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TRAWL FISHING IN INDIA

by

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ABSTRACT

Attempts at offshore fishing by trawlers since 1900 and the results obtained are described. In the first half of this century some useful information on the trawling grounds was gathered but all efforts at commercial offshore fishing operations failed. Since about 1950 remarkable progress in offshore fishing operations has been made. The regional abundance of fish catches and the extent of trawling operations conducted at present from different bases is discussed. The non-availability of sufficient numbers of seaworthy fishing vessels has hampered intensive exploratory and commercial fishing operations in recent years.

Fishing in deep waters of the continental shelf along the Indian Coasts was unknown prior to 1900, in which year a British steam trawler "Premier" operated for the first time off Bombay coast a beam trawl. However, information regarding the areas fished and the catch particulars of this vessel are not available. Another British steam trawler "Golden Crown" in 1908-1911 fished the depths of the northern reaches of the Bay of Bengal at 10 to 100 fathoms and indicated the possibilities of commercial trawling in the region. About the same period (1902-1914) S.T. "Violet" of a private company for commercial trawling fished off Ceylon and in the adjacent waters. The operations of this vessel and two other vessels viz. S.T. "Lilla" (1920-23), and S.T. "Nautilus" (1924-30) had failed to demonstrate fully the possibilities for trawling in the region for successful commercial exploitation. However "Violet's" operations revealed two fishing banks, one off Tanjore coast and the other off Cape Comorin, the latter having been reported to be similar to the well-known Dogger Bank of Europe. "Lilla" also found two rich trawling grounds the 'Pedro Bank' to the north east of Ceylon across the Palk strait extending upto Nagapattinam coast and the 'Wadge Bank' of Cape Comorin Coast. (John et al 1959).

The British steam trawler, 'William Carrick' which fished during 1921-22 off Bombay and Saurashtra waters had furnished some valuable information regarding the type of gear used, the relative abundance of fish caught from different regions, the composition of the catches and some aspects of the biology of the component species (Hefford 1949). About 1923 S.T. "Madras" was also otter trawling off Bombay waters, but the results of the operations remained unpublished. Surveys of the deep sea fishing grounds in the Madras State were carried out by S.T. "Lady Goschen" (1927-30), S.S. "Margarita", "Southerland"

(sailing vessel), M.V. "Turbinella" and the "Sea Scout" (a motor launch) with some success, but most of these vessels were mainly utilized for conducting inspections of and harvesting the pearl and Chank fisheries in the South eastern coast of India. Some of the governmental and commercial vessels of Ceylon, viz. "Bulbul" (1928), "Tong-Kol" (1928-29), "Raglan Castle" (1945-47) and "Aringa" (1947) were fishing on the "Wedge Bank" off the south western coast of India without much success (John, 1959). The results of the vessels "Kanyakumari", "Sagarkumari" and "Ashokkumari" of the West Coast fisheries Company Travancore and of the motor fishing vessel "Chandrika" of the Department of Marine Biology and Fisheries of the University of Travancore engaged in fishing operation (1949-50) around "Wedge Bank" were not encouraging (Gopinath, 1954). In general it may be stated that all attempts at deep sea or offshore fishing made in the first five decades of this century had not met with much success for the main reason that the yields were far too low to pay the enormous expenses involved in the maintenance of the vessels and their crew. Absence of any knowledge of the fishing grounds, lack of berthing facilities at the ports, difficulties faced in transporting the catch from the fishing grounds in fresh condition for marketing, lack of adequate experience in operating the vessels and the gear by the crew accounted for the poor monetary returns in the initial attempts in trawl fishing in these waters.

