



CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

ERNAKULAM, COCHIN-682 031, INDIA

R & D SERIES FOR MARINE FISHERY RESOURCES MANAGEMENT

14. ECONOMICS OF PADDY-CUM-PRAWN CULTURE IN KERALA

Coastal aquaculture has been receiving much importance since the last two decades because of its tremendous potential in augmenting prawn and fish productions and increasing employment opportunities to the coastal fisherfolk. Farming in brackish waters and back waters has been in practice for ages in coastal regions of the country especially in Kerala, Karnataka, Goa and West Bengal. Low-lying areas, extending to over 5,000 hectares, in coastal region of Kerala are utilized for paddy-cum-prawn culture. In these fields paddy is cultivated during June-September period and prawn farming is carried out during October-April.

Cost of Production, Productivity and Income (1981-82)

The average cost of paddy cultivation per hectare worked out at Rs. 2,570 and the revenue at Rs. 3,670, resulting in a net income of Rs. 1,100. It was also observed that the net income per hectare increased as the size of holding increased especially up to 5 hectares. The cost of production per quintal of paddy worked out at Rs. 140 while the average price realised was Rs. 190. The average yield per hectare was about 19 quintals.

In prawn culture, the common practice is to lease out the fields to contractors. The average lease amount per hectare was about Rs. 4,030. Labour charges for the harvesting and the maintenance of sluice gate are the major components of operational costs. The cost of production of prawn worked out at Rs. 5,050 per ha. of which lease amount accounted for about 80 per cent. The

value of the yield came to about Rs. 6,250, fetching a net return of about Rs. 1,200 per ha. The cost of production in the case of fields operated by owners was only Rs. 1,520 per ha excluding the opportunity cost of land, realising higher net returns of Rs. 7,080.

Prawn production worked out at 510 kg per ha. Among different species of prawns, the maximum production was accounted for by *M. dobsoni* (63%), followed by *P. indicus* (27%), *M. monoceros* (9%), and *P. monodon* (1%). *P. indicus* dominated in value, accounting for about 60%, followed by *M. dobsoni* (23%), *M. monoceros* (9%), *P. monodon* (4%) and other fishes (4%). It was observed that the production of *P. indicus* as well as total prawns was higher in the fields nearer to the bar mouth.

The annual net income from both paddy and prawn culture worked out at Rs. 8,180 per ha for the farmers operating themselves and Rs. 5,130 for those leasing out their farms for prawn culture. The overall cost of production of prawns (including the lease amount) was Rs. 10 per kg and the average farm price realised was Rs. 12 per kg.

Estimated Prawn Production and Employment in Ernakulam District

The bulk of the total area under paddy-cum-prawn culture in Kerala is in Ernakulam district, spreading over 4,920 ha. Based on the study, the annual prawn production in paddy fields of Ernakulam district during 1981-82 worked out at 2,500 tonnes. Out of this, the estimated yield of *M. dobsoni* was about 1,590 tonnes and *P. indicus* 680 tonnes. The total value of prawn produced in the paddy fields was estimated at Rs. 29.3 million based on prevailing farm price.

On an average, 53 mandays and 56 womandays per hectare were required for paddy cultivation and 81 mandays for prawn filtration. Ploughing and harvesting are the major components of labour requirement in paddy cultivation and filtration (harvesting) in prawn culture. Accordingly, about 0.26 million mandays and 0.28 million womandays are required for paddy cultivation and about 0.40 million mandays for prawn culture in Ernakulam district. The total employment generated is about 0.94 million labourdays.

Production Trend

The prawn production from the paddy (Pokkali) fields in Vypeen area was of the order of 1,000 kg per ha during

the Fifties and Sixties, whereas it reduced to about 700 kg per ha during the Seventies. The current investigation indicated an average yield of 620 kg per ha in Vypeen area and much less in other areas. It is observed that there has been a declining trend in prawn productivity in the past and stagnancy in recent years.

Analysis of the net earnings of sample farms revealed that there was high variation between them. The group of farms producing *P. indicus* had realised higher income and the farms where it was not available incurred a loss. This clearly indicates that the deciding factor of net returns is the availability of *P. indicus*.

Policy Implications

Some farmers are in favour of prawn culture for the whole year instead of crop production for six months followed by prawn production. But perhaps this may not be a viable proposition. The farms are to be deepened to maintain sufficient water level throughout the year. During the monsoon period the salinity becomes low, which also may not be conducive for prawn production. It is also believed that there is a favourable residual effect of paddy cultivation on the subsequent prawn production. Hence it appears that prawn culture round the year under the existing framework may not be practical proposal.

Another view expressed by a number of farmers is about the desirability of extending the prawn filtration beyond the middle of April. The monthwise production rate shows that generally production increases up to the middle of March and thereafter declines sharply, indicating that prolonging the period beyond middle of April may not result in higher returns.

It may not be easy to develop a complete technology to increase production which will fit into the broad framework existing today as the farmers are used to periodic harvestings (around full moon and new moon days), which provide them regular flow of income. Use of high-yielding prawns like *P. indicus* would help in enhancing the prawn production and returns. The Government and Co-operative Societies could establish hatcheries so as to provide assured supply of seed of *P. indicus*, for which a viable technology has been developed by Central Marine Fisheries Research Institute, Cochin. It may be desirable to evolve cheap feed mixtures suiting to the present set up which can promote

better growth and consequently better weight, resulting in higher price for the prawns.

The outer bunds which are common to many small farms may be strengthened by providing permanent structures by the local government agencies which will reduce the risk involved in cultivation and check the recurring expenses on maintenance of bunds.

There are too many gillnets, castnets chinese dipnets and stakenets operating in the back waters which prevent the free entry of recruits into the farms. It is essential that the Government put a limit to their numbers and strictly enforce the same. This will also help in reducing the catches of immature prawns. The reclamation of the back waters is on the increase for various purposes, which also needs to be regulated so as to allow free flow of water from the bar mouth to the fields, permitting good recruitment to the fishery.

An important aspect which creates tension and uncertainties among the farm operators is the large-scale poaching, which usually takes place before the end of the contract period. It is essential to enforce strong protective measures against this practice.

Another area where Government can come in a big way is to enforce law to control pollution resulting from the discharge of effluents from industrial units. In some of the areas, especially in Varapuzha, near the Eloor-Always industrial belt, proper pollution-control measures should be taken to reduce the adverse effect on paddy crop and large-scale mortality of prawns.

It is essential that production and associated environmental factors are regularly monitored for proper understanding of yield fluctuations, which may facilitate formulation of remedial measures. A good information base would also help in planning suitable programmes for balanced development and management of the rich Cochin backwater region.

Prepared by Shri. R. Sethladas, Shri. K. K. P. Panikkar, Shri. T. Jacob and Shri. U. K. Setyavan based on the information collected during 1981-84 from Ernakulam district (Kerala). Published by P. S. S. R. James, Director, C. M. F. R. I. Cochin 682031.

September, 1987.