouin*
Widenose guitarfish	*Glaucostegus obtusus*
Mantas	
Giant manta	*Mobula birostris*
Reef manta	*Mobula alfredi*
Sawfishes	
Common sawfish	*Pristis pristis*
Dwarf sawfish	*Pristis clavata*
Green sawfish	*Pristis zijsron*
Narrow sawfish	*Anoxypristis cuspidata*
SCHEDULE II	
Sharks	
Great hammerhead	*Sphyrna mokarran*
Oceanic whitetip	*Carcharhinus longimanus*
Smooth hammerhead	*Sphyrna zygaena*
Winged hammerhead	*Eusphyra blochii*
Rays	
Sicklefin devil ray	*Mobula tarapacana*
Mottled eagle ray	*Aetomylaeus maculatus*
Ocellate eagle ray	*Aetomylaeus milvus*
Ornate eagle ray	*Aetomylaeus vespertilio*

Further, intending to stop the hunting of sharks and to enable the enforcement agencies to monitor the illegal hunting/poaching of the species of Elasmobranchs listed in Schedule I of the Wild Life (Protection) Act, 1972, the then Ministry of Environment and Forest vide its Policy Circular No. F. No. 4-36/2013 WL dated 25th of August 2013 has prohibited the removal of shark fins on board the vessels in the sea. The policy also prohibits any possession of shark fins that are not naturally attached to the body of the shark. In addition, the Ministry of Commerce, Government of India has also notified vide its Order No. 110 (RE. -2013)/2009-2014 dated 6

February 2015 prohibiting the export of shark fins of all species of sharks. The burden of proof will lie on the accused and failing to do so by the accused will attract a penalty as per the Act.

5.1.3. Blue shark

Blue sharks are sporadically reported in the shark bycatch in the Indian tuna fishery. However, India has a well-established fishery data collection system, regularly collecting data on fish catch, including blue sharks and the catches are being monitored domestically. Data on the blue shark catch is recorded and furnished to the IOTC as and when reported. Scientific research on blue sharks is being undertaken and results have been published (e.g., Varghese *et al*., 2017)

5.2 Sea birds

There were no reported instances of seabird interactions 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 reported to be more.

5.3 Marine turtles

All five species of marine turtles occurring in Indian waters are listed in Schedule I of the Indian Wildlife (Protection) Act, 1972, hence protected from capture. Ministry of Environment, Forest and Climate Change, Government of India has released a National Marine Turtle Action Plan with the aim to conserve marine turtles and their habitats in India. Further, the bycatch of sea turtles in the Indian longline fishery was remarkably lower than those reported elsewhere (Varghese *et al*., 2010). However, during the reporting period, no interaction has been observed in the longline catches.

5.4 Marine mammals

Like marine turtles, all the marine mammal species occurring in the Indian waters are protected under the Wildlife (Protection) Act, of 1972. The Government of India through its R&D agencies also undertake several programmes for conservation of the marine mammal habitats. One such programme pertains to the 'marine mammal stranding interactive map', which provides scientific information on the attributes of the species, its habitat and standard operating procedure in case of stranding (CMFRI, 2018). Further, the Fishery Survey of India, in collaboration with ICAR-CMFRI, ICAR-CIFT and MPEDA is undertaking a programme on "Marine Mammals Stock Assessment in India (MMSAI). Currently, the Government of India has prioritized some of the rare and threatened marine mammals, especially humpback whales and Dugongs for assessing country-wide population status and monitoring under the scheme of Integrated Development of Wildlife Habitat (IDWH). Under the Endangered Species Recovery Program (ESRP), the marine mammal Dugong has received special attention with a country-wide effort towards the conservation of Dugongs and their habitat conservation and about 450 sq km area in Palk Bay has been declared as a Dugong Conservation Reserve for conservation of Dugongs and seagrass associated marine species.

