



**CENTRAL MARINE FISHERIES  
RESEARCH INSTITUTE  
COCHIN**



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## History & Objectives

The Central Marine Fisheries Research Institute was established in February 1947 by the Government of India directly under the control of the Ministry of Agriculture and Irrigation. The Institute came under the control of the Indian Council of Agricultural Research (ICAR) in October 1967.

The objectives of the Institute are to conduct short term and long term multidisciplinary researches on the marine capture and culture fisheries of the country in order to provide research support for the rational exploitation, conservation and management of the marine and saltwater resources for stepping up production from the coastal water areas and the Exclusive Economic Zone and development support for growth with stability of the industrial, artisanal and culture fisheries through transfer of technology, dissemination of information and education, training and extension.

## Spread of the Institute, and Organisational set-up

The headquarters of the Institute was at Mandapam until 1970 when it was transferred to Cochin. The Institute has at present a Regional Centre at Mandapam Camp and 11 Research Centres at Veraval, Bombay, Karwar, Mangalore, Calicut, Vizhinjam, Tuticorin, Madras, Kakinada, Waltair and Minicoy island. Besides these, the Institute has established 29 Field Centres along the coasts of India for the purpose of collection of marine fish production data and relevant statistics. For specific programmes in mariculture Field Laboratories have been established at Narakkal, Tuticorin, Kovalam and Muttukad.

The various research programmes of the Institute are implemented by 9 scientific Divisions of the Institute. The major functions of the Divisions are outlined as follows:

The Fishery Resources Assessment Division looks after the estimation of All India marine fish production, production means and effort, conducting periodical frame surveys and the running of the National Marine Living Resources Data Centre. Relevant economic aspects of marine capture fisheries and mariculture, socio-economic impact studies and all aspects of marine fisheries extension are tackled by the Fishery Economics and Extension Division. The major functions of the Divisions of Pelagic Fisheries, Demersal Fisheries, Crustacean Fisheries

and Molluscan Fisheries are to monitor the characteristics of the respective commercially exploited resources, their stock assessment, management and conservation measures and the mariculture of fin fishes and shell fishes. The Fishery Environment Management Division is concerned with fishery oceanography, environment studies, remote sensing, marine pollution, seaweed resources and culture and farm engineering. Multidisciplinary researches on physiology, nutrition and pathology of finfishes and shell fishes are implemented by the Physiology, Nutrition and Pathology Division. The Library and Documentation Division looks after book and journal procurement, reference service, reprography and printing of Institute's journal and other publications.

## ACCOMPLISHMENTS OF THE INSTITUTE

### MARINE CAPTURE FISHERIES

#### Potential & Production

Based on limited surveys conducted so far, the fisheries data available and through indirect methods, the Institute has estimated the overall potential fishery resources of the Exclusive Economic Zone of the country as 4.5 million tonnes. A synoptic picture of the tuna resources of the Indian Ocean region, the resources of the oceanic squids, mesopelagic fishes, deep sea lobsters and other related resources have been brought to light.

#### Production means

As against this potential, India is harvesting at present only an average of 1.4 million tonnes of fish per annum, mostly derived from the artisanal and small scale sector. The Industrial sector has made a modest beginning. The Institute has conducted periodical census of the production means and has estimated the total population of marine fishermen as 18.93 lakhs of which 23% are actually engaged in fishing. There are about 1450 fish landing centres along the coasts of India and major fishing harbours have been developed at Diamond harbour, Paradeep, Vishakapatnam, Madras, Cochin and Malpe besides minor fishing harbours at important ports. These have considerably strengthened the base for mechanised fishing by the small-scale and industrial sector. The Institute has set up catch-monitoring units at major fishing harbours. The number of mechanised fishing boats in the country is estimated at 19,000 and non-mechanised fishing crafts at 1.35 lakh units. Of the different gears employed in fishing, drift/gill nets form the major percentage with 2.16 lakhs units.

