

NATIONAL REPORT ON TUNA FISHERIES, RESEARCH AND DEVELOPMENT  
IN INDIA

V.S. Somvanshi<sup>1</sup>, S. Varghese<sup>1</sup> and NGK Pillai<sup>2</sup>

<sup>1</sup> Fishery Survey of India, Mumbai and <sup>2</sup> Central Marine Fisheries Research Institute, Kochi

**Introduction:**

Marine fishery sector in India occupies a very important place in the Socio-Economic development of the country in general and the fishermen community in particular. A long coastline of 8118 kms, 0.5 million sq. kms of continental shelf and 2.02 million sq. kms of Exclusive Economic Zone (EEZ) with varied and rich fish resources bolster the socio-economic well being of the nation and the fishermen community (dependent for livelihood). The Indian EEZ also encompasses two archipelagoes, namely, Andaman & Nicobar Islands and Lakshadweep Islands. The marine fish production during 2003-04, was estimated to be 2.9 million tonnes against the harvestable potential of 3.9 million tonnes. About 2.8 lakh fishing crafts consisting 1.81 lakh non-motorized traditional crafts, 0.45 lakh motorized traditional crafts and 0.54 lakh mechanized boats including the deep-sea and oceanic fishing crafts contribute to the present harvest. Tuna and tuna like fishes form a significant component of both the coastal as well as oceanic fisheries in the Indian Waters. India has been pragmatically addressing various issues related to marine fisheries development, sustainability, management and conservation of the fish stocks. These issues form part of the Five Year Plan national schemes duly supported by similar effort by the coastal states (provinces).

This report presents recent developments in coastal and tropical tuna fisheries, by-catches, national data collection and processing systems, implementation of recommendations of Scientific Committee and current research programmes.

**1. Tuna production in India:**

India's production of tunas and tuna like fishes during 2005 was about 82449 tonnes. Of this, 80506 tonnes was contributed by coastal fishery. The neritic tunas contributed to about 37 thousand tonnes, billfishes three thousand tonnes, and seer fishes 40 thousand tonnes. The principal components of neritic tunas are skipjack, kawakawa, frigate mackerel and yellowfin tuna, while the main species of seer fishes were *Scomberomorus commerson*, *S. guttatus*, *wahoo* and *Acanthocybium solandri*. The main gears used were gillnets, pole and line, hook and line and longlines.

The quantum of tunas and allied resources caught by the longliners were to the tune of 1943 tonnes. Longline catches by the survey vessels from the Indian EEZ during 2005 was 46.4 tonnes, yellowfin tunas and billfishes being the main components of the catch. Under the industrial fishing, 72 Indian owned tuna longliners were in operation with a provisional estimated catch of 1856 tonnes. Under the new scheme of converting the shrimp trawlers to tuna longliners, six vessels were in operation and those vessels landed about 42 tonnes of tunas.

a) Coastal fisheries:

The Tunas and allied species caught from Coastal fisheries are comprised of *Euthynnus affinis*, *Auxis thazard*, *A. rochei*, *Thunnus tonggol*, *T. albacares*, *Katsuwonus pelamis* and *Sarda orientalis*. The main gears operated in this sector are Gill nets, Pole and Line, Purse seine and Hook and Line. The species-wise and gear-wise catch details are given in Table - I. (Varied types of crafts are used, artisanal, non-motorized and motorized boats and small and medium mechanized boats).

Table-I: Coastal fisheries - Catches by species and gear:

Drift gill net		Purse seine	
Species	Catch (t)	Species	Catch (t)
<i>E. affinis</i>	16626	<i>E. affinis</i>	354
<i>A. thazard</i>	2377	<i>A. thazard</i>	58
<i>A. rochei</i>	888	<i>A. rochei</i>	58
<i>T. tonggol</i>	3164	<i>T. tonggol</i>	0
<i>K. pelamis</i>	720	<i>K. pelamis</i>	0
<i>T. albacares</i>	1802	<i>T. albacares</i>	0
<i>S. orientalis</i>	52	<i>S. orientalis</i>	0
<b>Total</b>	<b>25629</b>	<b>Total</b>	<b>470</b>
Hook and Line		Other gears	
Species	Catch (t)	Species	Catch (t)
<i>E. affinis</i>	4453	<i>E. affinis</i>	756
<i>A. thazard</i>	757	<i>A. thazard</i>	290
<i>A. rochei</i>	1201	<i>A. rochei</i>	175
<i>T. tonggol</i>	1125	<i>T. tonggol</i>	226
<i>K. pelamis</i>	398	<i>K. pelamis</i>	58
<i>T. albacares</i>	1673	<i>T. albacares</i>	0
<i>S. orientalis</i>	19	<i>S. orientalis</i>	220
<b>Total</b>	<b>9626</b>	<b>Total</b>	<b>1725</b>
Pole and Line		All Gears	
Species	Catch (t)	Species	Catch (t)

