CURRENT STATUS OF FISHERIES FOR TUNAS AND TUNA-LIKE FISHES IN INDIA

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INTRODUCTION

The Indian tuna fishery comprises two distinct segments, the coastal fishery and the oceanic fishery. While the drift gilinet fishery and hooks & line fishery around the mainland india, in which different species of tunas and tuna-like species occur, and the pole-and-line and troll line fisheries exploiting skipjack and young yellowfin tuna around Lakshadweep islands are the main components of the coastal tuna fishery, the oceanic fishery is exclusively by Ion-glining where large deep-swimming yellowfin and bigeye tunas are the target resources. The status of coastal fishery was reviewed last by Pillai et al. (1995) and that of oceanic fishery by Somvanshi and John *(1995).* The present paper gives an update of the national tuna fishery, both the coastal and oceanic segments, and its trends in recent years. All the three groups of scombroid resources, viz., tunas, billfishes and seer fishes are covered in this review.

COASTAL FISHERY

In the mainland of India tuna fishing is carried out by small scale mechanised and traditional crafts operating upto about 80m depth all along the coastline. The fishery is not targeted on tunas, and boats operate multispecies gear such as drift gillnets, purse-seines, hook and lines and troll lines. Motorisation of country craft, which gained momentum in the early eighties, enabled the traditional fishermen to venture into distant areas from the coast. In Lakshadweep, where a targeted tuna fishery exists, mechanised boats are employed for pole and line fishing, surface trolling and for hand lining.

The catch of tunas and tuna-like fishes during 1991 to 1997 ranged from 74,194 tonnes in 1991 to 95,988 tonnes in 1997 (Table 1). During the year 1997, the catch consisted of *50,668* tonnes of tunas (52.79%), 4,448 tonnes billfishes (4.63%) and 40,872 tonnes seer fishes (42.58%). The Fishing Areas 51 and *57,* essentially representing the west coast and east coast respectively, accounted for 70.8% and 29.2% of catch. The production trend of the three groups of resources in Areas 51 and 57 during 1991 to 1997 is given in Fig. 1.

Tunas

Tuna production during 1991 to 1997 ranged from 0.36 lakh tonnes in 1991 to 0.51 lakh tonnes in 1997 (Table 1). The present production of 50,668 tonnes in 1997 is the highest catch ever recorded. 80. 1 % of the catch was landed in the Fishing Area 51. The State of Kerala was the major contributor *(34.5%)* followed by Gujarat (20.1 %), Lakshadweep (14.4%) and the rest by other states.

Among the tunas, **Euthynnus affinis** constituted the major species forming 46.2% of the total tuna catch followed by **Auxis spp.** (20.8 %), **Katsuwonus pelamis** (12.0%), **Thunnus tonggol** *(10.5%),* **Thunnus albacares** (7.8%) and **Sarda orientalis** (2.7%). In the pole and line fishery at Minicoy, **K. pelamis** constituted 89.1% and **T. albacares** 10.9%. In the hand lines operated at Minicoy, **T. albacares** constituted 91.7%. At Agatti, **K. pelamis** constituted 97.6% of the total tunas caught followed by **A. thazard** (1.8%), T. albacares (0.4%) and **E. affinis** (0.2%).

The size range of **E. affinis** in the fishery was 24-60 cm, with fishery supporting group in the 38-64 cm size range; that of **A. thazard** 22-54 cm with modes in the 32-42 cm size groups; that of **K. pelamis** 24-68 cm with modes in 42-64 cm size groups;that of **T.albacares** 28-90 cm with modes at 42-86 cm size group; that of **S. orientalis** 36-54 cm with modes at 43-48 cm size group and that of **A. rochei** 22-34 cm with modes in the 24-28 cm size group.

Bill fishes

During 1991-1997 the landing of bilifishes, mainly by drift gillnets, has gone up from 791 tonnes to 4448 tonnes. **Istiophorus platypterus, Makaira indica** and **Xiphias gladius** were the major species of billfishes occurring in the fishery.

