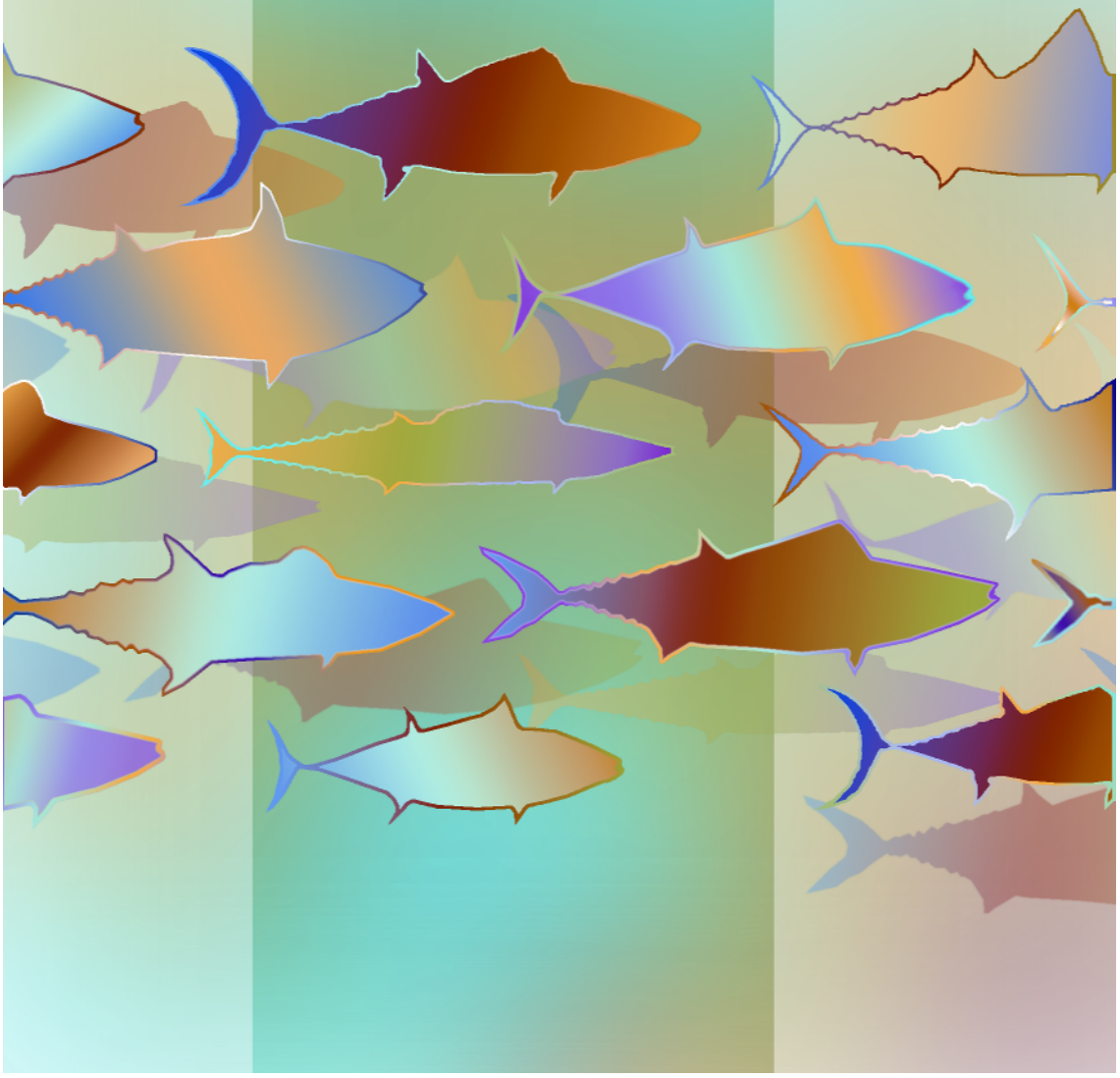
Status of Exploited Marine Fishery Resources of India



STATUS OF EXPLOITED MARINE FISHERY RESOURCES OF INDIA

Editors
M. Mohan Joseph
and
A.A. Jayaprakash

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
(Indian Council of Agricultural Research)
Post Box No. 1603, Tatapuram P.O.
Kochi – 682 014, India

