

Update on the status of tuna fisheries in India

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INTRODUCTION

Artisanal fisheries for tunas existed in India from time immemorial. However, this fishery was confined to certain pockets of the country, mainly in the Lakshadweep Islands. In the recent past, the tuna fishery in India has expanded mainly by the encouragement through the Government policies for diverting the overcapacity in the continental shelf areas to the oceanic waters. Results of the survey conducted by the Government agencies, revealing high potential for tuna fisheries in the waters around India attracted the entrepreneurs to oceanic fisheries and slowly, but steadily, the country is emerging as a major tuna fishing country in the region. However, this expansion is allowed taking care of the potential as well as the share of the nation in the tuna stocks of the Indian Ocean as a coastal nation.

The total production of tunas and tuna-like fishes, including neritic and oceanic tunas, billfishes and seerfishes during the year 2009 was 135262 tonnes, against a total production of 158,458 tonnes during the year 2008. There was a reduction in production by the coastal fishery (132114 t in 2009 against 155619 t in 2008) as well as oceanic fishery (3148 t in 2009 against 2839 in 2008). There was considerable reduction in the quantity of tuna exports during the financial year 2009-10 in comparison with the year 2008-09 (21936 t against 31094 t).

GENERAL FISHERY STATISTICS

a. Data collection

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 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 received by the Fishery Survey of India (FSI) from the Indian owned tuna fishing vessels operating under the Letter of Permission (LOP) scheme formed the data source. As the catches are in gilled and gutted form, the nominal catch was worked out by applying a raising factor of 1.15.

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

b. Catch by species, area and gear

Tunas and tuna-like fishes landed in the coastal fishery during the year 2009 from the different geographical segments of the Indian EEZ was 132114 tonnes (against 155619 in 2008), out of which,

74711 tonnes from the west coast of mainland and 57403 tonnes from the east coast. The larger tunas formed 22.63%, neritic tunas 30.90%, billfishes 6.87% and seerfishes 39.61%.

The production from the Fishing Areas 51 and 57 was 74711 tonnes and 57403 tonnes (Table 1) , i.e., 56.6% and 43.4% respectively. About 85% of skipjack, 51% of yellowfin and 100% of Bigeye tunas, caught by the coastal fishery was from the area 51. The neritic tunas, except kawakawa, were obtained in higher proportion from the fishing area 51, whereas the catch of kawakawa was found to be more or less equal from both the fishing areas.

The tuna fishery was supported by eleven species; four oceanic species and seven neritic species. Oceanic species formed 42.3% and neritic species 57.7%. Among the oceanic species, skipjack and yellowfin were dominant contributing 15591 tonnes and 13228 tonnes respectively. Among the neritic tunas, kawakawa was dominant (61.06%) followed by longtail tuna (14.97%), frigate tuna (12.83%) and other species.

In the tuna landings from the coastal fishery, 52% was obtained in gillnet followed by hook and line (14%), purse-seine (8%), pole and line (8%), ring seine (3%) and the remaining by other gear combinations. The catch details obtained by different gears are given in Table 2.

The nominal catch of tunas and allied species from the oceanic fishery was 3147.95 tonnes (Table 3), out of which yellowfin tuna contributed 53.39%. Billfishes accounted for about 46% of the catch.

The cumulative catch of oceanic tunas from the coastal and oceanic fishery was 31571.80 tonnes, formed of yellowfin (49%), skipjack (47%), bigeye (3%) and albacore tuna (1%).

