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60 Socio-economic analysis of marine fishermen in India

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ABSTRACT

The socio-economic conditions of the marine fishermen and their attitude towards development schemes will serve as back ground information which is vital for implementing new technologies and policies. With this view in focus, the Central Marine Fisheries Research Institute has been continuously monitoring the socio-economic conditions of the traditional fishermen and conducted several studies along the coastal belt to assess the existing socio-economic status and to evaluate the socio-economic impact of innovations on them. In this paper, the socio-economic parameters such as family size, age structure, educational and occupational pattern, customs, beliefs and the standard of living of the coastal fishermen household have been analysed. In the socio-economic impact evaluation studies, the changes that have been brought about by the mechanisation of fishing industry in terms of income and employment generation and investment on fishing equipments have been discussed. The recommendations to improve the socio-economic conditions of the marine fishermen based on the studies have been proposed.

Introduction

The overall development of marine fisheries in India depends on the rational exploitation of the potential yield in the Indian Exclusive Economic Zone (which is about 2.02 million sq. km) and the successful culture of finfishes and shellfishes. Besides increasing fish production to the maximum the fisheries development should aim at raising nutritional level of the people and improving the socio-economic condition of the fishermen. The marine fishermen in India, in general, are socially and economically backward. Hence, any innovation in marine fisheries including new technologies besides

increasing the yield from capture and culture sector, should be economically and technically efficient and socially acceptable. Any sort of technological innovation, financial scheme or management practice needs to be analysed to assess its socio-economic, environmental and ecological impact. The study of socio-economic parameters such as family size, age structure, employment potentials, education and living standards of fishermen will help to identify the constraints obstructing the realisation of full potential of development schemes and adoption of new technologies. The studies conducted by the CMFRI on socio-economics are discussed under two headings viz a) Assessment of socio-economic parameters and b) impact of innovations on fishermen economy and the results are presented here.

Materials and methods

The data collection for conducting the socio-economic survey was carried out using three types of schedules. The first schedule was used to survey on village particulars such as geographical area, population, number of households and infrastructure facilities like cold storage, boat repairing yards, peeling sheds and related aspects. The second schedule was used to collect data from fishermen household on particulars relating to family details such as family size, literacy, number of persons engaged in fishing and related activities, number of crafts and gears possessed and their income. The third schedule was used to collect monthly data on sample households representing different occupation groups about their income and expenditure pattern. The various terminologies used in the socio-economic studies are given below:

1. Fishermen household: Any household, wherein atleast one member of family is engaged either in fishing or fishing related activities.

2. Types of houses

(a) Hut: A dwelling with thatched roof and having either a mud wall or an enclosure made of 'thattis'.

(b) Kutcha house: A dwelling with thatched roof and a brick wall (c) Pucca house : A dwelling with tiled roof and brick wall.

(d) Mansion : A dwelling having a concrete roof.

3. Educational status

(a) primary : those who have passed 5th standard

(b) Middle : Those who have passed 8th standard

(c) secondary : Those who have passed 10th standard

(d) Higher secondary and above: Those who have passed higher secondary exams and taken to higher courses.

4. Major occupation: Occupation which brings more than 50% of the households income.

5. Work force: Persons available for employment, excluding children below 12 years, those above 60 years and students.

6. Fishery and related activities: Those who are engaged in fish trading, net making/repairing, curing and processing and boat building/repairing come under this category.

Assessment of socio-economic parameters

Fisheries in India, supports the livelihood of about 10 million people. One of the objectives of fisheries development programmes is to improve the socio-economic condition of the fishermen in terms of education, health, income and standard of living.

During 1980, in Calicut region, the socio-economic conditions of the fishermen in Puthiappa-Puthiangadi and Elathur were studied. In Puthiappa-Puthiangadi region, the size of the fishermen family was large (9.0) as compared to non fishermen family (6.6), because of the joint family system. In Elathur, the size of the fishermen and non-fishermen family was 7.8 and 6.2 respectively. In Puthiappa-Puthiangadi area, 65.6% of the families were engaged in fishing whereas in Elathur 47% were engaged in fishing. The proportion of people earning an annual income between Rs. 501 to Rs. 1000 was 22% in Puthiappa-Puthiangadi area and 82% in Elathur area. In Puthiappa-Puthiangadi 12% of the fishermen household received an annual income between Rs.3000 and Rs. 10,000 while in Elathur only 5% of the fishermen were under this income bracket. In Puthiappa-Puthiangadi, 75% of the fishermen families were indebted and in Elathur village only 9% were indebted.

