

40 YEARS
OF
RESEARCH AND DEVELOPMENT
IN
MARINE FISHERIES IN INDIA



**A Souvenir issued at the National Symposium on
Research and Development in Marine Fisheries
held at Mandapam Camp, 16 - 18 September 1987, to mark
the 40th Anniversary of
Central Marine Fisheries Research Institute, Cochin
(Indian Council of Agricultural Research)
P. B. No. 2704, E. R. G. Road, Cochin-682 031**

Central Institute of Fisheries Education

ESTABLISHMENT AND FACILITIES

The Central Institute of Fisheries Education (CIFE) is the pioneering Institute in the field of post-graduate Fisheries Education in the country. The Institute was established at Bombay in the year 1961 under the Ministry of Agriculture, Government of India. The administrative control of the Institute has been transferred to the Indian Council of Agricultural Research (ICAR) with effect from 1st April, 1979. The Institute with its Headquarters at Bombay has training centres at Barrackpore (West Bengal), Kakinada (Andhra Pradesh) and Chinhet (Uttar Pradesh).

Besides the training centres, CIFE has a 7.5 ha freshwater fish farm at Balabhadrapuram and an 8.0 ha brackish-water fish farm at Kakinada, both in Andhra Pradesh. At Powarkheda of Madhya Pradesh, CIFE has a 44 ha freshwater fish farm. These fish farms serve as field training centres for the students and trainees, 36.57 metre M. V. SARASWATI, a deepsea going sophisticated research-cum-fishing vessel, and two other trawlers NARMADA AND SUNDARBANS, offer facilities for onboard training and research programmes. The Institute has a well-equipped workshop and a rich library — one of the richest so far as collection of books on fisheries and its allied subjects are concerned.

In view of the international character of oceans and common interest of neighbouring countries, CIFE was shaped to become an area of excellence in higher education in fisheries for the Afro-Asia Region. The FAO of the United Nations actively collaborated with the Govt. of India in organising and developing this Institute for a period of 4½ years from September 1964 to March 1969, providing sophisticated modern equipments for effective instruction in all branches of fisheries science and also expertise of high standard.

OBJECTIVES

The major objectives of the Institute are:

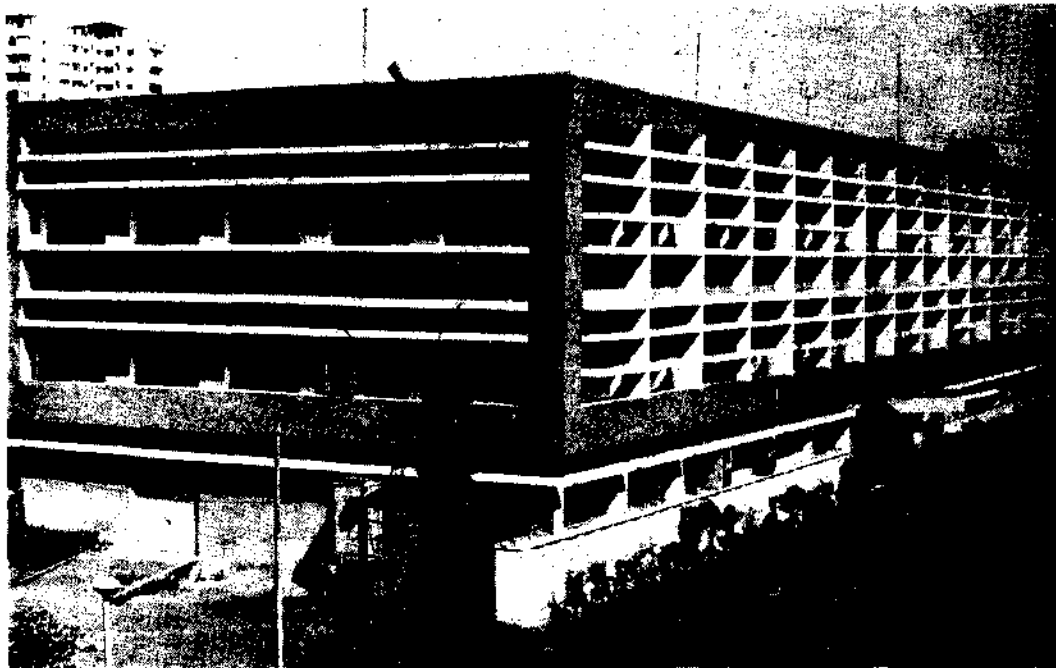
- (a) To conduct under-graduate, post-graduate and doctoral degree programmes and certificate course in fishery science
- (b) To conduct research in basic disciplines, viz. genetics, nutrition, ichthyopathology, reproduction, physiology etc.
- (c) To conduct short-term and long-term training courses in different specialised disciplines of fisheries sciences
- (d) To demonstrate on a limited scale the proven technologies developed by the ICAR fisheries institutes

FUNCTIONS

The Institute conducts specialised courses on all aspects of fisheries besides research and extension. These courses relate mainly to training of personnel of State fisheries departments and fisheries organisations and some sponsored private trainees. The Institute has started a new academic course of 2 years M.Sc. (Fisheries Management) from the academic year 1984-85. The course is affiliated to the University of Bombay. The first course started with 12 students who passed out in 1986, 11 of them securing first class.