### Stock assessment of resources

Stock assessment of the pelagic resources such as oil sardine, mackerel, and anchovies have been made indicating their biomass available for exploitation. Resources such as Bombay duck which showed signs of overfishing during the seventies have been closely monitored. The multispecies prawn fisheries which are under heavy exploitation have been studied in detail and the levels of Maximum Sustainable Yield have been indicated for proper management and conservation of the resources. The need for diversification of the effort on other resources has been drawn attention to.

### Conservation & management

The impact of recent developments such as heavy purse seine fishery off Karnataka coast on the spawning stocks of catfishes and other pelagic resources has been carefully evaluated from the point of view of conservation of resources. As regards marine mammals and reptiles, the Institute has taken up head-starting programmes on conservation of endangered species such as sea turtles and the dugong. Data on stranding of whales has been regularly collected. The Institute has also conducted surveys for establishing Marine National Parks,

### Fishery environment

Aspects of fishery environment such as hydrography, primary production, zooplankton biomass,



*Eye-stalk ablation for induced breeding of prawn*

upwelling, specialised ecosystems, marine pollution etc., have been studied in depth to understand their relationship to the fisheries. Modern techniques such as remote sensing and use of satellite imagery are being adapted to estimate the productivity and fishery potential along our coasts.

### MARICULTURE

#### Need & Scope

Realising the fact that the yield from marine capture fisheries in the country has stabilised around 1.4 million tonnes per annum during the past decade and that additional yield would be possible only through costly effort in the non-traditional sector, emphasis is now on mariculture of suitable commercially important species, in the coastal areas and in the open sea.

India's long coastline with lagoons, brackish-water low-lying areas and swamps offer excellent opportunities for mariculture. The Institute has pioneered research efforts in this field and has developed viable low cost technologies for the culture of many candidate species. These technologies, besides augmenting marine fish production also aim at providing employment opportunities to coastal rural population.

#### Traditional System

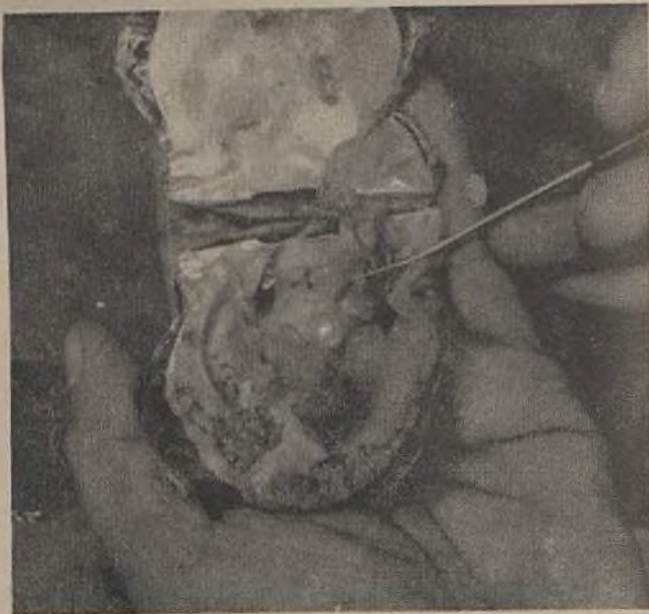
In the Coastal areas of Kerala, Karnataka and West Bengal, already traditional system of aquaculture such as paddy-cum-prawn culture in the 'Pokkali' fields of Kerala and 'bheries' of West Bengal is in vogue. The yield from these traditional practices has been poor. The Institute has developed scientific farming methods to improve traditional system in the backwaters of Kerala which can also be adopted in other areas. These technologies have immediate end use among small farmers, fish culturists and the industry.

#### RECENT TECHNOLOGIES DEVELOPED AT THE INSTITUTE

##### Prawn Culture

Criteria for selection of suitable farm sites, pond lay-out, proper designing of sluices, methods of elimination of predators, selective stocking of desirable species, monitoring growth etc. have been demonstrated for improving the traditional culture practices.