Seer fishes

The landing of seer fishes during 1991 to 1997 ranged from 0.37 lakh tonnes to 0.47 lakh tonnes. In 1997, the catch was 40,872 tonnes of which 61.9% was reported from the Fishing Area 51 and the remaining 38.1 % from the Area *57.*

State-wise, Gujarat situated along the north-west coast recorded the highest share (29%) followed by Tamil Nadu (18%) and Andhra Pradesh (11.5%) in the south-east coast. Drift gillnet was the major gear contributing 56. 1 % to the

total seerfish catch followed by bottom trawl (3 1.9%), hook and lines (9.9%), purse seine *(1.5%)* and other gears (0.6%).

Among the four species occurring in the fishery, viz., the king seer **Scomberomorus commerson**, the spotted seer **S. guttatus**, the streaked seer **S. lineolatus** and the wahoo **Acanthocybium solandri**, the first two species are commercially important contributing *59.9%* and 39.4% respectively to the total seer fish catch. **S. guttatus** constitutes the main species being fished from the northern coasts.

The size range of **S. cominerson** was 22-134 cm in the large mesh drift gillnet, 14-72 cm in the small mesh gillnet **(podivaIai)** at Tuticorin, 12-108 cm in bottom trawl and 48-128 cm in hook and line. The fishery was mainly supported by 34-112, 14-58, 12-100 and 48-128 cm size groups respectively. The length of **S. guttatus** ranged from 20 to 68 cm in gillnet and 18-58 cm in trawl.

OCEANIC FISHERY

The oceanic tuna fishery is exclusively by longlining. Under the Maritime Zones of India (Regulation of Fishing by Foreign Vessels) Act, 1981, and the Rules (1982) made thereunder, the Government of India had permitted the charter of foreign vessels for fishing in the Indian EEZ. Under the scheme tuna longline vessels operated in Indian waters from 1985 to 1995.

Tuna vessels also operated under two other schemes introduced in 1991, viz., (1) leasing of foreign fishing vessels by Indian entrepreneurs for operation in the Indian EEZ and (2) joint ventures between Indian and foreigmi companies in fishing, processing, and marketing.

As the charter scheme was originally envisaged as a prelude to joint venture and Indian ownership enterprises, and having fulfilled to a large extent the objectives of chartering, the government decided in 1992 to gradually phase out the charter scheme in favour of joint ventures and Indian-owned vessels.

Charter Fishing

Introduced in *1985,* fishing under the charter scheme witnessed phenomenal growth in the subsequent years. The activity was at its peak in the year 1990 when *58* foreign longline vessels were in operation in Indian waters. Results of fishing under this scheme have been published by the Fishery Survey of India from time to time.

Effort, Catch and CPUE:

☒ chartered fishing fleet consisted mostly vessels of Thaiwanese origin flying the flags of Panama or Honduras. The vessels were of 42 to 6Omn OAL, with GRT ranging from 364 to 825. The number of vessels operated, voyage days and fishing effort during the years 1985-1995 are given in Table 2. The highest effort of 19.8 million hooks was operated in the year 1990. As indicated earlier, due to a shift in the policy with regard to the issue of licences, the number of vessels came down and the activity was closed by the year 1995. The species-wise catch details are given in Table 3. The average annual catch in 1991-1995 was about 3914 tonnes consisting of yellowfin tuna (69.1 %), bigeye tuna (3.8%), billfishes (19.0%), and other fishes mainly sharks (8. 1 %). The mean catch per fishing day during the period was 1.9 tonnes of which the yellowfin tuna component was 1.2 tonnes.

Fishing Areas and Seasons:

The highest concentration of fishing effort (48. 1 %) was off the north-west coast, followed by Andaman & Nicobar waters and the east coast. The vessels followed a clear operational strategy in the selection of fishing grounds with respect to different regions and months Along the north-west coast, fishing activity starts by April and increases progressively upto September. By October the vessels start moving southwards and from November the main fishing activity shifts to the Bay of Bengal. By April, vessels start moving back to the west coast, and from May fishing occurs exclusively off that coast. The pattern of effort distribution by 50 squares is shown in Fig. 2.

Fishing by Indian Ownership, Joint Venture and Leased Vessels

Making use of the liberal policy initiatives and institutional financing, the Indian fishing industry had taken up tuna fishing in the early nineties. Apart from one industrial longliner that was in operation since 1986, five longliners of 42 to 55m OAL were added to the fleet in 1992-1993. Due to operational constraints and economic reasons these five vessels discontinued operations by 1994-95. Fresh joint venture arrangements and leasing of vessels came ~:~rce• from 1996 and as in 1998 five foreign tuna longliners are in operation under these schemes. The declared catch of these vessels in the current year indicates a CPUE of 2 tonnes per fishing day, consisting of yellowfin tuna *(55.5%)*, bigeye tuna (1.0%), skipjack (1.9%) sword fish (18.1 %), marlin *(15.0%)*, sail fish (3.9%) and sharks (4.6%). Specieswise catch statistics of these categories of vessels is given in Table 4.

