DEVELOPING AN OCEANIC TUNA FISHERY IN INDIAN EEZ

by

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India having the previlege of 2.02 million sq. km. of waters as her EEZ, has been concentrating her fishing efforts mainly in the coastal / inshore belts. With an estimated resources potential of 4.5 million tonnes in the EEZ we have been able to exploit only about one third of this stock. A number of studies and research have been made on the fishery resources of the continental shelf by different organisations. Considerable effort on diversification of fishing gear and methods and craft for augmenting production from this area has also been made in the recent past. In spite of all these efforts the marine fish production of India had been more or less stagnant during the past few years. Efforts has to be extended into the distant and deeper waters to exploit the major oceanic fishery resources economically so as to break the ice and register any perceivable increase in our marine fish production.

The size of exploitable resources of tunas and bill fishes is estimated to be 2,40,000 tonnes in the Indian EEZ of which only skipjack, little tunnies and meagre quantities of yellowfin tuna are at present exploited around the archepelagos and within the coastal belt. The substantial stock of oceanic tuna and bill fishes is not being exploited at all in a commercial level. There are many reasons attributed to this: Inadequate knowledge of the viable fishing grounds, lack of technical know-how to exploit these valuable resources economically and paucity of suitable vessels are the most important ones. Considering these factors the Govt. of India during 1980 obtained two 250 ton class combination fishing vessels-primarily rigged for tuna long - lining viz. MATSYA SUGUNDHI and PRASHIKSHANI with the main objectives of surveying the oceanic tuna resources of the EEZ and to build up trained man-power in the new fishing technique of long lining. Matsya Sugundhi is a tuna long liner-cum squid jigger and Prashikshani is a tuna-long liner-cum-stern trawler. Both these vessels are deployed for tuna-long line fishing in view of the top priority attached to exploitation of tuna.

Since their commissioning in 1980 Matsya Sugundhi operated by FSI concentrated on the survey of the oceanic resources while Prashikshani operated by CIFNET was deployed for imparting training in tuna long-lining.

A tuna long line fishing was unfamiliar to the Indian fisherman, considerable effort is

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needed in developing trained manpower. To achieve effective training of operatives, the services of Capt. E. Haruta, a tuna long line expert, was acquired from Japan under JICA and for a period of 18 months. This brought in a substantial improvement in the utilisation of the training vessel. In order to further emphasise the importance of developing this fishery, the Govt, of India also launched a Special Tuna Drive programme from October 1983 to March 1985.

Training activities were organised, a large area of the EEZ of India was surveyed and potential tuna grounds were located. There has also been immense improvment in the operation, handling of gear, post harvest techniques etc. The operation of the vessel clearly indicated that vast potential resources of oceanic tuna and bill fishes exist in the EEZ and the high hooklng rates obtained further supported that these resources can be commercially exploited. This paper highlights the results of the efforts made by the tuna long line training vessel M. V. Prashikshani of CIFNET since 1981.

The training which commenced in a humble manner in 1981 was well organised and strengthened during the tenure of the Japanese long line expert from Sept. 1983 to Feb. 1985. The expert participated in voyages of M. V. Prashikshani and Matsya Sugundhi in alternating manner. The voyages were of 20 days duration. While at shore the expert stationing at the Institute organisnd gear fabrication and mending. The training under the supervision of the expert focussed attention on the following points:

1. Removing inhibitions of the officers and crew of vessels in high sea navigation to distant grounds by proper and effective use of navigational aids.
2. Making meteorological and oceanographic observations pertaining to locating tuna grounds.
3. Proper rigging and maintenance of gear.
4. Post-harvest operations of handling of tuna, bill fishes and sharks on board.
5. Documentation

During the period from 1981 to 1985 the vessel conducted 55 voyages and operated 2,34,113 No. of hooks in 463 No. of sets made.

So far 13 Skippers and 15 Fishing Second-hands 50 Deckhands were trained on the deck side and 3 Chief Engineers, 16 Engine Drivers and 30 Engine Room Assistants were trained in the engine side. In addition to on the job tranining given as above, demonstration in longlining was given to Institutional trainees regulary. Thirteen Shore Officers went on board each for one to six voyages to study the different technical and scientific aspects of the new fishery.

Alongwith the training activities, information on the oceanic resources of our EEZ and adjoining waters was also collected by the vessel. The vessel operated her lines in the Arabian sea, Indian Ocean upto 6°S latitude, the Bay of Bengal and the Andaman Seas.

Of a total of 83 squares of 1° latitude by 1° longitude each surveyed, the oceanic waters between Lat 13°N and 15°N on the west coast yielded the highest hooking rate for all fishes at 7.6% followed by the area from 15°N to 8°N with 7.5%. On the east coast the waters off Tamil Nadu, Andhra Coast and western Andaman sea was found to yield a hooking rate of 2.1%. The international waters around equator upto 6°S latitude yielded 0.5%. Of the Tunas and bill fishes hooked, Yellow-fin tuna was the predominant species found occurring in all these grounds. Big eye tuna was recorded only in meagre quantities on western side of Lakshadweep in the Arabian sea, between 1°S and 6°S in Indian Ocean and from western Andaman sea. Bill fishes were found distributed almost evenly in all the areas surveyed. Pelagic sharks formed the major constituents in the catch in early years of operation, that is, during 1981-82, forming about 75% of the total catch, which slowly fell to 15-20% by 1985-86 as the long-lining skills of the team improved.