6.0 National Data collection and processing systems

The ICAR-CMFRI collects the landing data in the mainland following a stratified multi-stage random sampling method. The Fishery Survey of India undertakes exploratory surveys and the data from such surveys is also added to the national data processing system. Besides this, the FSI also compiles the landing data received from the two Island Territories – the Lakshadweep and the Andaman & Nicobar Group of Islands.

6.1 Log Sheet data collection and verification

The authorized tuna fishing vessels in India are reporting their catch on log sheets as per the IOTC Resolutions.

6.2 Vessel Monitoring System

While several coastal states in India have installed Vessel Tracking System (VTS) and Automatic Identification System (AIS), and transponders (a satellite based two way communication system) a full-fledged Vessel Monitoring System (VMS) is being implemented after receiving necessary

regulatory approvals from other concerned Ministries/Departments within the Government system.

6.3 Observer programme
In India, observers are placed on-board on all the authorized tuna longlining vessels.

6.4 Port sampling programme
The ICAR-CMFRI and the Department of Fisheries of the coastal State/UTs undertake sampling programmes at the designated centres, following a standard methodology. Besides estimating the landings, important biological and socio-economic information is also collected regularly.

6.5 Unloading / Transshipment
Both unloadings by foreign fishing vessels and mid-sea transhipment are not permitted under the prevailing rules/regulations.

6.6. Actions taken to monitor catches & manage fisheries for Striped Marlin, Black Marlin, Blue Marlin and Indo-pacific Sailfish
The landings of Striped Marlin, Black Marlin, Blue Marlin and Indo-Pacific Sailfish are monitored through the sampling programme listed in 6.4.

6.7. Gillnet observer coverage and monitoring
India does not have a large-scale gillnet fishery registered in the IOTC RAV.

6.8 Sampling plans for Mobulid rays
India has a national sampling programme, for all the fish caught, including Mobulid rays caught by the artisanal fishery. The fishery and biology data are being collected at national as well as State (Province) levels.

6.9 Electronic Monitoring Standards
India has not implemented Electronic Monitoring system for tuna fishing vessels.

7.0 National Research Programmes

India has a long-standing research programme on land-based sampling and sea-based exploratory surveys of tuna fishery. The ICAR-CMFRI along with the coastal States/UTs undertakes regular sampling and estimation of the tuna fishery resources from designated landing points along the Indian coastline. Besides estimating the tuna fishery landings, studies on the biological and socio-economic attributes of tuna fisheries are also carried out by the Institute regularly. The survey of oceanic resources is undertaken by FSI through its four dedicated longliners, two based on the East Coast and two on the West Coast. These modern longliners undertake exploratory surveys regularly through pre-determined sampling programmes. The exploratory surveys provide information on the distribution of tuna resources in the Indian EEZ, effort, by-catch and also various environmental parameters to correlate with the exploitation of tuna fishery resources. The FSI has embarked on a large programme to undertake the marine mammal stock assessment in India, wherein the status of marine mammals in the Indian seas within the EEZ will be monitored, the marine mammal interaction and mortality in fishing will be studied in detail and the mitigation measures will be identified. The Central Marine Fisheries Research Institute (ICAR-CMFRI), ICAR-Central Institute of Fisheries Technology (ICAR-CIFT) and Marine Products Export Development Authority (MPEDA) are the collaborating Institutes. A research project entitled "Stock Structure of Yellowfin tuna in the Indian EEZ" is being implemented to delineate the stock structure of Yellowfin tuna in the Indian EEZ and adjoining high seas. The FSI and ICAR-CMFRI are the participating Institutes.

The above listed National research programs include detailed research on the fishery, distribution, abundance, nursery grounds and biology of billfish (Striped Marlin, Black Marlin, Blue Marlin and Indo-pacific Sailfish), pelagic and demersal sharks (especially silky, oceanic whitetip and thresher sharks). Bycatch, if any, and other interactions of seaturtles to the fishery also is studied.