During 1983, the economic condition of the fishermen in some selected villages of Maharashtra and Gujarat were evaluated. The illiteracy rate ranged from 48 to 75% and among the literates majority had primary education only. The size of the family was 7-8 and the earning members in different categories were 40-59%. The number of annual fishing days ranged from 200 to 244. The average annual net fishery income for mechanised group, non-mechanised group, gear owners, fishery and allied group was Rs. 10000, Rs. 4500, Rs. 3800 and Rs. 3500 respectively in Maharashtra and Rs. 12000, Rs. 5600, Rs. 4400 and Rs. 3500 respectively in Gujarat. Significant difference in annual income was observed between categories and between villages. For different categories 53-91% of the total income in Maharashtra and 57-91% in Gujarat were obtained from fishery. The proportion of total income spent on household items ranged from 60 to 94% in Maharashtra and 57 to 93% in Gujarat. In Maharashtra, 62-84% and in Gujrat 58-78% of the total number of families in different categories were indebted. The average outstanding loan per family was about Rs. 4000 in Maharashtra and Rs. 3000 in Gujarat. The regression analysis showed that one rupee increase in operational fishing expenditure was responsible for Rs. 0.15 and Rs. 0.13 increase in net fishery income in Maharashtra and Gujarat respectively.

Another study conducted during 1982-83 in Tirunelveli Coast of Tamil Nadu to find out the socio-economic characteristics of fishermen and to assess the extent of capital investment on means of production,fishing income, level of income and credit utilisation pattern indicated that the socio-economic status of the fishermen was low. The average annual income of a fishermen household was Rs. 4886 with a per capita income of Rs. 869. The literacy rate was 28% only, much below the State average of 46% (1981 Census). The percentage of people involved in traditional fishing was only 31% against the State average of 36% . About 55% of the people had no means of production such as craft and gear and the private money lenders dominated in financing the fishermen accounting for about 66% of the loan advanced to them.

Another socio-economic study conducted during 1984-85 along the Madras Coast, showed that most of the fishermen -90% in Thiruvottiyurkuppam and 66% in Pudumanikuppam -were living in huts. The proportion of illiterates was 67% in Pudumanikuppam and47% in Thiruvottiyurkuppam. About 60% ofthe fishermen in Pudumanikuppam and 56% in Thiruvottiyurkuppam

were engaged in active fishing. The fishermen of Thiruvottiyurkuppam completely depended on indigenous fishing whereas in Pudumanikuppam the fishermen depended on traditional and mechanised fishing. The average annual income of the fishermen household was worked out at Rs. 7600 at Pudumanikuppam and Rs. 4500 at Thiruvottiyurkuppam. The daily household expenditure worked out at Rs. 21 for catamaran owners, Rs. 15 for wage earners and Rs 16 for families engaged in fishery related activities in Pudumanikuppam whereas the corresponding figures for the same categories in Thiruvottiyurkuppam worked out at Rs. 17, Rs. 11 and Rs. 12 respectively. 47% of the households in Pudumanikuppam and 42% in Thiruvottiyurkuppam were indebted. The role of cooperatives and commercial banks in supplying credit was found to be negligible.

During 1987-88, in Porbunder of Gujarat about 1000 families were residing with a population of 7,800. The general amenities in fishermen village could be easily graded as good. The National Cooperative Development Corporation and fish traders were the major sources of finance. The average initial investment on a trawler was worked out at Rs. 4.04 lakh with an annual fixed cost of Rs. 1,27,000. The gross revenue of a trawl unit was worked out at Rs. 4,53,638 and the net over operating expenses income at Rs. 1.5 lakh. The rate of return to capital was 18% and the pay back period was worked out at 6 years. The cost of production per kg of fish was Rs. 6.36 and the net profit margin was Rs. 0.33 per kg. Some of the important observations included the slow pace of mechanisation due to lack of institutional support from the government, conflicts between the Indian and Pakistani fishermen in the Kutch region and poor participation of women in fishery activities.

The study conducted during 1989-90 to evaluate the socio-economic condition of traditional fishermen living along the Thanjavur Coast of Tamil Nadu indicated that most of the fishermen were living in temporary structures like *kutcha* houses and huts. The average annual income of a fisherman household was worked out at Rs. 11,778 at Mallipattinam and Rs. 8,074 at Keechankuppam, with the per capita income of Rs. 2356 and Rs. 1615 respectively. The literacy rate in both the centres was less than 20% which was well below the State average of 46% (1981 Census). The working population was worked out at 30% in Mallipattinam and 32% at Keechankuppam. Institutional financial support was found to be inadequate since 54-60% of

the loan was advanced by the private money lenders. A critical analysis of the expenditure pattern revealed that 58% of the family income in Mallipattinam and 82% in Keechankupam villages was spent on food.

