Status of Indian tropical tuna fisheries in 2018

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Abstract

Small-scale and artisanal sectors largely contribute to the Indian tropical tuna fishery. This fishery deploys both mechanized and motorized boats using a variety of gears including gillnet, longline, pole and line, troll line and small purseseine. Pole and line fishery is restricted to the Lakshadweep archipelago, wherein artisanal fishermen target surface swimming skipjack tuna schools. The status of tuna and other large pelagics stocks in the Indian seas are constantly monitored employing four research vessels of Fishery Survey of India (FSI). The total catch of tropical tunas by Indian fishery during 2018 was 74,486.19 t. Yellowfin tuna was the principal species caught (50.33% of the total catch), while skipjack (48.85%) and bigeye (0.82%) were the other species of tropical tunas caught by this fishery. Gillnet remained the main gear contributing the tropical tuna catch (37.99%), followed by handline (15.97), pole and line (15.89), longline (11.62) and other gears. More than 60% of the catch was from the west coast (FAO Area 51), while the remaining catch originated from the east coast (FAO Area 57) of India. Results of biological studies of these three species are discussed in brief.

Introduction

The tunas are one of the most valuable fisheries in the Indian Ocean and the three tropical tunas yellowfin (*Thunnus albacares*); skipjack (*Katsuwonus pelamis)* and bigeye *Thunnus obesus*), together contribute more than half of the total Indian Ocean tuna catch. Indian Ocean tuna fisheries have been carried out since ancient times and some reports indicating its origin during the first millennium, mainly in Maldives, India and Sri Lanka are available. However, the industrialisation of the Indian Ocean tuna fishery began during 1952 when Japanese tuna longliners started tuna fishing in the eastern Indian Ocean. The fishery expanded rapidly and now Indian Ocean tuna accounts for 20% of the world tuna production.

The economic stability, food security and livelihood of many Indian Ocean coastal nations, especially Small Island Developing States (SIDS) heavily depends on this fishery. Further, the indirect benefits in the form of licenses, servicing to the Distant Water Fishing Nations (DWFN) industrial fleets, onshore processing, payments for supplies and fees received for the use of port facilities are contributing additional earnings for the Indian Ocean coastal states from tuna fishery.

Although India has a long history of tuna fishing dating back even to first millennium, especially in the Lakshadweep Islands, tuna fishing continues mainly as an artisanal activity except for a brief period of fishing by foreign fishing vessels under the chartered, joint venture and LOP schemes. However, all these schemes are presently rescinded and India is now developing a domestic tuna fishery.

Government of India, with the aim of reducing the fishing pressure on the coastal resources, had provided financial assistance during 2002–2007for conversion of existing trawlers (mainly shrimp trawlers) above 20 m OAL for tuna longlining. Few other Government agencies including Marine Products Export Development Authority (MPEDA) and National Fisheries Development Board (NFDB) had introduced schemes for providing financial assistance to existing vessels for conversion to tuna longline fishing and construction of small tuna fishing boats (all in the OAL <24 m, fishing within the Indian EEZ). These Government initiatives had fuelled the growth of Indian tuna fishing, resulting in a total catch of tropical tunas to the tune 74,486.19 t during 2018. However, this expansion is not in pace with the planned

programme under the Fleet Development Plan (FDP) submitted to, and endorsed by, the Indian Ocean Tuna Commission during 2011.

Materials and Methods

The marine fishery data collection in India is done by two methods a). Land-based sampling (by Fisheries Departments of State Governments/Union Territories (UT) and the Central Marine Fisheries Research Institute) and b) sea-based exploratory surveys (by Fishery Survey of India, FSI). The CMFRI along with the Fisheries Departments of the coastal States/UTs undertakes regular sampling and estimation of the fish landings from designated landing points throughout the coastline.

Besides estimating the fishery landings, studies on biological and socio-economic attributes of fisheries are also carried out by the institute on a regular basis. The Fishery Survey of India operates eleven research/survey vessels for collecting the sea truth data on the fish abundance, biology, oceanographic parameters etc. The tropical tuna landing data collected by CMFRI and States/UTs are analysed in the present paper.

Further, the survey results of four dedicated longliners of FSI, two based on the east coast and two on the west coast are also analysed. These modern longliners undertake exploratory surveys on a regular basis through pre-determined sampling programmes. The exploratory surveys provide information on tropical tuna resource distribution in the Indian EEZ, effort, and also various environmental parameters to correlate with the exploitation of tuna and allied resources.

Results and Discussion

Tropical tuna catch during 2018

The nominal catch of tropical tunas in 2018 was 74,486 t. The catch was dominated by yellowfin, contributing 50.33% to the total tropical tuna catch. Skipjack contributed 48.85% of the total catch. Contribution of bigeye tunas to the tropical tuna total catch was marginal (0.82%) (Figure 1). Area-wise landings indicate that, 60.40% of the total landings were from the west coast of India (FAO Area 51), whereas the remaining 39.60% was from the east coast (FAO Area 57) (Figure 2). About 65% of the yellowfin, 55.57% of skipjack and 61.22% of the bigeye landings were from west coast, whereas east coast landings constituted 34.93% of the yellowfin, 44.43% of skipjack and 38.78% of the biegye landings from India during 2018.