Besides the above four dedicated institutions, various other agencies, both governmental and non-governmental also undertake R&D activities on tuna fishery. The Centre for Marine Living Resources and Ecology (CMLRE) under the Ministry of Earth Sciences (MoES) also undertakes exploratory surveys of the fishery resources in the Indian EEZ. These surveys often include programmes on tuna fishery. In addition, the Department of Science & Technology (DST) of the Ministry of Science & Technology (MS&T), the Indian National Centre for Ocean Information Services (INCOIS) and the National Institute of Ocean Technology (NIOT) under the MoES also undertake dedicated research and development activities on tuna fisheries. Further, the Wildlife Institute of India (WII), an autonomous body under the Ministry of Environment, Forest and Climate Change (MoEF&CC) is working on the development of programmes to monitor the marine mammals in the Indian EEZ.

Table 2: Tuna and allied resources nominal catch – gear-wise (in tonnes) from the coastal and oceanic fishery 2024

Species/group	Gillnet	Longline	Small purse seines	Gillnet-longline	Trawl	Pole and line	Trolling	Handline	Beach Seine	Harpoon	Other gears	Total
Thunnus albacares	6005	12149	321	4870	1998	1354	1184	846	414			**29141**
Katsuwonus pelamis	11284	2955	61	9724	553	5634	732					**30943**
Thunnus obesus	46	16	3	0	0	172	94	115				**446**
Makaira spp.	1513	8264	0	3043	253		2					**13075**
Istiophorus platypterus	3006	3137	89	2420	642		105				2	**9401**
Xiphias gladius	633	317	0	617	103			2				**1672**
Pelagic sharks	483	9021	0	786	1125			16			37	**11468**
Auxis rochei	3031	1749	5869	322	562						2	**11535**
Thunnus tonggol	3415	50	2758	284	29							**6536**
Euthynnus affinis	11497	3106	21068	2562	2669	335	355		17		13	**41622**
Auxis thazard	6867	2046	6790	797	684	526					5	**17715**
Sarda orientalis	433	62	243	58	78							**874**
Scomberomorus commerson	7528	4791	3973	894	9901				15		77	**27179**
Scomberomorus guttatus	9797	172	1308	24	4256				1		190	**15748**
Acanthocybium solandri	247	320	88	299	116							**1070**
Others	218	474	16	0	2	205	1078	1074	1	172		**3240**
Total	**66003**	**48629**	**42587**	**26700**	**22971**	**8226**	**3550**	**2053**	**448**	**172**	**326**	**221665**

8.0 Status of implementation of scientific Committee recommendations and Resolutions of the IOTC relevant to the Scientific Committee

Res. No.	Resolution	Scientific requirement	CPC progress
12/04	On the conservation of marine turtles	Paragraphs 3, 4, 6–10	- All the five species of marine turtles reported from the Indian waters are protected under the law. - The authorised longliners regularly record and report interactions with marine turtles and this information is reported to the IOTC. - The Central Institute of Fisheries Technology is carrying out research on use of circle hooks and the findings have been reported in Journal of Fishery Technology (53 (2016): 284 – 289) and the Indian Journal of Fisheries (Vol. 60(1), 2013 Pp 21-27). - FSI also carries out research on the use of circle hooks and research finding have been published in the Journal 'Current Science' (Vol. 98, No. 10, Pp – 1378-1384 Varghese et al., 2010). -To create awareness, FSI also brings out popular articles in its in-house publications namely, Meena News and Bulletin of the Fishery Survey of India. -The entire stretch of the coastline where mass stranding of turtles takes place in India is protected through national and state legislations and no fishing activity is permitted to be carried out in such areas. Further, the Department of Forest and the Indian Coast Guard monitors the implementation of the conservation measures for protection of marine turtles. - The coastal states where mass stranding takes place have also made it mandatory on the use of Turtle Excluder Devices in the trawl nets.
12/06	On reducing the incidental bycatch of seabirds in longlinefisheries.	Paragraphs 3–7	There were no reported instances of sea bird interactions in any of the Indian tuna 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	The Indian authorized longline vessels are implementing this resolution and the same is reported to IOTC.
13/04	On the conservation of cetaceans	Paragraphs 7– 9	The national legislation prohibits capture and trade of marine mammals in Indian waters.
13/05	On the conservation of whale sharks (*Rhincodontypus*)	Paragraphs 7– 9	The national legislation prohibits capture and trade of whale sharks in Indian waters.
13/06	On a scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries	Paragraph 5–6	The Wild Life (Protection) Act, 1972 and various orders issued by the Ministry of Environment, Forest and Climate Change and the Ministry of Commerce provide for conservation of shark species in Indian EEZ. Further, a National Plan of Action (NPOA) on Conservation and Management of Sharks is under finalization.
15/01	On the recording of catch and effort by fishing vessels	Paragraphs 1–10	The authorized longline vessels are collecting the catch and effort data and providing the same to the IOTC on regular basis.