Table 1. Nominal catch of tuna and tuna-like fishes from the coastal fishery in India: 2009

(unit : tonnes)

Species	FAO Area 51	FAO Area 57	Total
Yellowfin Tuna	6679	6549	13228
Bigeye Tuna	829	0	829
Skipjack Tuna	13174	2417	15591
Albacore	199	44	243
Longtail Tuna	6111	0	6111
Bullet Tuna	2548	945	3493
Frigate Tuna	3372	1868	5240
Leaping Bonito	207	0	207
Kawakawa	12502	12429	24931
Dogtooth Tuna	45	0	45
Striped Bonito	519	281	800
Tunas total	46185	24533	70718
Sailfish	4161	2189	6350
Black Marlin	784	1302	2086
Swordfish	598	38	636
Billfishes total	5543	3529	9072
Wahoo	138	91	229
Narrow-Barred Seerfish	16248	13778	30026
Indo-Pacific Seerfish	6582	15470	22052
Streaked Seerfish	15	2	17

Seerfishes total	22983	29341	52324
GRAND TOTAL	74711	57403	132114

Source: Central Marine Fisheries Research Institute

Table 2. Gear - wise nominal catch of tuna and tuna-like fishes from the coastal fishery in India : 2009

(unit : tonnes)

Species	Gill net	Purse seine	Ring seine	Pole & Line	H&L	Gill net/H&L	Others	Total
Yellowfin Tuna	4948	84		1996	2626	1480	2094	13228
Bigeye Tuna	805					24	0	829
Skipjack Tuna	6094	5		7982	500	690	320	15591
Albacore	228	15					0	243
Longtail Tuna	3556	2301			4	32	218	6111
Bullet Tuna	928	10	134		2305	79	37	3493
Frigate Tuna	1321	1917	76		276	149	1501	5240
Leaping Bonito					207		0	207
Kawakawa	13138	2394	2795		4231	759	1614	24931
Dogtooth Tuna						45	0	45
Striped Bonito	337		1		244	142	76	800
Tunas total	31355	6726	3006	9978	10393	3400	5860	70718
Sailfish	3220				2030	1043	57	6350
Marlin	364				974	717	31	2086
Swordfish	231				8	304	93	636
Billfishes total	3815				3012	2064	181	9072
Wahoo	101				4	124		229
Narrow-Barred Seerfish	17350	3728	400		4775	433	3340	30026
Indo-Pacific Seerfish	15602	529	14		394	9	5504	22052
Streaked Seerfish	10	5					2	17
Seerfishes total	33063	4262	414	0	5173	566	8846	52324
GRAND TOTAL	68233	10988	3420	9978	18578	6030	14887	132114

Source: Central Marine Fisheries Research Institute

Table 3. Nominal catch of tunas and allied species from the oceanic fishery

(unit : tonnes)

Species	Indian owned vessels	FSI vessels	Total
Yellowfin tuna	1677.25	3.34	1680.58
Bigeye tuna		0.18	0.18
Skipjack		0.04	0.04
Sailfish	418.14	0.74	418.88
Swordfish	543.37	0.63	544.00

Marlin	499.26	0.14	499.40
Others		4.86	4.86
Total	3138.02	9.92	3147.95

Table 4. Structure of tuna longline fleet in India : 2009

OAL (m)	Converted vessels		Indian owned vessels	Total
	MPEDA scheme	MOA scheme		
12.0 – 15.9	147			147
16.0 – 19.9	66			66
20.0 – 23.9	11	9	21	41
24.0 – 39.9	1	1	4	6
40.0 – 59.9			35	35
Unspecified			8	8
Total	225	10	68	303

Table 5. Export of tunas and tuna products from India during 2001-02 to 2009-10

Year	Quantity (tonnes)	Value	
		Rs (million)	US \$ (million)
2001 - 02	1230	42.4	0.89
2002 - 03	3928	139.8	2.9
2003 - 04	6137	228.6	4.99
2004 - 05	8141	315.3	7.02
2005 - 06	16627	693.1	15.68
2006 - 07	23788	1303.8	29.54
2007 - 08	37302	2313.8	57.62
2008 - 09	31094	2679.7	61.12
2009 - 10	21936	1657.8	35.05

Source: Marine Products Exports Development Authority

C. Fleet structure

The coastal fishery has a large assemblage of fishing boats, mainly gillnetters, purse-seiners, ring-seiners, hook and line boats etc. which are not targeted on tunas, but contributing significantly to the tuna landings.