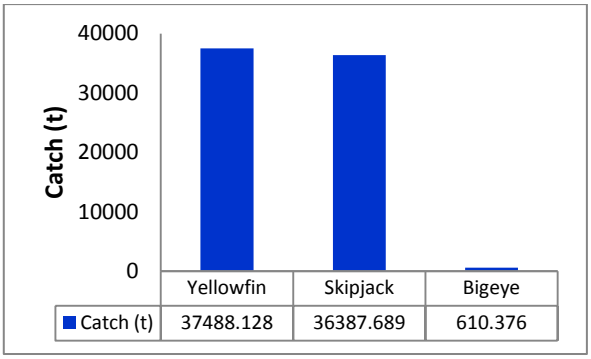

Figure 1 Nominal catch of tropical tuna species in India (2018)

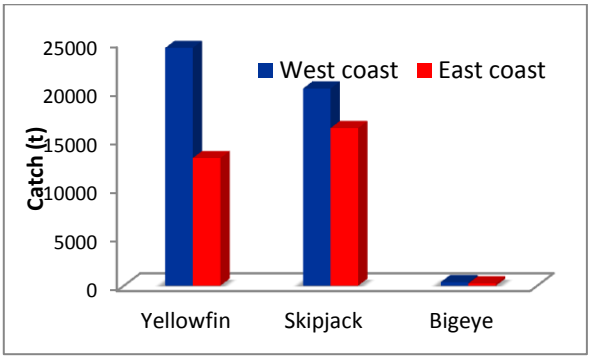

Figure 2 Pattern of tropical tuna catch in west and east coasts of India (2018)

There are eight fishing gears employed for catching these three tropical tuna species, yellowfin tuna (YFT), bigeye tuna (BET) and Skipjack tuna (SKJ). Drift gillnets remained the principal gear for exploitation of tropical tunas in India. This gear contributed 37.99% of the total landings of tropical tunas, 30.22 % of YFT, 46.53% of SKJ, and 6.25% of BET. Handline's share in Indian tropical tuna catch was 15.97% (total catch), 21.71%(YFT), 9.90% (SKJ) and 25.04% (BET). Pole and line fishery, practiced in Lakshadweep Islands (south-eastern Arabian Sea) contributed 15.89% of the total tropical tuna catch, 5.48% (YFT) and 26.29% (SKJ). Small longlines targetting fresh tuna was the next principal gear, contributing 11.62% of the total tropical

tuna catch, 18.52% (YFT), 4.18% (SKJ) and 31.18% (BET). Boats using the gears gillnet-cum-longline contributed 11.00% (total), 14.76% (YFT) and 7.30% (SKJ). Contribution by other gears to the tropical tuna catch of India during 2018 was marginal: troll (4.59%), small purse seine (2.94%). The exploratory longline (by Fishery Survey of India) vessels contributed a meagre 0.01% of the total tropical tuna catch of India during 2018 (Figure 3).

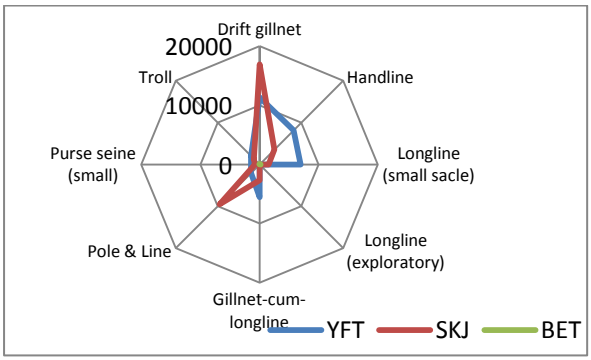

Figure 3. Tropical tuna catch (2018) by different gears

Biology

The length-weight structure, diet and reproduction of tuna species are being monitored by studying all the specimens recorded during exploratory surveys and samplings done during landing monitoring. Preliminary analysis of the data revealed the following:

The total length of the yellowfin tuna was in the range of 62-198 cm (mean length – 122.5 cm), weighing 6-95 kg (man weight – 33.65 kg). The length-weight relationship was given by $W = 0.048TL^{2.716}$ (length in cm; weight in g). The skipjack tuna was in the total length range of 38-101 cm; weighing 1.2-22 kg. The length-weight relationship was given by $W = 0.025TL^{3.012}$ (length in cm; weight in g). The bigeye tunas recorded in catch was in the length range of 56-106 cm, weighing 3-24 kg and the length-weight relationship of this species was $W = 0.006TL^{3.167}$.

Observations on the diet of YFT as revealed from the stomach contents shows that oceanic squids (mostly *Sthenoteuthis oualaniensis*) (37%), teleost fish (41%) and swimming crab (16%) constituted bulk of the diet whereas, octopus, pelagic shrimps and stomatopods were also observed to form YFT diet occassionally. Sex ratio recorded was 1:2.28 (F:M) and reproductively active adults were occurring in the catch during February-June. Diet of SKJ was mostly constituted by small teleosts (78%), followed by oceanic squids and octopus (16%) and pelagic shrimps and crab larvae (3%). Sex ratio estimated was 1:1.266 (F:M) and the reproduction was sporadic with peaks occurring during monsoon months. Diet of BET is observed to be dominated by oceanic squids (41%), teleost fishes (40%), pelagic shrimps (12%) and others. The sex ratio of the specimens sampled was 1:1.43 (F:M).

Conclusion

India, being a responsible fishing nation, adopts a number of regulatory measures to conserve its marine living resources. There is an Institutional mechanism for periodical estimation of management reference points for individual species. India observes an annual uniform ban on fishing by all mechanized fishing from 1 June to 31 July (along the west coast) and 15 April to 15 june (along the east coast) for the conservation and sustainable management of its marine resources. In addition to these specific measures, India is also regulating fishing practices through demarcation of about 31 Marine Protected Areas, fixing Minimum Legal Size (MLS) for capture of common species, gear-specific mesh size regulations, restrictions on operation of certain gears like ring seines, purse seines and pair trawling, introduction of by-catch reduction devices. Since tunas are highly migratory, the over exploitation in one region will influence the abundance in other regions. Therefore, the management of tuna stocks needs the cooperation of all the nations engaged in fishing.

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