Of the few potential grounds for oceanic tuna and bill fishes located by M. V. Prashikshani the grounds off Karnataka-Konkan coasts between Lat.12°N and 15°N and Long. 71° E

and 73° E were found to be the most productive for yellow-fin tuna. The ground was located in oct. '85 and since then active fishing was done in this area to assess the feasibility of the fishery in the region. The fishing ground lay about 120 nautical miles due west off Honavar. The distance from Cochin, Mangalore and Goa to this ground was 445 n. m. 170 n. m. and 100 n. m. respectively. It may be mentioned that this ground which is strategically positioned close to the three major harbours with its potential resource can apparently support a strong base for establishing Indian oceanic tuna fishery. During the period from Oct. 85 to Jan. 86 the vessel was out at sea for 67 days and made 35 sets and operated 22090 number of hooks. The hooking rates observed from this area was the highest for the entire EEZ surveyed so far. The highest hooking rate per set recorded so far was 39% for all fish and 38.6% for yellow-fin tuna on 24-1-86 from area 14-72. The total catch landed during the period was 71.9 tonnes of fish of which 64.3 tonnes were good quality tuna. The yellow fin tuna weighed 38kg each on an average and measured 140cm in length.

The results have been highly encouraging with very high hooking rates. The results of operation from Oct.85 to Jan. 86 are furnished in Table-1.

Table-1 OPERATIONAL DETAILS OF M. V. PRASHIKSHANI FOR THE PERIOD FROM OCT. 85 to JAN. 86

Month	Area	Days out at sea	Fishing days	No. of hooks operated	Catch Numbers (Hooking rate %) Tuna	Skip-jack	Bill fishes	Shark	Oth-ers	Total
Oct. 85	12-72, 12-73	16	11	8125	365 (4.4)	—	15 (0.2)	67 (0.8)	—	447 (5.4)
Nov. 85	13-72, 14-71 15-71, 14-72	17	8	5600	607 (10.8)	—	13 (0.2)	88 (1.6)	8 (0.1)	716 (12.8)
Dec. 85	14-71, 14-72 15-71, 15-72	17	8	5600	851 (15.2)	1 (0.02)	42 (0.7)	41 (0.7)	5 (0.1)	940 (16.8)
Jan. 86	13-72, 14-72	17	8	2765	694 (24.9)	6 (0.2)	5 (0.2)	8 (0.3)	2 (0.1)	715 (25.6)
Total	12-72 12-73 13-72, 14-71 14-72, 15-71 15-72	67	35	22090	2517 (11.3)	7 (0.3)	75 (0.3)	204 (0.9)	15 (0.06)	2818 (12.7)

A comparison of catch and effort data of Prashikshani from Karnataka grounds with the Japanese long liners operated in the AFZ off Tasmania during May-Aug 1984 is furnished in Table-2. It can be seen that the Japanese tuna long liners obtained a maximum catch rate of 378kg/1000 hooks of Blue fin tuna whereas Prashikshani recorded a maximum catch of 7529kg/1000 hooks. The average landings per vessel in Tasmanian AFZ works out to 25 tonnes per vessel for the four month period against 72 tonnes of catch landed by Prashikshani during the four months period. This clearly shows that the stock of tuna in our waters is in commercial size and our expertise in operation is also of commendable standards.

The present results obtained off Karnataka-Konkan coast indicate a very bright possibility of venturing into commercial exploitation of oceanic tuna in the area. It is to be emphasized that similar stock could be certainly located within our EEZ in other regions also as the survey progresses.

The CIFNET proposes to intensify its training efforts in long lining by organising a training programme for the officers of commercial vessels who are intending to venture into the field. Also a training scheme in tuna long lining for the Lakshadweep fishermen, who are probably the only tuna fishing population of the country, is envisaged aimed at building up trained manpower for the future industry.

Table-2 COMPARISON OF CATCH AND EFFORT DATA OF M. V. PRASHIKSHANI WITH THAT OF COMMERCIAL JAPANESE LONG LINERS

Fleet	Month	Total catch (tonnes)	Tuna catch (tonnes)		Tuna numbers		Effort (hooks x 100)	Total catch rate (kg /1000 hooks)	Tuna catch rate (numbers/ 1000 hooks)	
			Blue fin	Yellow fin	Blue fin	Yellow fin			Blue fin	Yellow fin
Data of Japanese long liners (21 vessels in the AFZ off Tansmania May-Aug. 84 6 days fishing	May 84	11.5	11.1	—	89	—	450	256	2.0	—
	June	195.5	179.3	—	2631	—	5200	378	5.1	—
	July	281.1	268.2	—	4123	—	9500	296	4.3	—
	Aug.	37.3	37.3	—	572	—	1320	282	4.3	—
Data of M. V. Prashikshani Tuna long liner of CIFNET in the EEZ off West Coast (Karnataka Coast) Oct. 85 to Jan. 86 35 days fishing	Oct. 85	12.2	—	9.8	—	365	81	1211	—	44.9
	Nov.	17.5	—	14.9	—	607	56	2657	—	108 4
	Dec.	20.9	—	18.8	—	851	57	3322	—	150.6
	Jan. 86	21.3	—	20.8	—	694	28	7529	—	250.9

There are much work to be done in developing a fishery for oceanic tuna in our EEZ such as :

1. To intensify survey efforts to gather as much details as possible on the distribution and seasonal abundance of tuna and bill fishes.
2. To collect good deal of information on the oceanography, meteorology and biology of tuna stock of our EEZ.
3. To take necessary steps to develop and produce quality long line gear materials locally.
4. To set up proper infrastructure at selected centres, adequate storage facility at -40°C for handling huge supplies of tuna and to take care of its processing and utilisation.
5. To create an awareness of the new fishery product in the internal market by market promotion activities.
6. To ensure an export market for the products.
7. To attract investment in this sector by resorting to necessary steps such as funding, chartering and joint ventures.

However, it can be safely said that we are much more informed of the oceanic tuna resources than earlier, and are in possession of enough expertise in its harvest and post harvest technologies and the time is ripe for giving a start to this fishery.