Assessing the reasons for the failure of the earlier attempts at the offshore fishing operations, the Government of India had opened in 1946 at Bombay, the Deep Sea Fishing Station to provide the much needed information on the fishing grounds, to rectify the methods where defective, to provide auxiliary facilities which had been hitherto inadequate and to offer intensive training to Indian personnel in techniques of fishing using mechanised crafts and gear. In the period that followed i.e. during the last two decades, much useful information has been gathered by the ceaseless efforts in exploratory and commercial fishing by the Central and State Governments Deep Sea and Offshore Fishing Stations, by the Indo-Norwegian Project and the private fishing companies, operating from different bases with some of the vessels manned by expert Danish, Norwegian and Japanese crews. Notable among the cruises are those of the Japanese trawler, "Taiyo Maru 17", the Government of India vessels, "M.T. Ashok, M.T. Pratap and M.F.V. Jheer" and the New-India Fisheries Company's bull trawlers "Arnala" - "Paj" and "Satpathi" - "Piloton", all of which operated off Bombay-Saurashtra coasts; the Indo-Norwegian Projects large and medium fishing vessels and the research vessels, which surveyed the grounds off the south-western coasts and the West Bengal cutters viz., the "Kalyanis" I to V which did exploratory fishing in the northern regions of the Bay of Bengal.

During the Second and the Third Five Year Plan periods (1956-67) the Deep Sea Fishing Station of the Government of India expanded considerably the offshore exploratory fishing programmes and opened several bases at Veraval, Mangalore and Cochin on the west coast and at Tuticorin and Visakhapatnam on the east coast. Bases at Veraval and Mangalore had to be closed down towards the end of the Third Five Year Plan Period as a consequence of the scrapping of some of the vessels which became unfit for fishing due to prolonged use. The Indo-Norwegian Project brought to India from Norway in 1955-'56 large schooners and some medium sized boats to survey and examine the economic aspects, particularly prawn fishing in the south-western part of India. During 1963-'64 more vessels were brought by the Indo-Norwegian Project to include exploratory fishing for ground fish in depths upto 20 fathoms off Karwar, Cannanore and Mandapam.

There was a further addition to the INP fishing fleet towards the end of 1966 when three large and powerful vessels viz. "Velameen", "Tuna" and "Klaus-Sunnana" were brought from Norway for exploratory fishing especially in deeper waters beyond the 100 fathom limit. All these vessels have tried shrimp trawling, otter trawling, purse-seining, troll lining and hand lining. The research vessels 'Kalava' and 'Varuna' have been helping in the collection of oceanographic and fisheries data particularly in the west coast of India. The exploratory-cum-commercial fishing in the northern reaches of the Bay of Bengal by the Govt. of West Bengal started in 1950, ceased in 1963 and the vessels were transferred to the Deep Sea and Offshore Fisheries establishments of the Government of India.

Currently the Government of India trawlers are operating from Bombay, Cochin, Tuticorin and Visakhapatnam; Indo-Norwegian Project vessels are doing exploratory fishing from Cochin base and most of the State owned smaller trawlers are fishing in Gujarat, Maharashtra, Goa and Kerala. Some of the private companies in the fishing industry have also their own trawlers, based at Bombay, Cochin, and Visakhapatnam. Besides the large and medium trawlers, there are over 5000 mechanised boats fishing in different coastal waters using different types of gear.

In the fishing operations by the mechanised vessels, trawls viz. the otter trawls of different designs, the shrimp trawls and the bull trawls are the chief types of gear in operation. Other types of gear as gill nets, longlines and purse seines are used only to a very limited extent. Since the inshore fishing operations have reached a point beyond which further expansion is limited, the fishing industry looks forward to the exploitation of the demersal fisheries for stepping up production. At present the landings by the trawlers hardly exceed 1% of the total marine fish production in India.

With better opportunities for export trade, there has been increased exploitation of the shrimp resources for which more and more trawlers are being commissioned by the fishing industry than in the past.

The organisation which deals with the processing of the offshore fishing data is the Central Marine Fisheries Research Institute, Mandapam Camp with its outstation establishments at Bombay, Veraval, Karwar, Mangalore, Cochin, Tuticorin and Visakhapatnam and the results of the fishing operations are available in the occasional papers published in the Indian Journal of Fisheries and in the monthly, quarterly and annual scientific reports of the Institute issued from time to time. RAO (1957) has summarized the results of exploratory fishing operations in the Indian region, dealing with them under four major geographic divisions, viz. the North-Western Division, the South-Western Division, the South-Eastern Division and Central-North Eastern Division. The data on annual landings, effort, catch per hour returns and species composition with area-wise particulars of the Govt. of India fishing vessels operating from different bases in the past five years are being tabulated. Some of the outstanding results obtained in exploratory fishing on regional basis is given in the following account.

