STATUS REPORT ON THE TUNA FISHERY IN INDIA, WITH PARTICULAR REFERENCE TO LONGTAIL TUNA, *THUNNUS TONGGOL*

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INTRODUCTION

The status of the tuna fishery in India and the structure of the stock in inshore waters of the Indian EEZ have received attention in the recent past (James and Pillai, 1990; James, 1991; Pillai, 1991; Pillai, 1993; James *et al*., 1993a, b; James and Pillai, 1993a, b). This paper provides a brief update of the current status of the tuna fishery in India, with particular reference to longtail tuna (*Thunnus tonggol).*

Tuna-fishing in Indian waters is carried out by (i) small-scale motorised/mechanised/unmechanised craft up to a depth of 10 to 80 m along the coastline of the mainland of India, (ii) artisanal pole-and-line and troll-line operations in the vicinity of the oceanic islands of Lakshadweep, and (iii) oceanic exploratory survey/training vessels and commercial longline vessels fishing in the Indian EEZ under joint-venture schemes.

TRENDS IN TUNA PRODUCTION

The average annual production of tunas during 1985-1994 was 38,286 t. The production reached 51,846 t in 1990 and declined to 36,846 t in 1994 (Figure1). A spurt in average annual production is evident, from 25,087 t in 1982-86 to 36,840 t in 1985-94. The west coast of India contributed about 70%, the east coast 14.5%, Lakshadweep 14.5%, and the Andaman and Nicobar Islands 1% of the total catches of tunas and billfishes.

CRAFT AND GEAR

Both mechanised and unmechanised craft are engaged in the exploitation of tunas in the mainland, and operate multi-species gears such as drift gillnets, purse seines, trolls, hooks and lines and troll lines. Motorisation of country craft, begun in the early 1980s, has enabled the fishermen to venture into distant areas, and this is reflected in the trends in tuna production, especially for *Auxis rochei* and *T. tonggol*. In Lakshadweep, mechanised boats are employed for pole-and-line fishing and for surface trolling.

SPECIES COMPOSITION

In 1992-94 little tuna (*Euthynnus affinis*) dominated the catch in the inshore fishery, with 45.5% of the total, followed by *Auxis* spp. (12.9%), skipjack tuna, (*Katsuwonus pelamis)* (9.5%), and *T. tonggol* (7%); the rest (25.1%) is other species.

Longtail tuna

During the 1985-1994 period the total landings of longtail tuna fluctuated between 246 t in l986 and 3955 t in 1994, with an annual average of 1884 t, or 4.92% of the total production of tunas (Table 1). It can be seen from the table that landings of longtail tuna have increased in recent years, and contributed about 10.7% of the total tuna landings during

Figure 1. T. tonggol *contribution in all India total tuna catch (1985-1994).*

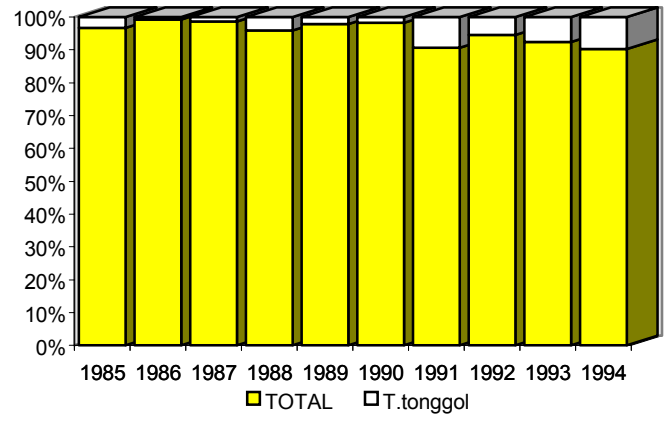


Table 1. **All India tuna landings, in tonnes, and the percentage contribution of longtail tuna, 1985-1994**.