Orissa government started a massive prawn farming programme in 1982-83 by which it distributed 0.2 hectare of water area for prawn culture to selected beneficiaries. Under Economic Rehabilitation for Rural Poor Programme the ponds were provided to the beneficiaries in Ganjam and Puri Districts of Orissa. The survey was conducted in seven clusters: five in Ganjam District and two in Puri District covering 70% of the beneficiaries. The average family size of the beneficiaries was 6.7. The literacy level ranged from 21% in Mudiratha to 71.3% in Haripur and the average literacy level of the beneficiaries was comparatively higher than that of the Orissa State. The percentage of workers to total population ranged from 16.4 in Gopakunda in Ganjim District to 30.4 for Madiratha in Puri District. The percentage of working population to total adults ranged from 31 to 51. The literates were reluctant to work as agricultural labourers and were engaged in non-fishery activities. But after the introduction of ERRP programme all the adults in the families including women (not otherwise employed) participated in the prawn farming activities. Many social problems developed because of the introduction of prawn farming. Initially the landless labourers who were given the ponds on long term lease faced managerial problems due to lack of experience and conventional approach to prawn farming as business. The remoteness of the farms led to the dislocation of the families and affected the education of their children. In addition to this, the lack of adequate transport and communication facilities resulted in poor marketing of prawns. The cost of production per kg of prawn was maximum (Rs. 113) in Binchinapalli cluster of Ganjam District and minimum (Rs. 39.39) in Janicuda cluster of Puri District. The high level of unit cost in Ganjam District was attributed to low level of productivity as compared to Puri District. The average gross income per crop per pond was worked out at Rs. 2530 in Puri District and Rs. 1432 in Ganjam District. The returns to labour assumes more importance here because this programme was mainly aimed at landless labourers. In Puri District the returns to labour was higher than the opportunity cost of Rs. 10/ man/ day whereas in Ganjam District in some clusters it was less than the opportunity cost which was attributed to low productivity.

The average family size in Poonthura village near Thiruvanathapuram

in 1985 was 6.3 and about 69% of the families were living in huts. The literacy rate was 46% and 89% of the literates had education upto primary standard only. The working population was worked out at 36% of which 29% were women engaged in net making/repairing and fish processing. About 64% of the workers were active fishermen of which 62% were owner operators, 4% non-operating owners and the rest wage earners. The analysis of ownership and investment pattern indicated that, 66% of fishermen households had ownership of means of production. About 28% of the fishermen households had invested less than Rs. 3000 in fishing implements whereas 17% had invested between Rs. 5000 and Rs. 7000. It was found that 70% of the owners had invested less than Rs. 10000 on fishing equipments. The average annual net income of a fishermen household in Poonthura village was worked out at Rs. 11,603 and the per capita income being Rs. 1,56. Among the owners of canoes and catamarans, the majority have earned an annual income in the range of Rs. 9000 to Rs. 22000 and among the wage earners the majority had income range of Rs. 7000-12000. The average annual income of the owner operators was Rs. 12185, wage earners, Rs. 9130 and families engaged in fishery related activities, Rs. 8200. It was found that about 50% of the fishermen families were in debt and the outstanding debt per family averaged Rs. 9022. Financial support through institutional agencies was only 23% and the rest were financed by money lenders, boat owners and fish merchants. The analysis of credit utilisation pattern revealed that about 62% of the loan amount was utilised for investment purpose of which 54% was invested on fishing equipments. The average annual expenditure of the fishermen family in Poonthura worked out at Rs. 10598 and 75% of the family income was spent on food alone.

The average family size in 1992 in Ernakulam District of Kerala was 7.7, 5.5 and 5.6 for marginal, small and large fish farmers respectively. The literacy level of the marginal farmers was less than high school qualification while 6% of the small farmers were graduates and post-graduates. Most of the marginal farmers and about one-third of small farmers were dwelling in *kutcha* houses. Most of the fish farmers have taken the ponds on lease at the rate of about Rs. 10000 per hectare. Prawn farming contributed about 80% of the annual gross income of small and marginal farms. The net return per acre was worked out at Rs. 3610 for small farms, Rs.1377 for marginal farms and Rs. 241 for large farms. The production function analysis showed that critical inputs such as seed and labour had been under utilized and that

the same can be enhanced to 3-4 times to get maximum profitable level of output.