Catches by Government of India Survey/Training Vessels

Catches made by survey and training vessels of the Government of India also formed an important component of the longline catch from Indian waters. The details for the period from 1983 to 1997 are given in Table 5.

Overall Production from Oceanic Fishery

The total longline catches from Indian waters during 1983-1997 by different categories of vessels are shown in Table 6. The highest annual catch was 12713 tonnes reported in the year 1990.

Data Collection and Biological Research

The Central Marine Fisheries Research Institute (CMFRI) continue to collect landing statistics from the coastal fishery on an all India basis. The statistics are collected on statewise, specieswise and gearwise basis following a well defined Multistage Stratified Random Sampling Design. The Fishery Survey of India (FSI) is engaged in exploratory survey of oceanic tuna resources in the Indian EEZ. Extensive surveys in different regions of the EEZ have generated data on availability and distribution of the larger pelagic stocks. Besides, the FSI has been collecting, processing and disseminating information regarding operational aspects and catch details of the foreign fishing vessels operated under the charter scheme. This data provided comprehensive information on commercial fishing by tuna longline by the foreign fishing vessels.

Biological research on different tuna and seer fish species in the coastal fishery are undertaken by the CMFRI from different centres (10) all along the mainland and in Lakshadweep. The FSI is engaged in study on biological aspects of large oceanic tunas and bill fishes occurring in longline gear from the north-west coast of India and the Andaman & Nicobar waters. Several studies have been published and further research is in progress enabling to provide necessary R&D support to the fishery for tunas, billfishes and seer fish in Indian waters.

REFERENCES

Pillai, N.G.K., P.P.Pillai and K.P.Said Koya. 1996. Status report on the tuna fishery in India, with particular reference to long tail tuna **Thunnus tonggol**. In: Anganuzzi, A.A., K.A. Stobberup, N.J. Webb (eds.) 1996. **Proceedings of the Expert Consultation on Indian Ocean Tuna,** 6th Session, Colombo, Sri Lanka, 25-29 September, 1995: 6-8.

Somvanshi, V.S. amid M.E. John, 1996. Oceanic tuna fishery in India - An update. **Ibid**: 1-5.

Table 1. Estimated landings of tunas, billfishes and seer fishes in the coastal fishery in India: 1991-97

Estimated landings (tonnes)

Species	1991	1992	1993	1994	l995	1996	1997
Tunas							
K.pe1amis	4645	4859	4988	9254	6577	6844	6090
T.tongqol	3727	2487	4324	4953	7036	4263	5322
E.affinis	17624	23391	19197	15705	18781	14778	23425
Auxis spp.	5407	7895	3976	12463	5917	11119	10564
Tunas NEI	4523	8666	7698	3162	5087	9535	5267
Total	**35926**	**47298**	**40183**	**45537**	**43398**	**46539**	**50668**
Bilifishes	791	1504	1810	1722	1388	3889	4448
Seer fishes							
S.commerson	16794	24578	20019	24624	28587	24613	23360
S.guttatus	20039	17494	21630	16355	17174	12662	13255
S.lineolatus	46	1027	79	46	87	96	901
Acanthocybium	sp. 529	10	1	-	5	23	21
Seer fishes NEI	69	69	69	936	851	1216	3335
Total	**37477**	**43178**	**41798**	**41961**	**46704**	**38610**	**40872**
G.Total	**74194**	**91980**	**83791**	**89220**	**91490**	**89038**	**95988**

Table 2. Fishing effort of chartered tuna longline vessels operated in Indian waters, 1985-1995

Year	Number of vessels operated	Number of voyages	Voyage days	Sets made opereated	Hooks (million)
1985	1	1	29	26	0.04
1986	10	15	1062	768	1.54
1987	5	9	647	513	1.23
1988	8	13	840	655	1.57
1989	30	39	3281	2237	6.26
1990	58	81	9187	6608	19.82
1991	22	26	2869	2224	7.18
1992	23	29	3282	2474	7.92
1993	28	37	2049	1636	5.24
1994	17	17	1394	1213	3.88
1995	18	24	2452	2137	6.84