1. North Western Division - Ratnagiri to Kutch

This includes very intensively fished areas on the continental shelf between latitudes 16° to 24° N and between longitudes 66° - 73° E. Some of the northern areas have proved to be excellent trawling grounds for quality fishes as Pseudosciaena diacanthus, Polydactylus indicus and Otolithoides brunneus.

The results of operations of S.T. "William Carrick" for the period 1921-22 (Hefford 1949) have shown very low overall catch per hour returns (107 lbs), but they indicated to some extent the relative potentialities of the different grounds from south of Bombay to Kathiawar and Sind coasts. The catch returns were observed to be higher from the Gulf of Kutch and Kathiawar coast than from other regions. The Deep Sea Fishing Stations trawler "Meena" during the 18 month period of fishing in the waters from January 1948, also obtained rather a low average catch rate of 171.5 lbs. but this vessel had charted an area of 7,500 square miles and located certain productive areas viz. 11,18,19 and 2. The catch rates obtained were over 200 lbs. per trawling hour. The Danish trawlers "Ashok" and "Pratap" which replaced "Meena" in 1949 proved to be efficient in the charting of the grounds to the extent of over 17,000 square miles of Saurashtra coasts, but also in testing out the relative efficiency of different types of gear. Till 1953 these vessels used midget otter trawls with annual catch rates varying from 94.4 lbs. to 125.14 lbs. per hour of fishing. During 1953-55 they operated the Japanese method of trawling (bull trawling) and the average catch per vessel rose to 1562.4 lbs. per hour. Other vessels of the Deep Sea Fishing Station viz. "Bumili", "Champe" etc. joined the fishing fleet for exploratory fishing. The operations of all these vessels and the Japanese fishing vessel "Taiyo Maru No. 17" which started fishing in the same waters during 1951-55 proved beyond doubt the practicability of offshore fishing as a commercial proposition. "Taiyo Maru 17" fished in 1951-52, 939 tons of fish worth RS. 449,389. It was found that bull trawling by "Ashok and Pratap" yielded catch rates $2\frac{1}{2}$ times more than those of "Taiyo Maru 17" which was otter trawling in the same grounds in the same months.

Between 1956-63, the New India Fisheries Company with two pairs of trawlers, "Arnala"- "Paj" and "Satpathi"- "Piloton" fished intensively in the Western Division and landed a total of 26,304 tons of fish worth 1.6 crores (1966). They covered also the Kutch region the fishery potentialities of which were hitherto little known. The annual landings and the relative regional abundance of the total fish catches are shown in Fig 1. There is a marked south to northward increase in the quantities of fish caught. The relative abundance of the important fish groups in the six different regions viz., Dwarka, Porbunder, Veraval, Cambay and Bombay are given by the author in an earlier account (Rao, 1967). The areas 11, 18, 48, A, N, R, S and T have given more than 1500 kg/hr. but below 2000 kg/hr. of trawling for a pair of vessels in some months. The highest catch rate of 2914 kg/hr. was obtained from area 2 in Veraval region in January 1961. Since 1964 the vessels "Akashi Maru" 23 and Company have been fishing in these waters and obtaining similar good catches in the earlier operations by other vessels. Very recently these and a few smaller vessels of this company have taken to shrimp trawling and obtained excellent catches of prawns in the region between Vengurla and Dahbol.

From Bombay base during 1961-'67 very intensive trawling operations were carried out by the Government of India vessels also. The average annual landings for the seven years period were 391,568 kg of fish for an average fishing effort of 1896 hours at a catch rate of 206.5/kg/hr. During 1967-68 some of these vessels, "Kalyanis IV and V" fished off Goa (major area 15-73) for the first time and obtained catch rates of over 350 kg/hr. The productive areas revealed by the vessels in the period 1962-65 are shown in Fig 2. The extent of coverage given by the vessels and particulars of the catch composition in the division as a whole are also tabulated. From the point

of view of the occurrence of large sized quality fishes comparatively in greater abundance and in magnitude of total catch, this division is not surpassed by any of the other three divisions. The regional and seasonal abundance of the fish species and their depth distribution pattern have been very thoroughly studied (Jayaraman et al. 1956, Rao, 1966). An attempt has been made to determine the relative fishing efficiency of the vessels fishing in this region.