<i>E. affinis</i>	0	<i>E. affinis</i>	22189
<i>A. thazard</i>	0	<i>A. thazard</i>	3482
<i>A. rochei</i>	0	<i>A. rochei</i>	2322
<i>T. tonggol</i>	0	<i>T. tonggol</i>	4515
<i>K. pelamis</i>	2060	<i>K. pelamis</i>	3236
<i>T. albacares</i>	438	<i>T. albacares</i>	3913
<i>S. orientalis</i>	0	<i>S. orientalis</i>	291
<b>Total</b>	<b>2498</b>	<b>Total</b>	<b>39948</b>

Source: Central Marine Fisheries Research Institute

b) Oceanic fisheries:

In the Oceanic fisheries, the target species are yellowfin and skipjack tunas. However besides these species other fishes contributing to the catch were sword fish, sail fish, blue marlin, bigeye tuna, sharks, wahoo and barracudas. The exploratory surveys are designed for assessment of abundance indices of yellowfin tuna, big-eye tuna, sail fish and sword fish. The gears used in these efforts are conventional multi-filament longlines and monofilament longlines. The catches of the survey vessels and industrial vessels fishing in the Indian EEZ are given in Table-II. The preliminary estimates indicate that the survey vessels have caught 46 tonnes and industrial longliners harvested 1897 tonnes of tuna and allied species with a total contribution of about 1943.7 tonnes.

Table: II -Oceanic fisheries - Catches by species :

Species local name	Survey vessels (t)	Industrial longline vessels (t)#	Total (t)
Yellowfin tuna	23.2	1771.9	1795.1
Skipjack tuna	0.3	0	0.3
Sword fish	0.6	44.3	44.9
Sail fish	6.1	40.8	46.9
Blue Marlin	0.5	39.7	40.2
Shark	10.7	0	10.7
Others	5.0	0.6	5.6
<b>Total</b>	<b>46.4</b>	<b>1897.3</b>	<b>1943.7</b>

Source: Fishery Survey of India

# Provisional

c) By-catches:

The by-catches of tuna fisheries mainly pertain to bill fishes, sharks, wahoo and barracudas. The preliminary estimate of these catches in the oceanic fisheries is 16.3 tonnes.

**d) Fleet Structure:**

The fleet structure in the coastal and oceanic fisheries is given in Table-III. The traditional crafts, motorized traditional crafts and mechanized boats are deployed in coastal fisheries for tunas seasonally. The six shrimp trawlers were converted to tuna longliners under the scheme on diversification of fishing. The tuna longliners include the survey vessels and the commercial vessels.

**Table-III: Details of the fishing crafts:**

Type of craft	No. of crafts
Traditional crafts	181284
Motorised traditional crafts	44578
Mechanised boats	53684
Trawlers converted to longliners	6
Tuna longliners	76
<b>Total</b>	<b>280573</b> (Including catamarans and beach landing crafts)

*Source: Ministry of Agriculture, Govt. of India*

**National data collection and processing system:**

The Government of India during its X Five year Plan (2002-07) has launched a scheme on strengthening of database and information networking for the fisheries sector. This scheme is aimed to improve the database of marine fishery resources by adopting standardized method of data collection through sample survey and estimations of marine fish production by using information technology. A standardized national data collection methodology of stratified random sampling as detailed in the national report presented to IOTC (IOTC-SC-03-Imf.6) is being uniformly implemented by all the maritime states (provinces). Enumerators and statisticians involved in collection of data in the field and data processing are trained in workshop-cum-training arranged in the respective Maritime Provinces. The data pertaining to tuna and tuna-like fishes are also collected as part of this scheme following the common methodology. The system of hitherto receiving the fish production statistics from the maritime states directly by the Dept. of Animal Husbandry, Dairying & Fisheries (Ministry of Agriculture, Government of India) has been changed to receiving the data by the Fishery Survey of India (FSI) as an interphase between the maritime states and Government of India. Monitoring is done through three tier system, firstly by FSI on monthly basis, secondly by a Committee

consisting of FSI and Ministry officials and finally by the Technical Monitoring Committee at the Ministry level.

