

PROSPECTS OF RAISING MARINE FISH PRODUCTION OF INDIA THROUGH RATIONAL EXPLOITATION OF THE EXCLUSIVE ECONOMIC ZONE

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India declared the Exclusive Economic Zone in the year 1977, thus placing a great responsibility on the country to utilize the zone economically. Various estimates of the potential marine fishery resources varying from 2.3 to 4.47 million tonnes for the EEZ have been given based on primary production, exploratory surveys and catch and effort data. Thus, the estimated harvestable fish potential is about three times the present yield of about 1.5 million tonnes. This large gap between the actual yield and the potential resource is a matter of great concern. In the present day situation, the exploited resources having a high unit value require rational exploitation and judicious management. The untapped deep water and oceanic resources need to be exploited at the optimum level. In the article presented, a brief resume of the exploited and potential marine fishery resources of the country and the possibility of increasing marine fish production is given.

Exploited marine fisheries resources

The marine fishery resources are at present exploited by country crafts using a variety of gears; small mechanised boats using trawl nets, purse-seines, gill nets; and boats fitted with out-board and inboard engines both for propulsion and fishing up to a depth of about 50 m. In addition, large vessels ranging in size between 20 to 23 metres are being operated by the private industry especially in the northern Bay of Bengal, but details of catch rates of these vessels are at present not available for assessing the stocks. Their contribution to total production is expected to be insignificant. Therefore, more than 90% of fish landings can be attributed to the coastal fisheries, as mentioned above.

The major fish landings (average for the years 1983 to 1985) are contributed by the oil sardine, penaeid prawns, Bombay duck, Sciaenids, white baits, lesser sardines, silver bellies, perches, non-penaeid prawns, elasmobranchs, catfish, ribbonfish, pomfrets, mackerel, seer fish, soles, cephalopods and tunnies in the order of their abundance. The northwestern region contributes about 35% of total landings, the southwestern region 34% the southeastern region 17% and the north eastern region 14%. In the northwestern region, Bombay duck, penaeid prawns, sciaenids and non-penaeid prawns are important. In the south western region oil sardine, white bait, mackerel and penaeid prawns are dominant. In the southeastern region silver bellies dominate the catches followed by lesser sardines, perches, penaeid prawns and elasmobranchs. In the north eastern region sciaenids, lesser sardines, penaeid prawns, ribbon fish, catfish, elasmobranchs and perches contribute to the catches.

Potentials marine fisheries resources

Pelagic resources:

The potential of the pelagic stocks is estimated to be 1.85 million tonnes as against the present yield of about 0.7 million tonnes. Additional yield is expected from the white bait, especially from the Gulf of Mannar region and the southwest coast. The total potential of white bait from the EEZ is estimated to be 2.4 lakh tonnes against the current yield of 73,000 t. The magnitude of the additional yield will be about 150,000 t within 20 to 50 m depth by using small purse-seines and mid-water trawls. The carangids are estimated to have a potential stock of 2.65 lakh tonnes against the current yield of 54,000 t. An additional yield of about 200,000 t. would be expected from this resource along the south-west coast, of Gūjarat and north-east coast. Use of mid-water trawls, purse-seines and drift gill nets is suggested. The ribbon-fishes with a potential of 270,000 t. can yield additional quantities from 20 to 80 m depth along the north-west, south-west and south-east coasts. Boat seines

and trawl nets would be ideal gear for the capture of this resource. The small tunas have a potential of 100,000 t. in Andaman waters, 15,000 t. in Lakshadweep and 50,000 t. along the main land coast. Large purse-seines, drift gill nets would help in harvesting these resources.

Ground fish resources:

The estimated potential of these resources is around 1.1 million tonnes as against the current yield of 0.34 million tonnes. Catfish can contribute to an additional resource whose potential is estimated to be 310,000 t. against the present yield of 54,000 t. Productive fishing grounds for this resource have been located along the north-west, south-west and north-east coasts between 20 to 100 m depth. Bottom fish trawls and drift gill nets should be used. Perches with a potential of 250,000 t. against the present yield of 66,000 t. is another major resource. The Kalava, the pink perch and other resident and migrant perches of the Wadge Bank and south-west coasts constitute an important resource between 75 and 225 metres depth. The perch resources of the north-east coast are also significant. Fish trawls, hand lines and traps will help in their capture. The sciaenids indicate a potential of 210,000 t. against the current yield of 107,000 t. Silver bellies indicate a potential of 100,000 t. against the current yield of 67,000 t. These resources can be fished by fish trawls.

Crustacean resources:

The potential yield of penaeid prawns is estimated to be 180,000 t against the current yield of 123,000 t. While very little scope exists for increasing the production of penaeid prawns from the traditional fishing grounds, the non-penaeid prawns have a potential of 105,000 t. against the current yield of 59,000 t. The deep water shrimps and lobster indicate a potential of 12,000 t. against the present yield of about 500 t. The potential of deep water prawns along the south-west coast is estimated at 3,000 t., for deep water lobster at 8,000 t. off the south-west coast and about 1,200 t. off the south-east coast, For exploiting these resources available at 300 to 400 m. depth, large trawlers are needed.

