

DIVERSIFIED FISHING TECHNIQUES*

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ABSTRACT

In India fishing activities, prior to independence were the prerogative of the traditional fishermen employing indigenous fishing craft and gear. Subsequently, mechanisation was initiated to improve the socio-economic condition of the fishermen and augment fish production by various developmental measures taken by the government through the Five Year Plans and foreign assistance leading to the introduction and establishment of modern methods of fishing like shrimp trawling and purse seining. Constant efforts were made to improve the gear and craft used in this sector. Entry of large number of vessels resulted in the reduction of catch per unit effort for prawns. New resources identified can be exploited by using diversified fishing technique developed in the country to increase the fish catch. These diversified fishing techniques are discussed and suggestions made for further improvement.

INTRODUCTION

FISHING was carried out from time immemorial as an hereditary avocation involving the whole household through generations with crude implements. The ignorance, illiteracy, penury and conservatism hindered improvement and progress. During the colonial rule, the function of the administration was only revenue collection with some developmental measures for revenue augmentation. When the country became independent, developmental planning was promoted and it was only from the Second Five Year Plan onwards that substantial fishery development activities were envisaged, and through successive plans significant strides have been made and the production has reached the present level of 1.8 million from 0.5 million tonnes.

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FISH PRODUCTION IN INDIA AND DEVELOPMENT

During the sixth Five Year Plan the growth rate of fish production was 3.1% per annum as against the almost stagnated growth during the previous plan. A growth rate of 3.5% is targeted for the seventh Plan. It has been planned to increase fish production to 2 million tonnes and export earnings to Rs. 700 crores as against the present Rs. 400 crores.

The programme of motorisation began with the introduction of mechanised craft primarily for gill netting, but as this period of introduction coincided with the striking of rich

prawn grounds along the southwest coast and development of export oriented industry based on shrimp. The need arose for adoption of these vessels for trawling for prawn. This resulted in the introduction of larger vessels with more power. The mechanised trawlers became totally oriented towards shrimp trawling and a saturated point has been reached abruptly in many areas all along the coast. Although the initial plan envisaged was modernisation of all the fishing activities with the gradual phasing out of the traditional crafts, now all types of crafts fish in the same narrow coastal belt. The estimated number of these type of crafts in the maritime States and Union territories are 1,83,345 traditional crafts; 15,292 motorised crafts and 22,906 mechanised crafts (Varghese, 1986). There are about 165 fishing vessels of more than 20 GRT making a total of 2,06,466 numbers.

Though the motorisation programme of traditional craft was first initiated by Indo-Norwegian Project and later by the Indo-Bulgarian Project, the fishermen has taken it up only recently and there are at present 6,934 crafts in Kerala out of the 15,292 crafts in the country.

FISHING ACTIVITIES

The estimated population of fisherfolk in the country is about 71 lakhs, out of which 14 lakhs are actively engaged in fishing in inland and marine sectors. About 5 lakhs fishermen operate 1.8 lakh traditional craft and contribute about 62.16% of the marine fish production and the share of mechanised vessel is 37.84%.

The above information is furnished to indicate the intensive fishing activity that is going on in the narrow coastal belt. The introduction of purse seiners, numbering about 250 in Karnataka and 70 in Kerala added one more dimension to the problem. These

vessels, more or less, vie with each other for the same resource, at the same area leading to conflict and law and problems.

NEED FOR DIVERSIFICATION

Resources of the EEZ with an area of about 2 million sq. km of which 0.86 million is off the west coast, 0.56 million off the east coast and 0.60 million around Andaman and Nicobar Islands remain untapped and offer vast fishery potential.

Therefore, the need for diversification of fishing activities is more relevant at present than ever before. Hence an attempt is made to bring out the technologies available and also suggestions are made to develop suitable new technologies to harvest the resources. Potential resources of the region has been worked out by many agencies and workers. George *et al.* (1977) estimated a potential of yield of 4.5 million tonnes which is about 3 times the present harvest and split-up for the inshore continental shelf and slope and residual area of EEZ are 2.5, 1.5 and 0.5 million tonnes respectively. Another split up is: pelagic resources 2.1 million tonnes; prawns, lobsters and other crustaceans 0.3 million tonnes; cuttlefish and squids 0.2 million tonnes.

Potential of the SW coast, lower east coast, upper east coast and Andaman and Nicobar and Lakshadweep area are 1.4, 0.9, 0.7, 0.016 and 0.009 million tonnes respectively.

Extensive exploratory fishing operations conducted by the FSI, INP (presently IFP), FAO/PFP, and Indo-Polish survey have identified fishery resources capable of supporting intensive fishing activities. The resource are of: Seranids, Lutjanids and Lethrinids of the NW coast, Wadge Bank and Gulf of Mannar; Megalaspis all along the coast; Carrangids and Barracuda along the upper east coast; Lesser sardines of the Gulf of

Mannar; mackerel and *Periacanthus* of the SW coast and east coast; and ribbonfishes, eels, sharks, rays and cephalopods of the NW coast.