Pole and line boats are doing targeted fishing for tunas in the Lakshadweep waters and the number of boats engaged in the fishery is 365.

During the 10th five year plan (2002–2007), under the centrally sponsored scheme on “Development of marine fisheries, infrastructure and post-harvest operations”, the Ministry of Agriculture, Government of India has been providing subsidy of Rs.1.5 million (about US \$ 32,000) per vessel for conversion of existing trawlers above 20m OAL for tuna longline fishing. Under this scheme, ten shrimp trawlers in the size range of 21.5–24.0 m OAL were converted for tuna longline fishing.

The Marine Products Export Development Authority (MPEDA) had introduced in the 10th five year plan a scheme for providing subsidy of Rs. 0.75 million (about US \$ 16,000) 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 the subsidy and converted for tuna longline fishing.

Under the Letter of Permission (LOP) scheme of the Ministry of Agriculture, 60 tuna longline vessels in the range of 21.6 - 58.7 m OAL, which are of foreign origin, but registered as Indian vessels, have been permitted for fishing in the Indian waters.

The structure of the tuna longline fleet is given in table 4. All the converted tuna longline vessels are using monofilament long lining system.

2. RECENT ADVANCES IN TUNA RESEARCH

Biology, distribution and abundance of tuna and allied species of Indian waters are continuously monitored utilizing the facilities onboard four research vessels of Fishery survey of India

Bar coding of six species of tunas from the southwest region and four species from the northwest region of the Indian EEZ has been standardized

Fecundity and spawning season of five species of tuna from different regions along the Indian coast have been estimated.

Preliminary stock assessment indicated that neritic tuna production is very close to the MSY level at many centers and that more than 88% of the resource potential is exploited.

3. NATIONAL RESEARCH PROGRAMMES CURRENTLY IN PLACE

Survey of oceanic tunas and allied resources in the Indian EEZ by deploying four tuna longliners, two each on the Arabian sea and Bay of Bengal, is being undertaken by the Fishery Survey of India (FSI), under the Ministry of Agriculture. Data on resource distribution, CPUE, by-catches and environmental conditions are being collected. Biological studies of all the species occurring are also undertaken.

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 progress.

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), Cochin (southwest coast), Tuticorin (southeast coast) and Vishakapatnam (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) has been initiated from 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, improvement of handling practices on board 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 with the participation of 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.

Trophic ecology of large pelagic predatory fishes in the western Indian EEZ has been undertaken by a scientist from the FSI as part of Ph.D programme. Trophic studies of tunas form the most significant part of the work. Results of the studies were presented in the Working Party on Ecosystem and Bycatch meeting during 2010.

Research work on "Dynamics of fishery, biology and utilization of coastal tunas occurring in the northwestern Indian EEZ" by a scientist from the FSI as part of Ph.D programme also is completed. DNA bar coding to identify phylogenetic relationship within the species and between the species through Cytochrome Oxidase I (CO I) gene is an important component in the study.

4. IMPLEMENTATION OF THE RECOMMENDATIONS OF THE SCIENTIFIC COMMITTEE

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 for tuna longliners and it is proposed to print and distribute to the tuna longline operators.

Studies are being undertaken on depredation from four tuna longline survey vessels of the Government of India.

Studies on by-catch are being undertaken from four tuna longline survey vessels of the Government of India.

The commercial vessels, through the logbook proposed to be 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 fabrication and popularization of TEDs, conducting awareness campaigns and protection under Wildlife Protection Act have been implemented.

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.

5. CONCLUSION

An increasing number of Indian fishermen are venturing in tuna fishing in the EEZ. They are currently harvesting of oceanic tunas with the existing fleet. However, some entrepreneurs are introducing new vessels to the fleet. Attempts are being made to create awareness about tuna longlining and necessary R & D support is being provided by the government institutions. There is, however, scope for fine tuning of the data collection process from the targeted fishery and this issue is receiving government's attention. The country 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 the coastal fishermen.