Cephalopod resources:

As compared to the present catch of 23,000 t, the potential for this resource is estimated to be 180,000 t. The average annual stocks of the presently exploited species indicate great scope for increasing production from the exploited stocks in the 0 to 50 m depth zone. Besides, rich resources of cephalopods have been identified from the shelf waters at depths ranging from 75 to 200 m. Fish trawls and squid jigs are suitable gear for this resource.

Oceanic resources:

By far, the most important among the oceanic resources which offers the maximum potential for exploitation is constituted by the oceanic tunas such as yellowfin, skipjack, big-eye, albacore, marlins, and the oceanic sharks. These together have a potential of 0.5 million tonnes of which only a fringe of this resource is at present exploited. Recent surveys by long line fishing off south-west coast, Andaman Sea, west of Maldives and eastern Arabian Sea indicated that these areas especially off the west coast of India (12° to 16°N lat. and 70° to 74°E long.), are rich grounds for these fishes yielding catch rates as high as 8.1 to 25 nos/100 hooks. Long lining and purse-seining are expected to yield good results.

Fairly abundant resource of the oceanic squid in the shelf edge and slope of the west coast of India at depths beyond 180 m (lat.7° to 14°N and long.72° to 77°E) was located. Dense concentrations of the species in the northern Arabian sea (lat. 20° to 25°N and long.62° to 67°E) at depths 120 to 200 m were also reported. Squid jigging and trawling will help to harvest these resources.

Other non-conventional resources:

Recent surveys indicated sizeable quantities of Bulls eye, Indian drift fish, Black ruff and other varieties of deep sea fishes from the continental slope off the south-west and south-east coasts in depths 200 to 500 metres. Trawling will augment these resources. (Table 1,2 & 3).

Steps needed for raising production

Although marine fish production which was 0.5 million tonnes at the end of first Five Year Plan registered a three fold increase by the end of Sixth Five Year Plan, the rate of progression has been extremely slow in recent years. The data collected on the exploited marine fisheries resources indicate that any increase from the present area of operation can only be marginal. Increasing the size at capture by suitable mesh regulation and extension of fishing activities beyond the 50 m depth can augment additional quantities of the under exploited resources. Motorisation of the country craft on a rational basis and diversification of fishing are other methods for increasing production. Emphasis should be on capture of fish and not shrimp. These resources may be small tunas, threadfin bream, horse mackerel, scads, ribbon fishes, white baits, etc. The deeper shelf resources include the perches, the deep sea lobster, and deep sea prawns from the continental slope. The economics of commercial operations on such resources have to be worked out urgently by simulated commercial fishing operations. The unfamiliar species of deep shelf include Bulls eye, Indian drift fish, Black ruff, green eye, etc. The larger tunas and squids mainly constitute the oceanic resources. Exploitation of these resources is urgently called for, for augmenting fish production. This would be a capital intensive proposition but should be matched with product development both for domestic and export markets. Speedy organisation of joint ventures could be a solution.

For the rational exploitation and management of the presently exploited resources and utilization of potential resources, there is need for motorisation of the country craft engaged in the traditional fishing grounds for augmenting fish production. This should be done in a planned manner by monitoring the affects of such action on the resources. The purse-seines must be regulated to operate beyond 30 m depth and their numbers also should be controlled. The present intense fishing for shrimp in the coastal areas must be monitored and controlled, especially the cod end size of mesh which should not be less than 30 mm. Future efforts should only be to introduce fish trawls for capture of fin fishes. Indiscriminate destruction of spawners and young fish should be avoided. Efforts should be made to retrieve the by-catches from large vessels and use the same for human consumption by converting into suitable products. Simulated commercial fishing should be conducted for exploiting the potential resources of the deeper areas for determining the economic utilization of such resources. There is a need for designing and developing suitable boat/gear combination for exploiting the potential resources beyond 50 m depth. Adequate infrastructural facilities such as berthing, handling, storage, ice production and marketing at the fishing harbours should be created.

It is imperative that for raising the marine fish production from the Indian EEZ, the potential resources and areas indicated should be properly exploited by extending the fishing activities to the middle and outer shelf, continental slope and oceanic regions of the Exclusive Economic Zone with concurrent developments of infrastructural facilities. Appropriate regulations to conserve marine living resources and control of pollution in coastal areas will go a long way in sustaining marine fish production.

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Table 1 ✓

Estimated annual potential yield of marine fish in the EEZ of India (in thousand tonnes, average for the period 1983 to 1985)

Region	India's present production	Annual potential yield				Total
		Depth:	0-50m	50-200m	beyond 200m	
North-west	549		540	340		880
South-west	529		700	720		1420
South-east	260		480	200		680
North-east	218		540	200		740
Lakshadweep	4		-	90		90
Andaman & Nicobar	4		-	160		160
Oceanic of all regions	-		-	-	500	500
Total	1564		2260	1710	500	4470

3
Table 2 ✓

Groups of fishes and their potential annual yield in the EEZ of India (in thousand tonnes, average for the period 1983 to 1985)

Groups	Present yield	Potential yield
Pelagic fishes	754	1850
Demersal fishes	493	1095
Crustaceans	236	325
Cephalopods	24	180
Miscellaneous	57	520
Oceanic fishes	-	500
Total	1564	4470

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