	in the IOTC area of competence		
15/02	Mandatory statistical reporting requirements for IOTC Contracting Parties and Cooperating Non-Contracting Parties (CPCs)	Paragraphs 1–7	The mandatory statistical reporting is carried out on regular basis.
17/05	On the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 6, 9, 11	- The data collected from the authorised longlining vessels are submitted to IOTC to meet the reporting requirements. - The national legislation provided for conservation of shark species, including landing of sharks with fin attached. -India has a national programme on elasmobranchs that includes stock assessment and conservation. A decision on India's participation in the proposed project will be taken after the details on the project are known.
18/02	On management measures for the conservation of blue shark caught in association with IOTC fisheries	Paragraphs 2-5	-Data is recorded and furnished to the IOTC -Data collection programmes are in place -Catches are being monitored domestically -Scientific research on blue sharks is being undertaken and results has been published (e.g., Varghese et al., 2017)
18/05	On management measures for the conservation of the Billfishes: Striped marlin, black marlin, blue marlin and Indo-Pacific sailfish	Paragraphs 7 – 11	India is adopting a number of management measures for conservation of fishery resources (including billfishes) in its seas, most important of which is annual ban on fishing for two months. Catches are being monitored and reported to the IOTC
18/07	On measures applicable in case of non-fulfilment of reporting obligations in the IOTC	Paragraphs 1, 4	India is regularly reporting the fishery and other data in respect of all IOTC fisheries; including shark species caught in association with IOTC fisheries, and is working in collaboration with the IOTC Secretariat to improve the data collection for direct and incidental catches. India had submitted the zero/positive matrix by IOTC species as well as the most commonly caught elasmobranch species in the IOTC format while submitting the mandatory catch, effort and size data
19/01	On an Interim Plan for Rebuilding the Indian Ocean Yellowfin Tuna Stock in the IOTC Area of Competence	Paragraph 22	The provisions under this Resolutions do not apply on India
19/03	On the Conservation of Mobulid Rays Caught in Association with Fisheries in the IOTC Area of Competence	Paragraph 11	India has a national sampling programme, for all the fish caught, including Mobulid rays caught by artisanal fishery. The fishery and biology data are being collected at national as well as state (province) levels
21/01	On an Interim Plan for Rebuilding the Indian Ocean Yellowfin Tuna Stock in the IOTC Area of Competence	Paragraph 23	The provisions under this Resolutions do not apply on India
23/07	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraphs 3–7	There were no reported instances of sea bird interactions in any of the Indian tuna fishery. No fishery south of 25°S
23/08	On electronic monitoring standards for IOTC fisheries	Paragraphs 3c	India is not implementing electronic monitoring system in tuna fisheries

24/04	On a regional observer scheme	Paragraph 12	All authorized tuna longliners are covered by the observer programme. Further, the requirements for monitoring the artisanal fishing vessels landing at the landing sitesare also carried out by the field samplers.

