SESSION IV

TECHNOLOGICAL BASE FOR INTEGRATED RURAL DEVELOPMENT

Keynote Address

E. G. SILAS
Director, Central Marine Fisheries Research Institute, Cochin

For the last three decades our developmental efforts in marine fisheries have been towards increasing production in the capture fisheries, rightly so in view of the vast resources in the coastal waters and the continental shelf which remained to be exploited and the base for development was available in the form of the traditional fisheries. Therefore, our research efforts were also aimed in that direction. The Seventies has been a significant decade in the sense that, on a global basis, there has been a shift from the thinking that capture fisheries could be depended upon for a steady increase in production to the realisation that aquaculture has immense potential for development after witnessing the stagnation of world fish production around 69 million tonnes over a period of three or four years. In India, too, we are passing through a stage of such stagnation in the marine capture fisheries with a production of around 1.3 million tonnes during the last three years. Although the Exclusive Economic Zone has good prospects for increasing production the efforts would be concentrated at a few centres in view of the sophisticated technology and high capital costs involved.

Coastal aquaculture as an additional vocation

Therefore, aquaculture in the coastal areas and the contiguous brackishwater bodies would form an important component in our future plans and programmes for the development of fisheries. Coastal aquaculture is highly suited for the social and economic conditions prevailing in the coastal zone to put to use the unutilised and underutilised water areas for increasing production and provide employment opportunities to thousands and would lead to a balanced develoment of the coastal economy in view of the decentralised and spread effect coastal acquacultur would have.

We are aware of the despendent conditions of our fishermen community. The only profession they know of is fishing. Lack of additional vocations has been one of the reasons for their present state of poverty. The allied occupation of coastal aquaculture would fit into their social, economic and professional setup and the blending of farming with fishing will be a solution for the economic uplift of the fishermen community. It is a happy augury that the Government are giving high priority to the programmes on aquaculture.

Present technological base

Any development involving technologies would dooend on the availabilty of a sound technological base coupled with adequate research support. Although our efforts on coastal aquaculture research has been relatively recent, we have made tremendous strides in poviding a viable technological base. This has been possible because of the right priorities fixed and the will of our scientific community. We have had successive and quick breakthrough in coastal aquaculture technologies. Breeding and culture of marine prawns, technology for production of cultured pearls, oyster farming, mussel culture and seaweed culture are the major advances made in the recent, years. We have developed the technology for the culture of eel in running freshwater system. Attempts have been made to evaluate the

potential of salt-pan reservoirs for fish and prawn production. Fin-fish culture in the coastal lagoons and in mixed farming, crab culture lobster culture and pen culture are some of the other areas where we have made considerable progress.

Most of these technologies have been tested in field conditions for their techno-economic feasibility. While some have already been adopted by the farming community others are in the process of being taken up. Transfer of these technologies is being effected through several programmes such as the Krishi Vigyan Kendra (Farm Science Centre), Operational Research Project, Lab-to-Land Programme, Demostration Projects, *ad hoc* training courses and consultancy service. Due to all these efforts, today there is a general awareness among the people of the coastal zone of the possibilities of aquaculture and this is a healthy sign for the development of a coastal aquaculture industry.

Additional thrusts for strengthening the technological base

While the scientific community can be proud of its achievements so far, there is no room for complacency. On a macro-level we have developed the various culture systems to provide the immediate technological base. But on a micro-level, there is a lot that remains to be done. Researches on the different ecosystems and their reacations and interactions should be investigated in great detail as these aspects would be the deciding factors in limiting production when we go in for large-scale operations. The warm waters of the tropics enable faster growth of the organisms and consequently yield quick harvests. But the same factor, in combination with other changes, could be deleterious causing ecological and biological changes leading to spread of diseases and growth of pests and predators. Intensive culture could cause large-scale disease problems and prophylactic and control measures will have to be developed. In the current stage of coastal aquaculture the input on nutrition is minimal. This is an area of considerable importance and appropriate nutrition technology and cheap production of feed need our immediate attention. Fish genetics is another field requiring initiation of research. The genetic potential of the wild stocks which we are introducing in culture will have to be properly evaluated, preserved and upgraded for providing better yields. The value of monosex culture should be ascertained. Physiological and endocrine control of mobility, feeding, growth and reproduction and adaptation problems need invtisegations.

An aspect of major and immediate concern is the development of hatchery systems for large-scale production of seed of the cultivable organisms at economic levels. Even at this initial stage of development we are faced with the problem of supply of adequate quantities of seed to the culturists. If coastal aquaculture has to develop into an industry production of seed will be the primary need.

Coastal farm engineering would be an area needing the involvement of engineering disciplines. The biologists have had very little interaction with this vital group so far and time has come for developing designs and construction of farms for open-sea and coastal farming for different culture systems and different areas.

Thus we realise that a multi - disciplinary approach is necessary, and it can brook no further delay, to strengthen the technological base for coastal aquaculture. The over-riding factor in the development of the industry would be the costs. We very well know that the Indian consumer cannot pay high prices for the prawns, fishes, oysters mussels etc. as his counterpart in aquaculturally advanced countries such as Japan or the U.S.A. could afford. Our technology should, therefore, be relevant to the set of conditions prevailing in India if a sustained growth of the industry is to be ensured.