

# **Management of Scombroid Fisheries**

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# Status of exploitation of coastal tunas in the Indian seas

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## ABSTRACT

Tuna and billfish production from Indian seas during the period 1985-'99 evinced an increasing trend and the landings fluctuated between 24,287 t (1987) and 53,662 t (1992). The average annual production during the said period was 40,204 t, contributing to 3.6% of the total pelagic fish landings and 1.8% of the total marine fish landings. On an average, 24% of the total tuna and billfish production during 1991-'99 was contributed by northwest coast, 2% by Andaman and Nicobar islands and 14.9% by Lakshadweep. Among the maritime states, Kerala (36%), Gujarat (18.1%), Tamilnadu (11.6%), Maharashtra (5.9%), Karnataka (5%), Andhra Pradesh (4.4%) and Goa (2%) were the prime tuna producing states. Gearwise production indicate that drift gill net (61%) was the dominant gear followed by hooks and line (16%), pole and line (15%), purse seine (6%) and troll line (2%). The major species which contributed to the tuna fishery were *Euthynnus affinis* (51%), *Auxis thazard* (22%), *Katsuwonus pelamis* (11%) and *Thunnus tonggol* (10%) with *Euthynnus affinis* and *Auxis thazard* occurring along both coasts while *Thunnus albacares* (young ones) were more abundant along the north-west coast. The size range of *E.affinis* in the fishery was 10-78 cm, *A.thazard* 16-48 cm, *K.pelamis* 18-74 cm, *T.tonggol* 30-98 cm and *T.albacares* (young ones) 58-138 cm with major modes at 48, 38, 54, 82 and 90 cm. Length frequency studies on *E.affinis* indicate that the major fishery supporting group is 34-58 cm along the west coast and 50-60 cm along the east coast. Suggestions for enhanced exploitation of coastal tunas are briefly presented.

## INTRODUCTION

The status of exploitation and stock assessment of tunas in the coastal fishery sector of the EEZ of India has been investigated and results published (Silas and Pillai, 1985; James and Pillai, 1993; James *et al.*, 1992, 1993; Yohannan *et al.*, 1993 and Pillai *et al.*, 1993). Due to various factors, the tuna fishery in the Indian EEZ is still limited to the small scale inshore sector, while the purse seine and longlining operations under the charter and joint venture schemes have encountered problems and been discontinued (Dixitulu, 2000). One of the important aspects in the management of tuna fishery is the development of a strong database for resource information, particularly acquisition of fishery data, its processing and dissemination (Silas, 1985). The present study has documented the tuna fishery in the inshore waters of the Indian EEZ during the period 1985-'99 and suggests

strategies for further development and management of the fishery.

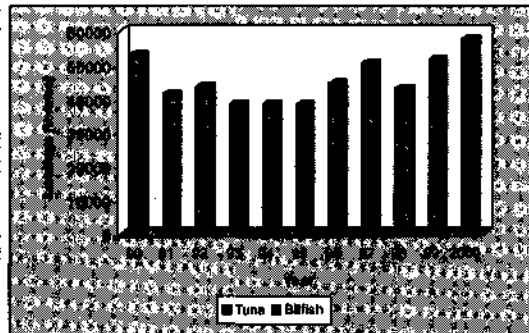
### MATERIALS AND METHODS

Catch statistics codified by National Marine Living Resource Documentation Centre (NMLRDC) of CMFRI on an all India basis, statewide and gearwise constituted the primary source of data. Data on catch, effort and species composition of different species of tunas collected from 7 Centres along the west and east coasts of the mainland during the period 1989-'98 were used in the present study. The resource is exploited chiefly by drift gill nets and hooks and line and partly by purse seines from the coastal waters. However, no standardization of the effort expended was made in the study.

### RESULTS

#### Production trend

Tuna and billfish production from Indian seas have fluctuated between 24,287 t (1987) to 53,662 t (1992). The average annual production of tunas and billfishes during 1985-'99 was 40,204 t which contributed to 1.8% of the total marine fish landings and 3.6% of the total pelagic



fish landings. Since 1993 catches show an increasing trend with estimated landing of 51,454 t in 1999, with the contribution by billfishes increasing while tuna catches have stabilized around 50,000 t. The average tuna production in the coastal sector during 1985-'89 was 31,063 t which increased to 41,738 t in 1990-'94 and further to 42,698 t in 1995-'99 registering an increase of 38% (Fig. 1).