31

Economics and Marketing

R. Sathiadhas, R. Narayanakumar and N. Aswathy

1. Introduction

Marine fisheries in India is accorded priority in the planned development process due to its significant contribution to the economy for generating income in the most backward regions and creating employment to the people who are in the lowest rungs of the social ladder besides providing precious forex earnings and ensuring food and nutritional security. Marine fisheries, inspite of its various complexities and intrinsic sectoral conflicts has come to an industrial footing and requires rigorous research on all economic aspects for management of sustainable resource utilization enabling to face new challenges of globalisation. Resource management for maintaining sustainable production of marine fisheries demand in-depth economic analysis of different production technologies to ensure optimum exploitation, equitable distribution, efficient marketing and evolving alternate management strategies. The Socio-Economic Evaluation and Technology Transfer Division (SEETTD) of Central Marine Fisheries Research Institute (CMFRI) has conducted a number of studies pertaining to fisheries economics during the last two decades in different regions of Indian coast which can be broadly classified into (1) Economics of different crafts – gear combinations, (2) Studies on marine fish marketing and price spread, (3) Socio-Economic studies of coastal fisherfolk and (4) Economic evaluation of mariculture practices. The conclusions emerged from these studies and future policy options for sustainable development are highlighted here.

2. Economics of different types of marine fishing units

Costs and earnings studies have been conducted for all types of fishing units such as trawlers, purseseiners, gillnetters, ringseiners and other types of motorised

and non-motorised traditional fishing units with different types of craft-gear combination to bring out their profitability and techno-economic viability. These studies have helped the individual entrepreneurs and ordinary fishermen in decision making in their technological options for their fishing venture and the financial institutions to verify the economic viability of various fishing methods in formulating their credit policy.

Economics of different types of fishing units indicate that almost all type of fishing units, on an average, run on profit as their production surpasses the break even point. However, due to the nature of competition of open access marine fisheries, many of the less efficient units belonging to each category are being phased out of operation due to losses. The non-mechanised sector is surviving and sustaining only as a family enterprise. Marginalisation of indigenous sector and over capitalisation pose a serious problem. The capital investment on fishing equipments alone at the price level of 1999-2000 is worked out at Rs.4,200 crores. There is substantial idle capacity of fishing fleets in mechanised, motorised and non-motorised sectors. Employment in active fishing is 10.25 lakh fishermen. The pre and post harvest sector provides employment for another 12 lakh fisherfolk including 5 lakh women. The increase in operational costs including oil expenditure have been more than compensated by the increase in fish prices. The over dependence of prawn catches for the sustenance of trawlers is slowly being reduced due to increase in price of other varieties of fish in the internal markets. The purseseiner which required maximum quantity of fuel for its operation was more fuel efficient as the return for the one rupee spent on fuel was maximum for purseseiner than all other fishing techniques (11.4 kg for purseseiners, 2.1 kg trawlers and 3.4 kg gillnetters) The near shore trawl operations by sail boats along the Tamil Nadu coast and mini trawls introduced since 1985 along the Kerala and Karnataka coasts were found to catch large quantities of juvenile prawns which is not advisable for the long term development of marine fisheries. The multi-species and multi-input nature of marine fisheries has led to under exploitation of the stocks of many low value species of fishes and overexploitation of certain high value vulnerable stocks. The gross income generated at landing centre level from the marine fish catch of 2.70 million tonnes in 1999-2000 is about Rs. 10,486 crores. Promotion of 'co-operative fishing' instead of 'competitive fishing' is advisable for optimum exploitation and introducing regulations.

Fish marketing problems and price behaviour

The growth of fish production and overall development of fisheries sector depend largely on an efficient marketing system. Studies on fish marketing and price behaviour conducted by CMFRI helped to advance the frontiers of knowledge in fish marketing system in India and to improve its efficiency. Some of the highlights of the findings are summarised below.

Fishermens' share in consumers' rupee at all India level ranges from 30% to 68% for different species/groups of marine fish. Marketing costs including