Table 3. Catches by chartered tuna longline vessels operated in Indian waters, 1985-1995 (unit: MT)

Year	Yellowfin	Bigeye	Billfishes	Other	Total
1985	-	3	2	2	7
1986	839	86	169	809	1903
1987	473	66	263	104	906
1988	627	11	216	93	947
1989	2891	56	609	434	3986
1990	10352	256	1478	485	12571
1991	3784	343	705	366	5198
1992	4349	139	655	528	5671
1993	2071	62	461	174	2768
1994	1344	164	866	205	2579
1995	1975	40	1021	317	3353

Table 4. Catch statistics of Indian-owned/joint-venture! leased tuna longline vessels operated in Indian waters, 1986-1997 (unit : MT)

Year	Yellowfin	Bigeye	Billfishes	Others	Total
1986	229	-	32	232	493
1987	1.42	-	23	125	290
1988	99	-	11	116	226
1989	19	-	9	31	59
1990	4	-	7	62	73
1991	35	-	13	107	155
1992	11	-	14	84	109
1993	219	866	43	150	1278
1994	169	1076	150	85	1480
1995(P)	169	1076	150	85	1480
1996(P)	162	-	100	53	315
1997(P	136	-	141	42	319
1998(P)*	1018	18	678	114	1828

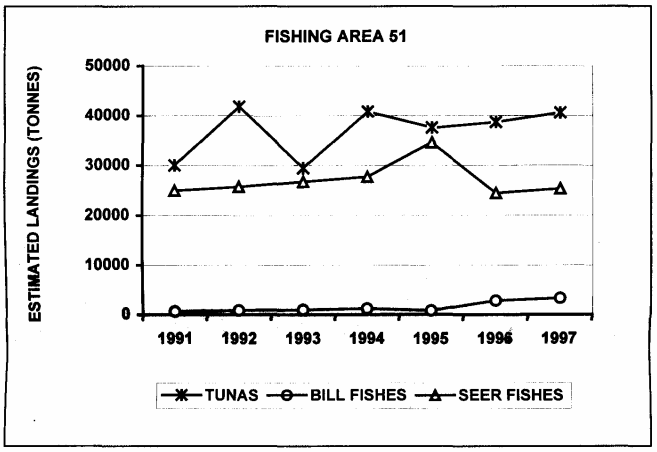
* Data upto September, 1998

Table 5. Catch statistics of Government of India survey/training vessels operated in Indian waters, 1983-1997
(unit : MT)

Year	Yellowfin	Bigeye	Billfish	Others	Total	
1983	14.0	1.5	10.8		33.8	60.1
1984	41.6	1.7	23.9		34.3	101.5
1985	114 9	0 9	18 9		47 2	183 9
1986	415.8	1.2	35.4		52.9	505.3
1987	97.7	0.7	25.3		59.3	181.0
1988	33.8	0.1	23.2		42.9	100.0
1989	11.7	0.1	12.5		20.7	45.0
l990	13.0	0.2	13.1		42.8	69.1
1991	14.2	-	5.3		9.2	28.7
1992	29.0	0.4	9.9		68.5	107.8
l993	8.5	0.2	5.7		56.4	70.8
1994	15.6	0.1	4.7		30.0	50.4
1995	25.4	-	4.9		25.5	55.8
1996	9.7	-	3.2		15.2	28.1
1997	18.0	-	7.4		16.5	41.9

Table 6. Overall tuna production from Oceanic fishery in Indian waters: 1983-1997 (unit : MT)

Year	Yellowfin	Bigeye	Billfish	Others	Total
1983	14	2	11	33	60
1984	42	2	24	34	102
1985	118	1	21	49	189
1986	1484	87	236	1094	2901
1987	713	67	311	288	1373
1988	760	11	250	252	1273
1989	2922	56	631	486	4095
l990	10369	256	1498	590	12713
1991	3833	343	723	482	5381
1992	4389	139	679	680	5887
l993	2299	928	510	380	4117
1994	1529	1240	1021	320	4010
1995	2169	1116	1176	428	4889
1996	172	-	103	68	343
1997	154	-	148	59	361