Region-wise production trends indicate that during 1991-'99, mainland of India contributed 83% of the total tuna landings while the Lakshadweep seas and the Andamans seas contributed 15% and 2% respectively. State-wise, Kerala ranked first con-

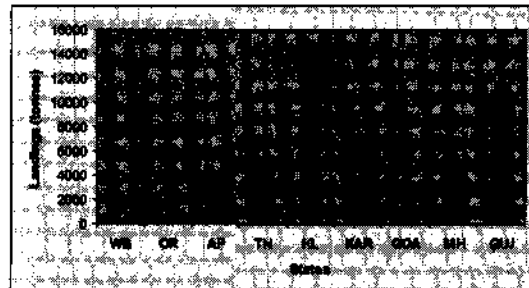


Fig. 2. Average state-wise landings of tunas and billfishes during 1991-'99

tributing 14,905 t (36 %) followed by Gujarat 8,045 t (18.1%), Tamilnadu 5,174 t (11.6%), Maharashtra 2,638 t (5.9%) and Karnataka 2,367 t (5%) (Fig. 2).

**Species composition**

The little tunny (*E.affinis*), frigate tuna (*A.thazard*), skipjack (*K.pelamis*) and the longtail tuna (*T.tonggol*) are the main species which contributed on an average 57%, 22%, 11% and 10% respectively of the total tuna landings during 1991-'99 with annual variations.

Table.1. Average species-wise all India estimated landings (t) of tunas during the period 1985-'99

Year/ species	<i>E.affinis</i>	<i>A.thazard</i>	<i>K.pelamis</i>	<i>T.tonggol</i>
1985-'89	18,054	5,882	2,206	791
1990-'94	20,577	6,768	5,463	2,929
1995-'99	16,882	7,907	2,508	5,560

It is seen that the landings of *E.affinis* peaked during 1990-'94 period and subsequently showed a decline. The landings of *K.pelamis* also show a similar trend. However, during the 1990-'99 period, the landings of *E.affinis* have remained more stable while *K.pelamis* showed a declining trend. The catches of *A.thazard* show a slight increasing trend while the catches of *T.tonggol* have increased dramatically from 791 t in the 1985-'89 period to 5,560 t during 1995-'99 period (Fig. 3).

**Length frequency distribution**

The length frequency distribution of

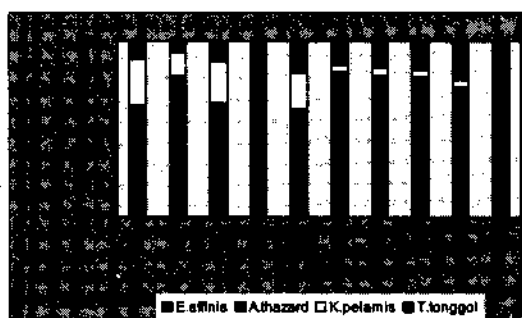


Fig. 3. All-India percentage species composition of tuna landings

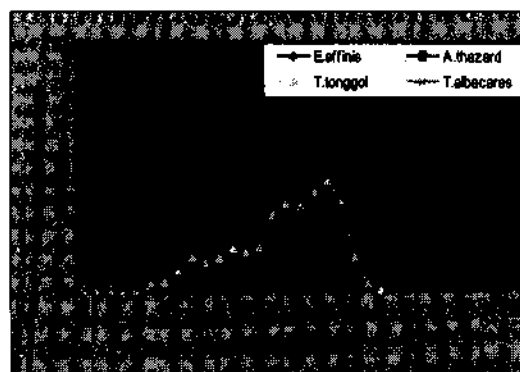


Fig. 4. Annual average length frequency distribution of tuna species during 1991-'98

*E.affinis* was 10-78 cm, 16-48 cm for *K.pelamis*, 30-98 cm for *T.tonggol* and 58-138 cm for *T.albacares* (young ones) (Fig. 4). The main species contributing to the tuna catches is *E.affinis* and the major fishery supporting group was in the 50-60 cm and 34-58 cm