transportation range from 6% to 13% of the consumers' rupee. The wholesalers receive 5% to 32% and the retailers from 14% to 47% of the consumer's rupee for different species/groups of marine fish. State-wise analysis indicates that fishermen in Gujarat receive 37% (Catfishes) to 83% (Ribbon fishes) of the consumers' rupee, while it ranges from 36% (Sharks and Barracudas) to 81% (Seerfishes) in Maharashtra, 31% (Lizardfishes) to 71% (Cephalopods) in Kerala, 32% (Silverbellies) to 67% (Big-jawed jumper) in Tamil Nadu and 17% (Sharks) to 58% (Sardines) in Andhra Pradesh. The post-harvest sector has shown substantial growth in infrastructure development, expansion of internal marketing and boost in export earnings. The extent of spoilage of fish is reduced due to wide spread use of ice, technological improvement in processing and transportation facilities. The value of marine fish at consumer level during 1999-2000 is estimated at Rs. 17,861 crores. Export earnings alone increased from Rs. 4.5 crores in 1960-61 to Rs. 6,444 crores in 2000-01. About 85% of the catch is channelised to the internal marketing system and the rest for exports. Hardly 5% of fish in the internal marketing system is marketed by cooperatives and the rest is through private marketing agencies and traders. Fishermen's share in consumer's rupee is high for the varieties having higher consumer preference. Product development and utilisation of discards, thrust for value added products, support price for commercially important varieties, identification and cataloguing of pharmaceutically important marine products, utilisation of idle capacity of processing plants for internal marketing, promotion of cooperative marketing and cautious marketing policy of according parallel importance to both domestic and export marketing are some of the suggestions given for improvement.

Socio-economic studies of marine fisherfolk

Lack of socio-economic information has been one of the most serious impediments to effective policy making and planning, especially in the case of small-scale fisheries. At present, there are about 2,251 fish landing centres and 3,638 marine fishing villages in our country. The marine fishermen households located along our coastal belt increased from about 3.5 lakh during 1980 to 5 lakh during 1997. Studies on the socio-economic status of marine fisherfolk have been conducted at selected fishing villages. Fishing villages all along the Indian coast are almost similar in their backwardness and underdevelopment. The socio-economic parameters like housing, literacy, employment, income, investment, expenditure pattern, and indebtedness and credit facilities of fishermen households were studied at selected centres. During 2001, only about 20% of the active fishermen had ownership on fishing equipment. The annual percapita production per active fishermen declined from 3,250 kg in 1980 to 2,200 kg in 2001.

3. Economic evaluation of mariculture practices

India is endowed with 1.2 million hectares of potential area suitable for aquaculture. The country produced about 97,100 tonnes of shrimps by culture from an area of 1.46 lakh hectares in 2000-01. There is urgent need to bring the

entire area suitable for mariculture into effective use not only for culture of shrimps but also for crabs, lobsters, bivalves and finfishes depending on site suitability and economic feasibility. Profitability of mud crab culture, lobster fattening, mussel culture, edible oyster culture and pearl culture have been worked out and released as technology transfer series for the benefit of end users. Investment avenues in feed industry and hatchery production of seeds have also been indicated to guide prospective entrepreneurs. Input output relationship and factor efficiency in prawn farming in different regions have been worked out. Impact of coastal aquaculture in Tamil Nadu was studied. The widespread socio-economic conflict is mainly attributed due to the excessive stocking density and also the non-involvement of the local fisherfolks. Studies in Kerala indicated that the introduction of brackishwater and coastal mariculture through co-operatives is more advisable due to the common property nature of resource and the existence of traditional fishing rights.

4. Policy options

Besides supplying nutritive food, marine fisheries ensure the livelihood security of about three million people inhabiting the coastal belt and an equal number depending on the post harvest sector. In the export front, the forex earning of marine products reached the level of Rs. 6,444 crores (2000-01). Though fisheries sector contributes to about 1.3 per cent of the GDP, the plan allocation is consistently low, forming only about 0.3 per cent of the total outlay till the Ninth Five Year Plan which requires substantial enhancement for the balanced development of this key sector.

Though the marine fish production has increased from 0.5million tonnes in 1950 to 2.70 million tonnes in 2000, the per capita production of all types of fishing units has declined over the years. This has been due to the fact that each fisherman continues fishing as long as his average cost of fishing equals average returns. Hence, regulation of fishing fleet specifically within the 50 m depth needs top priority. Besides, within the fishing sectors, the average annual production per active fisherman was 332kg for those operating non-mechanised craft and 9,880 kg for mechanised craft. This wide gap has not only led to marginalisation of traditional fishermen, but also enhanced the conflicts between mechanised and non-mechanised boat operators. Since, the economic viability and financial feasibility of these crafts have been established by many studies, phasing out of traditional boats with motorized crafts is advisable. Marine fisheries sector is providing employment to about 10.25 lakh fishers in active fishing in which about 80% are in the traditional sector. However, disguised unemployment is rampant in the already overexploited inshore fisheries. In addition to motorisation, withdrawal of substantial labour force from the inshore fisheries is highly advisable for optimising production without affecting sustainable development, by formulating suitable programmes for their redeployment and rehabilitation under the overall framework of the integrated coastal zone management within the coastal agro-eco system.