To ensure a steady supply of seeds of quality prawns, hatchery technologies have been developed



*Cultured pearl inside oyster*

at the Prawn Culture Laboratory, Narakkal for the breeding and rearing of prawn larvae to stockable size. Techniques for mass culturing of live feed for the prawn larvae have been developed. In field culture, these improvements resulted in achieving a production rate of upto 602 Kg. / ha / 54 days.

#### Lobster and crabs

Breakthroughs have been achieved in the rearing of lobsters and in the breeding and culture of crabs. These crustaceans have good aquaculture potential in our coastal areas.

#### Fin fish culture

The Institute has also shown that fin fishes such as milk fish, grey mullets, Indian whiting and perches could be profitably cultured through methods such as pen culture, cage culture and culture in polythene lined ponds in beaches with proper management measures.

#### Culture of mussels, oysters and clams

The Institute has established viable technologies for open-sea farming of mussels, farming of edible oysters in backwater and creeks and clam culture in open bays. Both oysters and mussels are now bred in hatcheries and their larvae reared to young ones.

#### Pearl culture

In order to meet the growing demand for cultured pearls within the country and also to explore the possibilities of exporting them, the Institute has developed pioneering indigenous technology for production of cultured pearls. At the inshore farm at Tuticorin, quality cultured pearls are produced through raft culture method. 60 to 70% of the nucleus implanted oysters produce pearls in 3 to 24 months depending on the size of the pearls. Hatchery techniques have now been developed for breeding of pearl oysters and rearing their larvae to young pearl oysters suitable for transplantation to open sea farm.

#### Sea weed culture

Sea weeds are the much needed raw material in the agar-agar, algin and pharmaceutical industry. The Institute has developed simple technology for the culture of commercially important sea weeds. The method involves growing fragments of fresh sea weed introduced on a mesh of coir rope which is kept submerged in the shallow seas. The growth ranges from 4-5 kgs from an initial weight of 1 kg and about 3 harvests can be taken in a year.

#### EDUCATION, TRAINING & TRANSFER OF TECHNOLOGY

CMFRI is keen to transfer its viable technologies in mariculture to different end users. Depending on the level of transfer required, various means are employed. The Krishi Vigyan Kendra at Narakkal provides need-based training to fish farmers and farm women on technologies in prawn and fish culture. A



*Women trainees of Krishi Vigyan Kendra engaged in collection of prawn seed.*

Trainers' Training Centre has been started recently to train managerial and executive personnel interested in mariculture.

Under the Lab-to-Land programme, the actual technologies are carried to the farmer's own field, thus helping them in culture practices with necessary scientific inputs. About 350 families have already been benefited under this programme. Harijans, small farmers and landless labour are the immediate beneficiaries.

Inservice personnel of State fisheries and other departments, scientists of other institutes and teaching staff of agricultural and other universities are exposed to the technologies through the Institute's regular Training programmes and Summer institutes.

Jointly sponsored by the ICAR, UNDP and FAO, a Centre of Advanced Studies in Mariculture has been established at the Institute since 1979. The Centre offers a regular M. Sc., course in Mariculture and also provides opportunities for advanced research leading to the award of Ph. D degree.

#### Consultancy, information dissemination

The Institute renders consultancy service to small farmers, fish culturists, the industry, development agencies and government departments on various aspects of capture fisheries, mariculture and environmental problems. The National Marine Living Resources Data Centre of the Institute has been recognised as the nodal organisation to collect, codify and disseminate all data on fishery resources. Official publications of the Institute such as the *Indian Journal of Fisheries*, *CMFRI Bulletins*, *CMFRI Special Publication*, *Marine Fisheries Information Service*, *Fish Trend* etc., are intended to provide a strong information base for research and development.

*Issued by:*

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