Year	*Total catch*	*Longtail tuna*	*% of longtail*
1985	31,261	1,087	3.48
1986	33,775	246	0.73
1987	30,111	444	1.47
1988	30,366	1,299	4.28
1989	45,208	981	2.18
1990	51,846	951	1.83
1991	36,248	3,727	10.28
1992	43,272	2,487	0.75
1993	43,929	3,657	8.32
1994	36,846	3,955	10.73
Average	38,286	1,884	4.92

1994. This increase in the longtail tuna catch has been attributed mainly to the mechanisation and motorisation of country craft, extending the area of operations beyond the traditional fishing grounds, and to the introduction of innovative gears. Of the four regions, the north-west region contributed the greatest longtail tuna catch.

Size composition of *(Thunnus tonggol)*

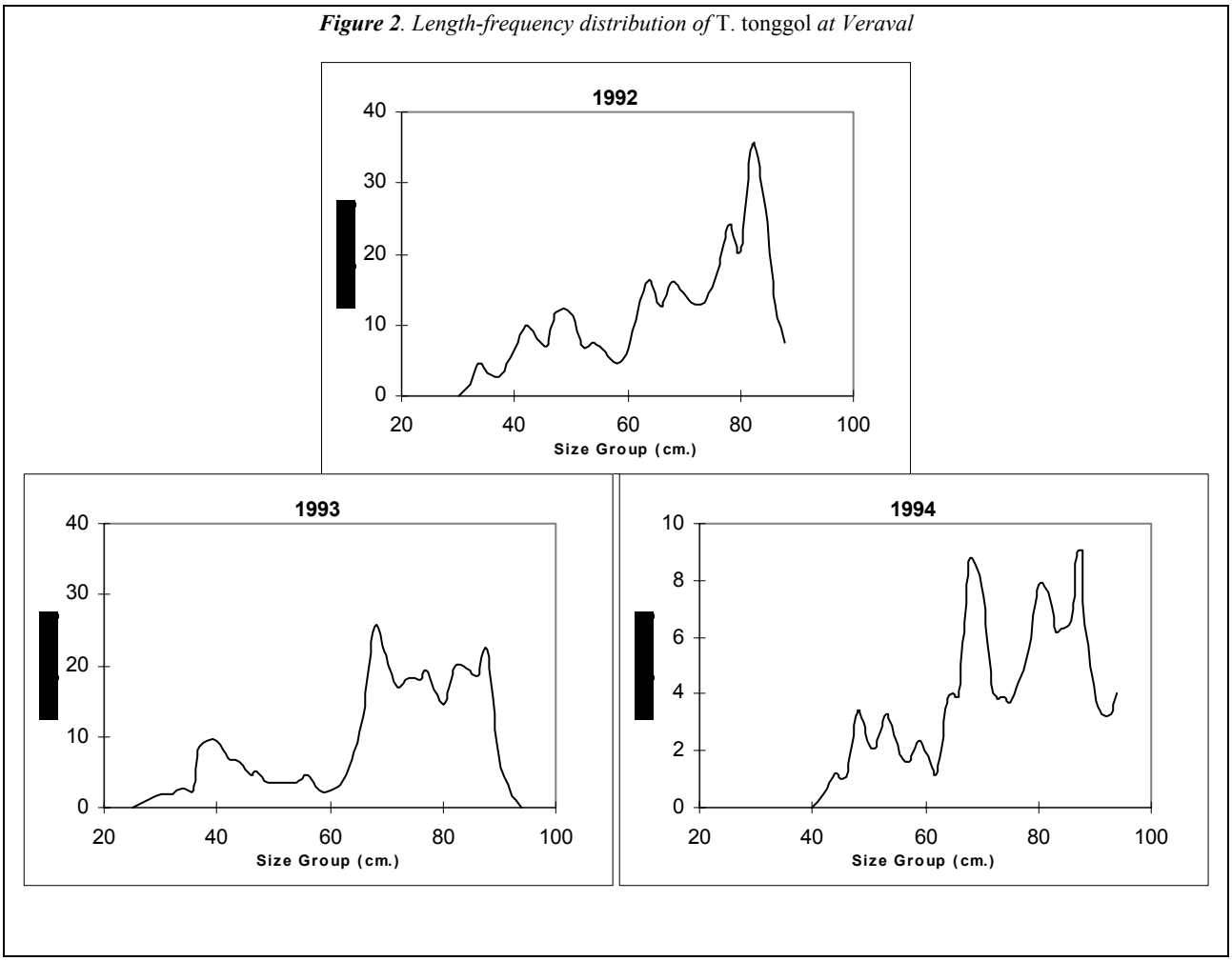
Figure 2 shows the annual size distribution of *T. tonggol* from the Veraval fishery along the Northwest region, where the species occurred in the size range of 32-88 cm in 1992, 28-92 cm in 1993, and 42-94 cm in 1994. The three predominant size groups in the fishery occurred at 45-50 cm, 70-75 cm, and 85-90 cm.