In the small scale mechanised sector, the pressure of fishing in the inshore zone can be further reduced through the deployment of existing comparatively bigger

sized mechanised vessels with suitable modifications in the offshore regions. Already it is estimated that the country has 56% of excess capacity of fishing fleets in the mechanised sector, which can be utilised for this purpose.

As the fishery resources are under intensive exploitation leading even to the disappearance of certain species, adequate measures to replenish stocks need to be identified and implemented. Sea ranching of some of the high value species in our coastal waters offers immense scope for stock enhancement and better productivity. Further, sea farming offers immense scope for development. Open sea mariculture of mussels, pearl oysters, edible oysters and other candidate species in the calm bays and coastal waters should also be given due importance in the future development plans which will help to improve the mariculture production in India besides bridging the national and global demand-supply gap of fish.

The installation of artificial reefs in the open sea has been found suitable to increase the fish production. Their establishments can be encouraged through adequate policy support. Currently along the coasts of Trivandurm and Kanyakumari, as many as 31 artificial reefs are functional, yielding good results. This will help substantially to improve the production and productivity of the inshore capture fisheries. These attempts should be given due encouragement in future Plans.

Technologies are available for the cage culture of some of the costly varieties of crustaceans and finfishes in many ideal locations of our coastal waters. However, fishers are not enthusiastic to take up these technologies, as there is considerable confusion in the utilization policies of our public water bodies. Fishing rights of traditional fishermen and incidence of poaching are the major serious constraints in the adoption of these technologies. Hence adequate legal protection and policy support should be extended for the promotion of coastal cage culture programmes.

Out of the current fishery resource potential of 3.93 million tonnes of annual harvestible resources from the Indian EEZ, the available 2.2 million tonnes from the inshore region is almost completely exploited, leaving scope for further exploitation only in the offshore and deep-sea zones. To harness this potential of 1.72 million tonnes, adequate policy support for deep sea fishing (DSF) is essential. The current situation of virtual absence of a Deep-sea Fishing Policy is highly detrimental to the growth of the marine fisheries and a clear-cut policy should be evolved and implemented without any delay.

India is rich in marine biodiversity and has vast stretches of mangroves and coral reefs around Gulf of Mannar, Palk Bay, Gulf of Kutch, Andaman and Nicobar, and Lakshadweep Islands. These fragile ecosystems are affected by indiscriminate exploitation and unplanned development activities. There is an urgent need to delineate environmentally rich regions and preserve them through declaration of protected areas, establishment of marine parks, biosphere reserves and national sanctuaries.

The proportion of discards in the total catch is increasing and it has been estimated that at global level, about 25% of the catch are being thrown back as discards. In India also it is in an increasing trend with the introduction of multi-day fishing in recent years. This will affect the sustainable development of marine fisheries. Hence adequate awareness has to be created among the fishing community through sustained extension campaigns about the significance of economic waste and the environmental hazards of the discards and about fishery resource conservation for long term sustenance of the sector and maintaining inter and intra generational equity.

In marine fish marketing, initially almost all of the 2,251 landing centres located all along the 8,129 km of Indian coast, served as primary markets. Gradually the importance of traditional landing points shifted to a few selected urban centres mainly because of mechanisation of fishing and diversion of fish catch to meet the export demand and also better fishery infrastructure available in these areas. As a result, the importance of rural markets declined and the rural consumers were even deprived of their preferred varieties though they were prepared to pay high price. Hence, development of domestic rural fish markets and market penetration to interior areas should be given prime importance. Adequate fishery infrastructure like freezing/ ice plants, cold storage units may be established in the marketing centres which will help to store excess catch during the glut and sell it at a good price later.

The post harvest sector of marine fisheries employs about 12 lakh people both in domestic and export markets. Among them, about 5 lakh are fisherwomen engaged mainly in fish drying, prawn peeling and fish marketing. Presently they are unorganised, facing problems of wage differentials, gender bias, unfair treatment and exploitation. Necessary steps may be initiated to treat them on par with organised labour, and extend all possible welfare measures to them.

The excessive dependence on export market is not advisable for the long-term sustainable development of fisheries. Any crash in the export market at any time may lead to the collapse of the industry. Hence, parallel development of internal marketing system should be given adequate importance.

The composition of our seafood export needs change since it comprises mainly frozen raw materials (about 90%). Product diversification and value addition in the Indian sea food export need to be improved. Encouragement should be given for the promotion of value added products maintaining high quality standards by private entrepreneurs to increase our export earnings.