2. South Western Division (Karwar to Cochin).

Although the oil sardine, mackerel and prawn fisheries in the far southern regions are well known the general fisheries potential is not adequately understood. The Govt. of India opened an offshore fishing station at Cochin in 1957 and subsequently one at Mangalore for exploratory fishing. The Indo-Norwegian Project established fishing bases chiefly at Karwar, Cochin and Cannanore. A large number of private fishing companies have also established. Some details of the landings were given by the writer in an earlier account (Rao, 1967) and in Appendix I. The magnitude of the shrimp catches from the Cochin base is enormous. The catch data of the Govt. of India vessels, the INP vessels and some of the fishing companies' vessels show some decline in catch per hour returns in the region in recent years. It is worth noting that towards the end of 1967 the larger vessels of INP, viz. "Velameen", "Tuna" and "Klaus-Sunnana" were engaged in extensive deep water trawling off Cochin and obtained quantities of deep sea prawns, Parapandalus, Aristaeus, Heterocarpus, Metapenaeopsis, Hymenopenaeus and Penaeopsis.

3. South Eastern Division (Pondicherry, Tuticorin and Mandapam).

The Govt. of India vessels of the Offshore Fishing Station at Tuticorin base commenced fishing operations in 1959 and covered the grounds near Pondicherry (areas 11-79, 12-79, 12-80) and those near Tuticorin (areas 8-78, 8-79 and 7-79). The grounds suitable for trawling are not very extensive. In general the prawn yields are low in this region, but in recent years they have been good from the area 8-78, being 19,513 kg. at 27.07 kg/hr. forming 11.56% in total fish in 1966 and 9,884.5 at 6.94 kg/hr. forming 4.10% of the catch in 1967.

From Mandapam base the medium boats of the Indo-Norwegian Project covered grounds in the Palk Bay and the Gulf of Mannar with very high catch/hr returns of rather small fishes, which are mostly silver bellies (Rao 1967).

4. Central and North Eastern Division (Andhra, Orissa and West Bengal Coasts).

The Govt. of India vessels of the Offshore Fishing Station at Visakhapatnam since 1959 have covered a wide region in exploratory fishing on the shelf between the river mouths of Godavari and Mahanadi. Under the able guidance of the FAO Expert (Poliakov, 1961-62) the fishing gears have been tested and suitable new designs of trawls have been introduced. Investigation on regional abundance of fish catches have shown a south to northward increase.

The fishing vessels of the West Bengal Government did extensive fishing operations in the northern region of the Bay of Bengal during 1950-'62 and located some important fishing grounds in the Western Channel, Eastern Channel.

Sand Heads, near Baitarni River mouth, off Debi and Prachi rivers, near Back Pagoda, off Puri, Chilka Lake and Gopalapur.

CONCLUSION

There has been only a slight increase in the trawler landings in India in the recent past ten years. In 1956 the trawler catch was 3175 metric tons which formed 0.44% and this increased gradually to 9203 metric tons forming 1.1% of the total marine fish in 1965. The output by the Govt. of India trawlers is about 1,000 metric tons a year (Appendix 1). The demersal fish catch is thus only a minute fraction of the total marine fish landings and there is good scope for increasing its production. The exploratory fishing operations, so far carried on have furnished detailed information on regional and seasonal abundance of fish catches. At various fisheries training centres, technical personnel are intensively trained to operate powered fishing vessels, modernized fishing gear and other equipments. The berthing facilities in the harbours are better at present than in the past. The onshore cold-storage and other facilities to handle the catches are fairly adequate. However, the greatest drawback is the lack of suitable seaworthy fishing vessels in sufficient grounds and for exploration of the vast regions which have not been covered before.

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