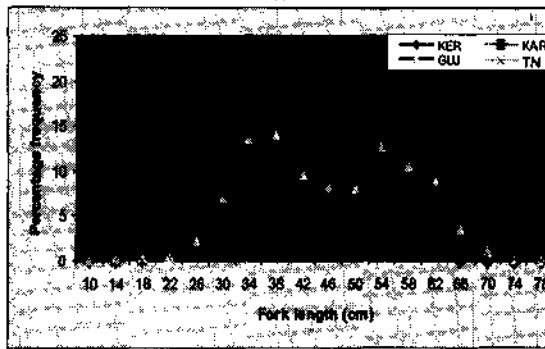


Fig. 5. Length frequency distribution of *E. affinis* along the Indian coast

size range along the east and west coasts respectively (Fig. 5)

## DISCUSSION

The production trend of tunas and billfishes indicate that the catch steadily increased from 1987 to reach a peak in 1993 and during 1997-'99 about 42,000 t were landed. The trend of landings indicate that the average tuna production in the coastal sector during 1985-'89 was 31,063 t which increased to 41,738 t in 1990-'94 and further to 42,698 t in 1995-'99 registering an increase of 38 % over the period. Large scale motorisation of country crafts which started in the early eighties have allowed the expansion of tuna fishing grounds while introduction of innovative gears, improved infrastructure facilities and increased demand for tuna in the internal and export market is responsible for the increase in tuna catches ( James and Pillai, 1993).

Region-wise landings indicate that 41 % of the total tuna catch was landed from the south-west coast, followed by 24 % from north-west coast and 17% from south-east coast .The landings from Kerala and Gujarat have considerably increased in recent years due to introduction of motorisation and mechanisation and also to the enhanced employment of drift gill nets in the fishery for large pelagics. This is reflected in the production figures from different regions and states of the mainland.

As stated earlier, *E.affinis* constituted the major species in the coastal tuna fishery (51%) followed by *A. thazard* (22%). An examination of all - India yearly species composition of tunas during 1991-'99 indicate that percentage composition of *T.tonggol* in the coastal fishery gradually registered an increase and during 1985-'99 it constituted 10% of the total tuna landings. *T.tonggol* is a species widely distributed in the shelf edge and slope waters and the expansion of the fishing grounds with enhanced exploitation of large pelagics from deeper areas being practised since 1994 may be the causative factor for the increased representation of this species in the total tuna landing. Similarly, the skipjack tuna landing recorded a decreasing trend.

The skipjack forms a significant fishery only in the Lakshadweep islands contributing around 75 % of the total tuna landings in the island. However, the fishery by India is confined to a narrow area and countries like Maldives and Sri Lanka take the major portion of the skipjack available in the area (Yohannan *et al.*, 1993). Regarding *E.affinis*, the fishery confined to the inshore areas is already exploited to the maximum and this could be a reason for the catches to have stabilized.

The average percentage frequency of length groups of *E.affinis* along the Indian coast during 1991-'98 indicate that along the west coast (Kerala, Karnataka, Gujarat) small sized specimens (24-40 cm) occurred in the fishery more frequently when compared with the east coast where 50- 60 cm sized specimens are more common.

Silas and Pillai (1985) and James and Pillai (1993) have suggested various measures for increasing the production of tunas from coastal and oceanic waters of the EEZ of India. Suggestions for enhancing tuna production from Indian seas are:

- Increasing fishing operations along the offshore waters of north-west and south-west coasts, Lakshadweep and Andaman and Nicobar islands.
- Increasing the operational efficiency of drift gill netters and purse seiners; conversion of outrigger trawl for fishing upto 300 m depths.
- Demonstration and encouragement of monofilament longlining.
- Introduction of multi-day fishing boats with adequate cold storage facility; increased deployment of GPS and electronic communication devices and intensification of trolling operations
- Increased exploitation of long tail tuna (*T.tonggol*), *T. albacares* (young ones) and *A.rochei*.
- Improved post harvest processing, diverse value added fishery products from tuna coupled with marketing facilities.
- Intensive extension education for fishermen community in the capture, marketing and processing sectors.

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