Besides the value addition by exporters to cater to the overseas markets, emphasis should be given for small-scale value addition such as preparation of fish pickles, wafers, dried fish, and masmin and other types of ready to eat items as a cottage industry by the fisher households. This will help to improve the utilisation of fish and fishery products in the domestic markets and thereby increase the employment and income of the fisher households.

Some of the marine fishes like sharks, sea horses and sponges have immense pharmaceutical value. Necessary policy guidelines should be evolved to catalogue

these resources and patent the pharmaceutically important products developed from them under the new IPR regime. Fishing industry further produces enormous amounts of byproducts. The amount of chitin and chitosan sources generated by the prawn industry alone runs to the tune of about 50, 000 tonnes annually. All the byproducts generated from fisheries should be used effectively in medicinal, pharmaceutical and cosmetic industries.

The census of Indian fishery has not been done effectively in the country after 1980. The census provides the vital information for formulating fishery development plans. Hence periodical census of the Indian fishery sector by a central fishery research institute should be undertaken once in five years. Further, continuous monitoring of the economic performance of different fishing units in different regions at macro level, organising market surveys, marketing research of marine fisheries and periodic socio-economic studies of the fishing communities should be attempted. This systematic study will be of much use for the policy makers to formulate and update a comprehensive fishery policy for India.

5. Suggested reading

Devaraj, M., R. Paulraj, E. Vivekanandan, K. Balan, R. Sathiadhas and M. Srinath 1996. Coastal fisheries and aquaculture management in the East Coast of India. Mar. Fish. Infor. Serv.T & E Ser., 141: 1-9.

Devaraj, M., V.S.R R. Murthy , R. Sathiadhas and K.K. Joshi. 1998. New economic policy and perspective for marine fisheries and management in India. Fishing Chimes 8(5): 18-29

Devaraj, M., K.N. Kurup, N.G.K. Pillai, K. Balan, E. Vivekanandan and R. Sathiadhas. 1977. Status, prospects and management of small pelagic fisheries in India. Small pelagic resources and their fisheries in the Asia Pacific region. In: Devaraj, M. and P. Martosubroto, (Eds.), Proceedings of the APFIC Working Party on marine fisheries, First Session 13-16 May 1997, Bangkok, Thailand. RAP Publication 1997/31: 91-198

Narayanakumar, R., K.K.P Panikkar, D.B.S. Sehara, and R. Sathiadhas. 2000. Socio-economic analysis of marine fishermen in India. In: V.N. Pillai and N.G. Menon (Eds.), Marine Fisheries Research and Management, CMFRI, Cochin. p 895-906

Panikkar, K.K.P. and R. Sathiadhas. 1993. The structural changes in Karnataka marine fishery and its socio-economic implications. Mar. Fish. Infor. Serv.T & E Ser., 121: 1-8.

Sathiadhas, R. 1996. Economic evaluation of marine fisheries in India for sustainable production and coastal zone development, Naga, The ICLARM Quarterly, 19 (3): 54-56

Sathiadhas, R. 1996. Production and marketing management of marine fisheries in India, Daya Publishing House, Delhi.

Sathiadhas, R. and K.K.P. Panikkar. 1988. A study on marketing structure and price behaviour of marine fish in Tamil Nadu. Sea food Export Journal, 20 (12): 5-29.

Sathiadhas, R. and K.K.P. Panikkar. 1989. Costs and earnings of trawlers operating at Tuticorin (Tamil Nadu), Mar. Fish. Infor. Serv. T&E Ser., 100: 1-8.

Sathiadhas, R., K.K.P. Panikkar and K.P. Salini. 1993. An economic evaluation of ring seine fishery along Kerala coast, Sea food Export Journal, 25(8): 18-41.

Sathiadhas, R. and R. Narayanakumar. 1994. Price policy and fish marketing system in India. Journal of Biology Education, II (4): 225-241.

Sathiadhas, R., R. Reghu and V.K. Suresh. 1996. Economic evaluation of composite culture practices of crab fattening and fish- shrimp farming in Kerala, Fishing Chimes, 16(4): 31-34.

Sathiadhas, R., R. Narayanakumar, Sheela Immanuel and Bastin Fernando. 2000. Domestic marketing and infrastructure development of marine fisheries in India, Proceedings of the Workshop on Rural fish marketing, organised by Tuticorin Fisheries College and NAM, Tuticorin, September, 2000.