Stock assessment of *T. tonggol,* based on data from 1989-1991, has been attempted previously (James *et al*., 1993). The estimates of the length-weight relationship parameters for *T. tonggol* were:

q in $W = qL^b$ (gm, cm)=0.000083
b in $W = qL^b$ (gm, cm)= 2.7046

The estimates of growth parameters used for the analysis were: L_∞= 94.0 cm and K = 0.48. The length-converted catch curve gave an estimate of Z of 1.22 The length cohort analysis with the above estimates of L_∞ and K and an estimate of M = 0.803, gave an estimate of mean F (L≥44) of 0.35 and a terminal exploitation rate of 0.29. The average annual catch during the 1989-1991 period was 1951 t. The Thompson and Bell long-term forecast model

Figure 2. *Length-frequency distribution of* T. tonggol *at Veraval*



gave an estimate of MSY of 3096 t, which can be attained at an level of effort 4.7 times higher than that of the 1989-91 period. It was also inferred that by simply doubling the effort, an increase in yield of 737 t can be expected. The biomass MSY estimated by this method was 2683 t, and the average biomass during the 1989-1991 period was 7965 t. However, the estimated average catch during 1992-1994 was 3366 t.

CONCLUSIONS

The tuna resources presently exploited in India are comprised of the small tunas, such as *E. affinis*, *A. thazard, A. rochei,* and *T. tonggol,* in the coastal sector, and *K. pelamis*, *T. albacares* and *T. obesus* in the oceanic waters. It could be observed from the recent trend in the exploitation of tunas that with the mechanisation and/or motorisation of the traditional craft, introduction of more efficient gears, and improvement of infrastructure facilities, an increase in population is evident. The medium-sized *T. tonggol* caught off the southeast and southwest coasts of India and the large *T. tonggol* and *T. albacares* taken from the northwest coast offer considerable scope for the expansion of the fishery for these species. Suggested options for augmenting production from the inshore areas of the mainland and the ecosystems around islands in the Indian EEZ were diversification of craft and gears, expansion of the operational efficiency of the vessels by mechanisation to cover the continental shelf area to intensify exploitation of tuna resources, especially *T. tonggol*, *T. albacares*, and *A. rochei*, and extending the operations of existing purse seiners, presently concentrated in nearshore waters, to offshore waters. Furthermore, large-scale deployment of fish-aggregating devices and/or artificial reefs, introduction of multi-day fishing, intensification of trolling operations and economic utilization of live bait in pole-and-line tuna-fishing operations would enhance the production of tunas from Indian waters.

T. tonggol is in high demand in the export market to Far Eastern countries in fresh/frozen and chilled form. It is suggested that expanding the area of fishing and modification and multi-day operation of drift gillnetters would considerably enhance the production of both longtail tuna and yellowfin tuna.

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