9.0. Literature cited

Anon, 2011. Report of the Working Group for revalidating the potential of fishery resources in the Indian EEZ. Report submitted to the Dept. of Animal Husbandry Dairying and Fisheries, Ministry of Agriculture, Government of India. Pp. 69.

Anon, 2018. Report of the Working Group for revalidating the potential of fishery resources in the Indian EEZ. Report submitted to the Dept. of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India.

CMFRI, 2018. *CMFRI Annual Report 2017-2018*. Technical Report. CMFRI, Kochi.

CMFRI, 2020. CMFRI Annual Report 2017-2018. Technical Report. CMFRI, Kochi.

FAO Fisheries and Aquaculture Department, 2009.Guidelines to reduce sea turtle mortality in fishing operations. Rome, FAO. 2009. 128pp.

FAO Fisheries and Aquaculture Department, 2018. Report of the Expert Workshop on means and methods for reducing marine mammal mortality in fishing and aquaculture operations, Rome, 20-23 March 2018. FAO Fisheries and Aquaculture Report No. 1231 FIAO/R1231 (En).

Government of India, Department of Fisheries, 2020. States/UTs wise Inland and Marine Fish Production during 2014-15 to 2018-19(In lakhs Tonnes). http://dof.gov.in/statistics

Gulati, D. K., S. Ramachandran, H.D.Pradeep, L.Ramalingam, 2020. Standardization of hooking rate (hr) for Swordfish (*XiphiusGladius*) occurring around Western Indian Ocean (Area 51) and Eastern Indian Ocean (Area57) based on survey data collected through FSI Surveys IOTC-2020-WPB18-19.

Kizhakudan, SJ, Zacharia PU, Thomas S, Vivekanandan E and Muktha M, 2015. CMFRI Marine Fisheries Policy Series -2; Guidance on National Plan of Action for Sharks in India. Central Marine Fisheries Research Institute, Kochi, pp. 1-102. ISBN ISSN 2394-8019.

Rohit, P., Abdussamad, EM, Koya KPS, Sivadas M. and Ghosh S, 2011. Tuna Fishery of India with Special Reference to Biology and Population Characteristics of Neritic Tunas Exploited from Indian EEZ. Central Marine Fisheries Research Institute, IOTC-2011-WPNT01-10.

Varghese S., Somvanshi, V.S. and Varghese, S. P., 2007.Bycatch of sharks and incidental catches of sea turtle in the long line fishery of Indian waters as observed during tuna resources survey. IOTC2007-WPEB-13-rev.

Varghese S.P., Unnikrishnan N., Gulati DK and Ayoob AE, 2017.Size, sex and reproductive biology of seven pelagic sharks in the eastern Arabian Sea. Journal of the Marine Biological Association of the United Kingdom, 97 (1): 181–196.

Varghese SP, Varghese S and Somvanshi VS, 2010. Impact of tuna longline fishery on the sea turtles of Indian seas. Current Science, (10), 1378-1384.

Sijo P. Varghese, Sanjay Pandey, A. Siva, R. Jeyabaskaran, 2021. Nominal catch of tropical tunas by artisanal and industrial fishery in the IOTC area of competence. IOTC–2021–WPTT23–17.

Siva A., Kiran S. Mali, Rajashree U. Pawar, Swapnil S. Shirke, Harshavardan D. Joshi, Tripta Singh, Ashok S. Kadam, Ansuman Das, S. Ramachandran, N. V. Ramanamurthy, CH. Bhaskar, Bapu M. Raut, Ashish Kumar, YogeshGangurde and Vinod Kumar Mudumala, 2021. Stock structure of billfishes observed during the exploratory surveys in the Indian Exclusive Economic Zone- A Decadal study IOTC-2021-WPB19-INF01.

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