A socio-economic survey conducted for the Development and Educational Communication Unit (DECU) of Space Application Centre (SAC), Ahemadabad during 1995 in the two brackish water sites, Kodungallur and Mulavugadu in Kerala identified by the Indian Space Research Organisation (ISRO), using satellite imageries to study the feasibility of establishing aquaculture farms on a cooperative basis indicated a high literacy rate of 85-90%. Mulavugadu had a high proportion of young and middle age group populace which is said to be conducive for adoption of any technology. Fishing was the major occupation and about 70% of the sample respondents were dwelling in *kutcha* houses in both the selected sites. Most of the sample respondents (90% in Kodungallur and 83% in Mulavugadu) were owning a land area of less than 25 cents. There was a significant difference in income levels between the fishermen of the two sites. In Kodungallur 62% of the households earned an annual income below Rs. 25000 whereas in Mulavugadu 85% got an annual income in the range of Rs. 25000 - 50000. This high level of income of fish farmers in Mulavugadu might be due to their proximity to Cochin city which offers adequate job opportunities, substantial number of fishermen practicing traditional prawn farming and good remuneration obtained from brackishwater fish farming. The respondents expressed their willingness to form brackishwater fisheries cooperatives to undertake this proposed scheme.

Impact of innovations on fishermen economy

Mechanisation of fishing fleet could increase the yield but at the same time it seriously affected the employment status and income level of artisanal fishermen who depend wholly on indigenous crafts and gears. Their problems should be looked into from socio-economic point of view.

A study undertaken in Karnataka in 1978 to assess the socio-economic impact of mechanisation on traditional fishermen operating *rampani* gear revealed that the introduction of commercial purse seiners had affected the *rampani* operation. The number of *rampani* nets operating in South Kanara District declined from 75 in 1977 to 30 in 1979 and a marginal reduction was observed in North Kanara District. About 14% of the active fishermen engaged in rampani operation were thrown out of employment during 1978-79

as compared to 1977-78. The average annual revenue received by a *rampani* unit declined from Rs. 2.7 lakhs in 1977 to Rs. 13,000 in the first half of 1979. But in North Kanara District, the earnings from *rampani* remained more or less same because only a limited number of purse seiners were operating in the region. The annual per capita revenue of a *rampani* unit declined from about Rs. 3370 in 1977 to Rs. 300-400 in 1979 i.e. one-eighth of the income received earlier. A reduction of employment in *rampani* units was observed from 6000 (in 75 units) in 1979 to 2400 (in 30 units) in 1979. Hence, the introduction of commercial purse seiners has adversely affected the traditional *rampani* operation. In Sakthikulangara and Neendakara of Kerala, the proportion of *kutcha* houses had decreased from 44% in Sakthikulangara and 29% in Neendakara in 1954 to 16% in both the places in 1980. The proportion of *pucca* houses and mansions had increased from 9% to 51% in Sakthikulangara and 6% to 20% in Neendakra. There had been a three and half times increase in the employment opportunities in fishing and fishery activities. The number of non-mechanised crafts had declined from 493 in 1953 to 214 in 1980 and the number of mechanised boats had increased from 138 in 1963 to 336 in 1980. There had been a considerable improvement in infra-structural facilities with the expansion of ice production capacity from 25 t to 350 t and freezing capacity per day from 9 t to 75 t between 1963 and 1980. The income had increased from Rs. 624 in 1954 to Rs. 4975 in 1980 showing an eight fold increase. The benefits of mechanised fishing were found to be more in Sakthikulangara than in Neendakara, because of the concentration of developmental activities at the former.

Another socio-economic survey conducted during 1981 covering 41 landing centres between Quilon and Manjeshwar in Kerala State to find the impact of purse seine operations on the indigenous fisheries, indicated that heavy landings by purse seiners at Cochin and Mangalore were lifted by trucks and transported to various parts of the State. This had attracted the head load and bicycle vendors to wait for these trucks and they didn't go to landing centres to get the catch from country crafts, which were irregular, undependable and providing small quantity of catch. The introduction of purse seine had also affected the catch of country crafts. About 10% of the active fishermen shifted from marine fishing to backwater fishing at least temporarily. The annual average income of a fishermen family had been found to be reduced by about 50% in 1980 as compared to 1979. About 250 traditional fishermen were employed in purse seiners in Cochin Fisheries Harbour.

A study undertaken in Tirunelveli and Kanyakumari Districts of Tamil Nadu during 1981 to find the impact of mechanisation of indigenous crafts with out-board motors on the economy has shown that in Tirunelveli District, the impact of mechanisation was not significant. The gears used by the fishermen in this area were driftnet and hooks & lines. In Kanyakumri District, the gear used by motorised units was hook & line with the aid of artificial baits. The gross returns of the motorised catamarans ranged from Rs. 100 to Rs. 2000 per trip, with an average of Rs. 500. The average operational expenditure worked out at Rs. 130 per trip. Due to motorisation, employment opportunities doubled since a motorised catamaran requires 3 to 5 persons instead of only two in non-mechanised units. There was no marketing problem for disposal of catch. The fishermen reported that they were able to recover 70% of the capital invested during the short span of operation of five months.

