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## BLENDING SEA FARMING WITH TRADITIONAL CAPTURE FISHERIES: A NEW CONCEPT

As a result of intensive managerial and research programmes, our marine fisheries gained admirable development through the past 30 years. Since our independence, marine fish production has increased nearly three-fold. This increase is mostly reflected on the export sector — from 15,705 tonnes valued at Rs. 391 lakhs in foreign exchange in 1961, the export has mounted to 62,151 tonnes valued at Rs. 17,986 lakhs in 1976. Many fish-processing and export industries have since got established, so also not-work of ancillary industries for boat building, fish-net manufacturing, and so on.

Nevertheless, the benefit of this development has not reached the million-and-odd active fishermen in the small-scale indigenous fisheries sector, whose per-capita income hardly improved through these years. Consequently, over three million, representing about 0.6% of our population, still live below the poverty line. This sad state of affairs is despite of our hitherto accomplished programmes of mechanising a large number of fishing boats, supplying syn-

thetic nets and net materials, salts and ice and providing improved facilities for handling fish, their transportation, distribution and marketing. The reason for this snail-slow progress of their economic conditions is to an extent due to their conservative nature and high rate of illiteracy still existing. They are not as yet very enthusiastic to change their traditional fishing methods, which is apparent from the fact that crafts and gears of age-old design, with considerable operational limits, are still in vogue, side by side with the most sophisticated ones in many parts of the country. However, modernisation of these fishing means and methods, which is possible only step by step due to many inherent problems, will not alone help solving the situation.

In a developing country like ours, any fishery programme should have in its priority finding ways and means of increasing production, improving rural economy, and developing large-scale employment opportunities. Marine fish production can be increased (a) by exploiting new resources; (b) by increasing the exploitation

of the under-exploited resources; (c) by culturing suitable species in congenial environments. As it is the case in all of the developed and most of the developing countries, our major fishery resources are already under the stress of a level of fishing pressure beyond which it is not possible to exert any further without the risk of overfishing and depletion. New resources were discovered and their potentialities and characteristics were made known, based on which it had been possible to evolve suitable technology for their exploitation and utilisation. Expansion of the fisheries in the deepsea area alone still remains to be achieved, which, however, requires great capital input and, therefore, may not help bringing an immediate solution to the present problem.

Aquaculture, not only in fresh water, but also in the coastal saltwater and marine environments, has since gained world-wide approval as a quick method of increasing fish production. Realising its importance, the Institute took up series of investigations on the technical feasibility of mass-

culture of marine and brackishwater fishes, prawns, mussels, oysters and seaweeds, as a result of which, many a simple indigenous technique was evolved for their cultivation. Without much complicated management procedures, culture of species such as mullets and milkfish, with a production rate of 857.5 Kg/ha/annum, was made possible on a demonstration-basis. Eight of our commercially important prawns have been successfully reared from egg to marketable size under controlled conditions. It has also been demonstrated that by intensive culture of some of these species on scientific lines it would be possible to raise them at a rate of 1 to 1.5 thousand/kg/ha/annum, valued at Rs. 35000 to 50000. Fast-growing mussels have been mass-cultured on simple structures, even in open coastal waters, with an estimated yield, valued at Rs. 1.5-2 lakhs/ha/annum. It has been proved that, using very simple means, seaweeds can be cultivated with great economic advantage. The Institute is at present providing training to rural fishermen through short-term courses, based on the principle of 'learning while doing', in the culture of all these organisms.

Aquaculture can be carried out, without high expertise or huge capital inputs, as a profitable family avocation of the fisherfolks, during their leisure hours. Generally the fishermen leave for fishing early in the morning and return in the afternoon. Seldom do they venture a second trip, so that there will be plenty of time available for this occupation. Moreover, it is seen that all

fishermen do not go for fishing the same day. Thus there will be some job-free men always. Women and children, with a little training can also be usefully engaged in such jobs as seed collection and day-to-day tending of the farms. Thus it is conceived that the blending of culture fisheries along with the normal capture fisheries would greatly help to enhance the production and earnings of the rural fishermen.

An operational research project on this basis is being drawn up for immediate implementation in some of our selected fishing villages. The first to be selected for this purpose is Kovalam, a fishing village 35 km south of Madras. The Institute has a field laboratory established in this village for carrying out investigations on the feasibility of mass-culturing mussels and prawns. As the project site is located very near this laboratory, the transfer of technology will be quick and effective.

Kovalam has 175 families comprising a total population of 975 fishermen. The per-capita income is Rs. 369/- per annum, the source of income being fishing.

The project has the following defined objectives:

1. To establish the possibilities of supplementing traditional fishing with mariculture in order to increase production and improve the socio-economic conditions of the fisherfolk.

2. Demonstrating the feasibility for the culture of mussels and other organisms such as prawns, fish, seaweeds etc. on large scale by transferring the technology available with the Institute.

3. To create sense of involvement and participation among local fishermen in this project by associating them from its initial stages so that the venture becomes self generating and will equip them to sea farming along with their traditional fishing.

4. To demonstrate the scope for overall improvement of the socio-economic conditions of the area through development of infrastructure for processing, marketing and better methods of utilisation.

5. To assess the direct and indirect impact of the project in the area, in comparison with the socio-economic conditions that existed prior to the implementation of the project.

The project is proposed to be taken up in a phased manner.

As the integrated development of fisheries by blending capture and culture fisheries for rural development is a new concept in the marine fisheries sector, the benefits accruing from the project is only an estimation at present. However, it is hoped that it would make a real impact bettering the rural economy. The success of this concept largely depends on the interest and involvement of the fishermen who will have to be induced to take up this venture and their interest sustained. To this direction, it is essential to provide the required assistance and incentives to the fishermen to meet the additional expenditure at least in the initial stages. Continuing rural development depends on the integrated action and co-operation of the technologists planners and financial institutes, besides the actual users.



DR. E. G. SILAS  
DIRECTOR, CMFRI