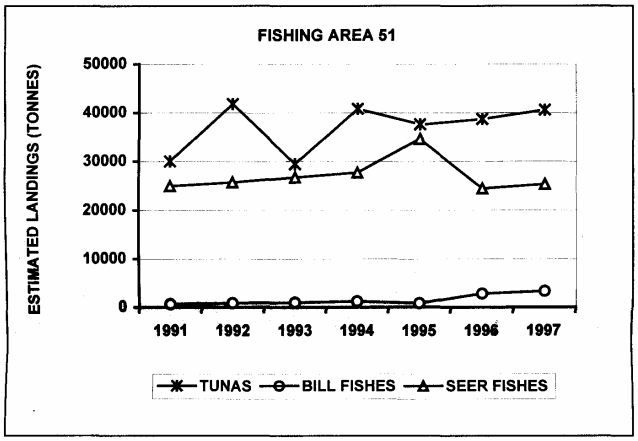


Fig. 1 Production (in Fishing Area 51 and 57) of tunas, bill fishes and seerfishes in the coastal fishery in India, 1991-97

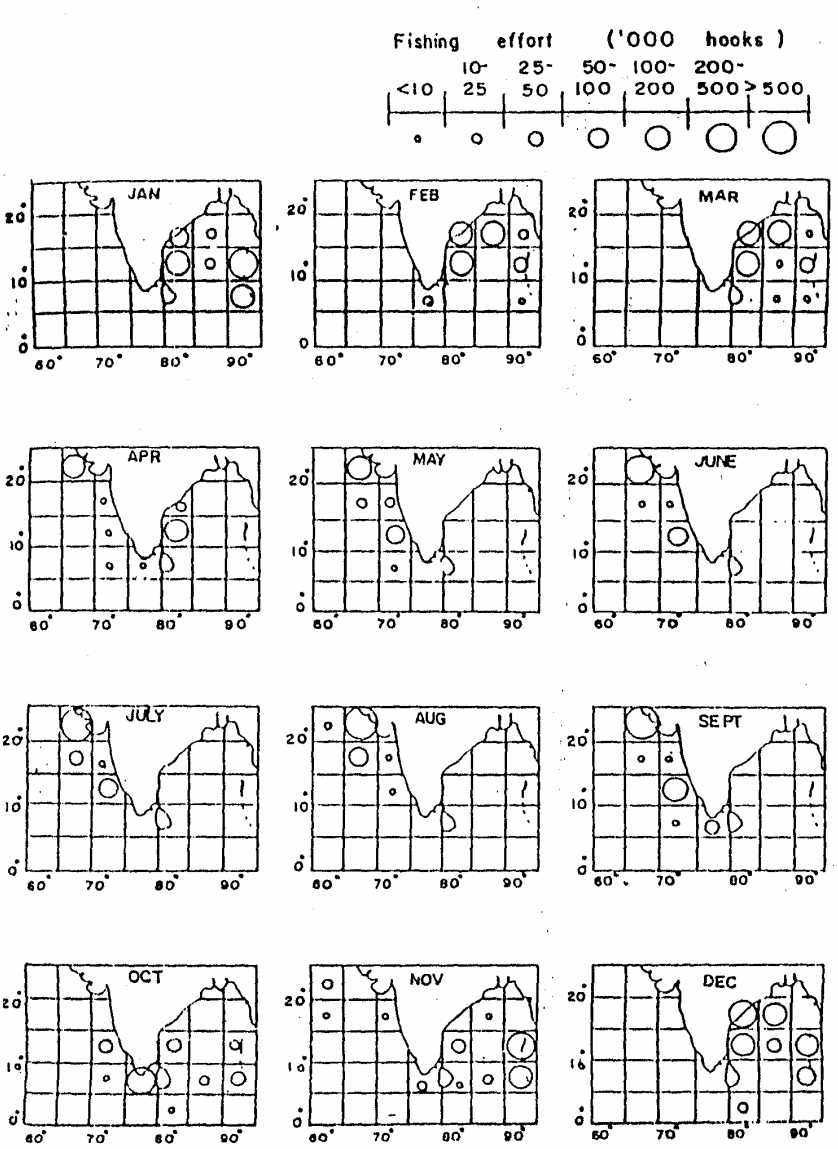


Fig. 2. MONTHLY DISTRIBUTION PATERN OF FISHING EFFORT BY CHARTERED VESSELS (Source: John. 1995)