An attempt was made to analyse the problems of monsoon fishery and its socio-economic implications along the west coast of India during 1992. During monsoon season (June to August) fishing as a family occupation was at subsistence level except for trawlers and gillnetters at a few centres. The number of mechanised units under operation is reduced to about 10% of the total units and non-mechanised including motorised to 25%. The household income was low as the employment reduced to 25% during monsoon. Consumers had to pay high price for fishes, but the producers' share was low.

In Karnataka, a study on changes in the fishing crafts and gears used, showed that *rampani* boats, dug-out canoes and outrigger boats were used till seventies. In mid-seventies, the mechanised crafts and gears dominated the marine fishery resulting in disappearance of *rampani* boats besides causing a structural change in the socio-economic frame work of Karnataka marine fishery. Before the large scale introduction of purse seiners, fishing was done mostly by *rampani* at subsistence level and village based operation; but after the introduction, marine fishing activity shifted to urban landing centres and 75% of the landings during the middle of eighties were from urban landing centres viz Mangalore, Malpe, Gangolli, Bhatkal, Tadri and Karwar. Though this change paved the way for all-round development of fishing industry in the area, the impact was felt only in urban centres and the villages where *rampani* operation was in vogue, incurred a considerable loss in terms of income . The purse seiners earned an average annual net profit of about

Rs. 1.3 lakhs with 32% rate of return to capital. The large scale motorisation revived the traditional fishing with increased tempo of gillnetters and introduction of new gears like *mattubala* . As a result the rural landing centres have once again become busy. These developments have also improved the fish marketing system in the region.

Aquaculture has gained momentum in the coastal regions in the past ten years and large scale establishment of aquaculture farms have come up. The environmental and the socio-economic impact of such shrimp farming were studied in the Nagapatinam District of Tamil Nadu during September 1995. Because of the commencement of shrimp farming, the land value had increased from about Rs 18000 to Rs 1.8 lakh registering 10 times increase in the last few years. The change of land ownership was another significant impact. The reasons cited by the respondents for the sale of land include the small size of land (20%), high price offered (40%), uneconomical crop production (30%) and lack of labour availability to cultivate crops (10%). The employment generation capacity had considerably increased since the average labour requirement per hectare of paddy cultivation is about 180 days per year whereas in shrimp farming it provides about 600 labour days per crop. In case of female labourer, there is only a little scope in shrimp farms but they get good demand in paddy fields of the adjoining areas. The establishment of aquafarms have created subsidiary occupations such as catering, transport and handling of construction materials and other related activities. The average annual income of a shrimp farm labourer was worked out at Rs 12,000 as against Rs 7,500 earned by an agriculture farm labourer.

Future priorities and conclusion

The various studies on the assessment of socio-economic status have described the living conditions, literacy level, income level and level of indebtedness of fishermen families in different maritime States and those will provide a vital background information. In addition to this, studies explaining the reasons for the existing conditions i.e., analytical socio-economic studies may be conducted in future.

Periodical monitoring of the socio-economic conditions of the marine fishermen at macro level in different maritime States may be undertaken which will help greatly in estimating the success and feasibility of any development programme/scheme drafted for them.

The major missing link in the long range development process is lack of social and economic data. Data on the surplus man power, marketing structure, level of knowledge, skill & education, social & cultural constraints, religious implications and village leadership need to be collected through efficient surveys for further analysis.

Based on the studies conducted in the field of socio-economics the following suggestions are made.

1. More attention should be paid to enhance the literacy level of coastal population since the literacy rate, in general,is low.

2. In case of development of any innovation in marine fisheries, traditional fishermen be ensured of its benefits in terms of employment and income generation.

3. Besides providing loan to procure means of production, the fishermen may be provided operational loan so that they may not depend on private money lenders and fish merchants for meeting day to day operational expenses.

4. Improvement in road transport system in coastal regions will provide better price for catch to the fisherfolk.

5. Before providing segments of water areas to fish farmers for fish/prawn culture they may be trained for successful adoption of aquaculture.

6. Small family norms should be popularised by the Government since the bigger number of dependents create poverty in fishermen community.

7. Since motorisation of country crafts has increased employment opportunities in certain regions, it should be encouraged in other coastal regions also.