The data collection system is supported with information technology by providing servers with clients with software needed for processing the data alongwith other requisite equipment to the maritime States, Central institutes and Ministry.

During the year 2005, marine fisheries census encompassing the fishermen population, their fishing crafts and gear was undertaken for main land and Andaman & Nicobar and Lakshadweep groups of islands by the Central Institutes, CMFRI and FSI respectively. The preliminary findings of the census shows that the fisherfolk population of the country is estimated to be 35.75 lakhs belonging to 3322 fishing villages and 1414 landing centres.

## **2. Implementation of recommendations of the Scientific Committee:**

In order to monitor and initiate further action on IOTC decisions/resolutions the Dept. of Animal Husbandry, Dairying & Fisheries (Ministry of Agriculture, Government of India) has constituted a Working Group. The Working Group meets from time to time to examine the provisions under Resolutions and suggests appropriate actions on conservation and management measures for tuna and allied species. The survey and research activities are also given orientation to collect scientific data as required under various resolutions and activities of IOTC.

## **3. Scientific research programmes:**

### **Fishery Survey of India:**

- Survey of oceanic tuna and allied resources using regular longline in Indian EEZ along North West Coast between Lat. 14<sup>0</sup> - 23<sup>0</sup>N.
- Tuna resources survey using regular longline in Indian EEZ around Andaman and Nicobar Islands between Lat. 5<sup>0</sup> - 15<sup>0</sup> N.
- Tuna resources survey using Monofilament longlining in the Arabian Sea including Lakshadweep between Lat. 4<sup>0</sup> and 23<sup>0</sup>N.
- Tuna resources survey using Monofilament longlining in the Bay of Bengal including Andaman Sea between Lat. 10<sup>0</sup> and 21<sup>0</sup>N.
- Species specific fishery forecast with special reference to oceanic tunas in collaboration with Space Application Centre of Indian Space Research Organization using satellite remote sensing technique.

- Investigation in marine fish biodiversity in the Indian EEZ in collaboration with Ministry of Environment and Forests.

The Survey and research objectives under the above projects are;

- Estimation of abundance index of oceanic tuna and allied resources.
- Identifying spatio-temporal distribution pattern of the above species.
- Study the biological parameters in respect of important species.
- Study of oceanographic parameters influencing tuna and swordfish distribution.

#### **Central Marine Fisheries Research Institute:**

- Assessment of exploited marine fishery resources: Seer fishes, Coastal tunas and bill fishes.
- Appraisal of marine fisheries of maritime states including seer fishes and coastal tunas.
- Tuna resources of Indian EEZ - An assessment of growth and migratory patterns (in collaboration with FSI).

#### **International research project**

Small scale tuna tagging project in Lakshadweep Islands in collaboration with Indian Ocean Tuna Commission (IOTC) was undertaken by Fishery Survey of India. About 5,000 tunas consisting of Yellow Fin and Skipjack were tagged and released in two phases using Pole and Line and Troll line techniques, during 2005-06. The Fishery survey research vessel, Matsya Vrushti, was deployed for tuna tagging under this project during September and October, 2006 cruises. In this exercise 13 tunas, comprising 11 Yellowfin and 02 Skipjack tunas were tagged and released. This activity is being continued in the forth coming cruises of the vessel. So far, 226 recaptures of tunas are reported, of which 07 were Yellowfin and 219 were Skipjack tunas. The recaptures and its reporting are still anticipated.

Information on incidental catches, if any, of seabirds, turtles, marine mammals and on the instances of predation on longline caught tunas, is also being collected in the nationally designed projects. The national and international projects outlined above and being implemented in the Indian EEZ, are expected to supplement the initiatives in development, management and conservation of tuna fishery resources in the region.