DIFFERENT FISHING METHODS

Fisheries research institutions have developed different harvest technologies which can be adopted to exploit the identified resources. Different fishing methods suitable for exploitation of these resources are discussed below.

Gill netting is a selective fishing method and C.I.F.T. has conducted extensive research. This net can be effectively used for tapping the resources of seer, tuna, pomfret and sharks using motorised crafts 7-9 m length all along the coast. At present it is operated only in certain States viz. Kerala, Gujarat, Tamil Nadu. The economics of this energy efficient fishing method is well understood and the fishermen in areas where such crafts are not working should be encouraged to take up. One impediment is the cost of nylon net. Polypropylene is a cheap substitute for nylon and the research in this regard may vigorously be pursued.

Shark long lining is employed from mechanised boats, only along Maharashtra and Gujarat Coasts and in Kerala to a limited extent. Although the technology is known, it should be demonstrated in other areas with improved line hauling devices to increase the catching efficiency by way of using more number of hooks. In areas where more shrimp trawlers are in operation, some of the boats can be engaged in long lining particularly during the poor prawn fishing season. Long line fishing is also energy efficient and fishermen may be encouraged to take up this method.

Trolling is a method for capture of pelagic predatory fishes such as seer, tuna, barracuda, etc., employed in the country. Improved technology has been developed by C.I.F.T.

as an exclusive fishing technique, so it can be carried out during the lean season of shrimp fishing and during sailing to fishing grounds, to supplement the normal catch with high priced varieties. Pole and line fishing is practised around Lakshadweep Islands, but the main constraint for the development of this effective methods for exploitation of the abundant resources is the non-availability of live-bait in sufficient quantities. If live-baits could be cultured and supplied, the resources could be better exploited. Tuna long lining is another method for the exploitation of tuna, shark, marlin and sailfishes. The design, construction and operation of the tuna long-line have been described by many authors and no difficulty is experienced in the construction of the gear. FSI has been operating the gear since long, followed by the IFP and CIFNET. They have located extensive fishing grounds and have reported good seasonal landings. But what is required is the detailed study of the highly migratory tuna, so that the gear can be operated in places where shoals frequent. The ground is located based on movement of water masses, places of convergence of currents, etc. Unless such details are identified, the operations may not become economically feasible. Hence it is imperative that the C.I.F.T. may take up a coordinated project involving all the research institutes, fisheries organisations and universities.

Purse seining for sardine and mackerel in the country is an inshore one when shoals approach towards shore. If shoals do not surface and approach the inshore region, fishery would be a failure for which other causes are also attributed. There is little work to show whether shoals are remaining away from the shore and not surfacing. There is need for further work to establish this and catch the under water shoals by purse seining guided by sonar which was successfully used in Iceland Herring purse seining. Purse

seining for submerged shoals could be improved by effective search and collection of information on the area of concentration of the shoals. Some attempt has already been done and it should be followed up to improve the status of the purse seining fishery.

Pair bottom and mid water trawling is yet another diversified fishing method, the effectiveness of which have been amply demonstrated by the different fishery institutes. The vast resources of the Wadge Bank (anchovies and the resources located by the Indo-Polish survey along the NW coast can be tapped using these fishing methods. These methods can be carried out effectively even from small vessels including the purse seiners which can be converted for pair trawling without much expenditure. It has been proved world over that pair fishing is much more effective than single boat trawling particularly from small vessels as fishes are not frightened by the vessel and towing warp. Similar classes of vessels can be effectively used for capture of cephalopod resources using bottom pair trawling much in the fashion of Taiwanese method.

Mexican method of out-rigger trawling is practiced in the upper east coast and the recently introduced 16.5 m wooden out-rigger trawlers are working successfully. This efficient method is worth trying in other parts of the country.

Traps form an efficient fishing gear for capture of perches found among the rocky bottom where no other fishing technique can be adopted. These resources were identi-

fied and the possibility of economic exploitation have been demonstrated. In spite of this, the resources possibly available all around the country remain unexploited. The construction and fishing technique is simple and the cost of the gear is comparatively low. The deck arrangement of the vessel demands no costly equipment. An echo sounder would facilitate easy location of the ground. Thus the technology developed can effectively be used for tapping the resources.

Presently, cephalopods commands a high price in foreign markets. They are incidental catches in the bottom trawls. Other methods like jigging and lift netting are still in the experimental stage in this country. Analysis of the catch data of the chartered vessels operating particularly the pair trawling would furnish information on the resources of cephalopods. As these vessels are taking common resources, it should be made obligatory on their part to give accurate information of their catches. This information and the results of the work being carried by C.I.F.T. can develop appropriate technology.

CONCLUSION

The diversified fishing techniques suggested for the successful exploitation of the untapped resources would yield enhanced harvest as envisaged in the plan. The research institutions and fisheries organisations must take lead to introduce the diversified methods by intensive extension activities. As transfer of technology is still in infancy, required impetus may be given for the quick dissemination of the new technology.

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