REGULAR COURSES DEGREES/DIPLOMAS

	Ann- ual ad- mission	Candi- dates passed	Time of ad- mission
1. 2 years Post graduate diploma in Fisheries Science (D.F.Sc) at CIFE, Bombay Headquarters.	40	693	July



**CIFE
Bombay**

- | | | | |
|--|----|-----|------|
| 2. One-year post graduate certificate course in Inland Fisheries Development & Administration at Inland Fisheries Training Unit, Barrackpore, West Bengal. | 40 | 985 | June |
| 3. 10 months post graduate certificate course in Fisheries Extension at Kakinada, Andhra Pradesh. | 25 | 20 | June |
| 4. 9 months certificate course in Inland Fisheries Operatives at Chinhat, Lucknow, U.P. | 40 | 734 | June |
| 5. M.Sc. (Fisheries Management) 2 years, at CIFE, Bombay, under affiliation to Bombay University. | 12 | .. | |

The Institute is recognised by many Indian universities as a study centre for Masters and Doctorate degrees by research in applied Zoology and Bio-chemistry.

ICAR has agreed in principle to grant a "Deemed University Status" to CIFE. The proposal in this regard is under active consideration of the University Grants Commission, New Delhi.

The Institute organise workshops/seminars/colloquia on the aspects of marine fisheries and its development. So far as extension activities on marine fisheries are concerned, the Institute organise and participate in national exhibitions in a big way sometimes in collaboration with its sister concerns D.O.D., CMFRI, CIFT, MPEDA etc.

ACHIEVEMENTS

EDUCATION AND TRAINING

The Institute has so far trained 2,619 candidates under various courses including 76 candidates sponsored from neighbouring developing countries of Africa and Asia regions.

More than 500 dissertations on different research/developmental aspects including aspects of marine fisheries have been prepared by the trainees towards partial fulfilment of their courses at Bombay, Barrackpore and Hyderabad.

Since her inception, the Institute remained engaged primarily in education. However, after it joined to ICAR in 1979 research and extension became two more important aspects of activities of the Institute. Some of the recent research works in the field of marine fisheries are as follows:

COASTAL ZONE MONITORING OF POLLUTION

Keeping in view the pollution problems, studies on the intertidal macrobenthic fauna of deteriorated mangrove ecosystem off Seven Bungalows, Bombay, were taken up to assess the degree of pollution.

Macrobenthic fauna of mangroove swamps were chiefly consisted of foraminiferans, polychaetes, crabs, pelecypeds and gastropods. Maximum population density 39,685 was of *Potanudes cubgykutys* in the vicinity of mangroove swamps associated with sandy substratum. Percentage of organic matter was more with fine sand.

STOCK ASSESSMENT OF MARINE FISHERIES OF WEST COAST

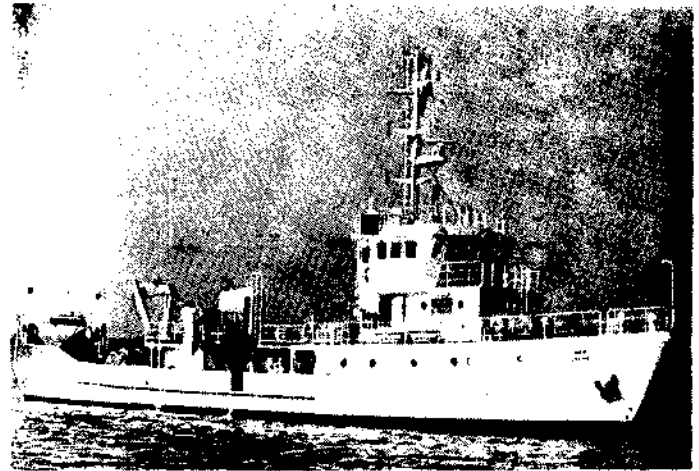
A study of Gonadosomatic Index of *Otolithus argenteus* revealed that the fish has three spawning spouts. The first minor spawning in December-January, the main spawning in May-July and another minor spawning in September-October.

The major forage of *Johnius carutta* has been found to be *Acetes* sp., maximum attainable theoretical weight of 317 g. It grows at an annual rate corresponding to K value of 9.91.

Metapenaeus dobsoni breeds almost throughout the year resulting in almost uniform recruitment into the fishable stock throughout the year.

Average sustainable yield of this prawn is estimated to be 945 tonnes off Quilon during the southwest monsoon period. Effort required is estimated to be 334 trawlers operating 8 hours per day during the monsoon season.

Coilia dussumieri attains theoretical maximum length of 285 mm and weight of 30 g. This stock is found to suffer a natural mortality of 1.3 (M) and fishing mortality of 1.7 (F) and the yield (weight) per recruit is only 3.1 g.



M.V. Saraswathi



Training in fish processing



Oceanographic training on board
M.V. Saraswathi



Prawn hatchery development training

MELANOSIS OF PRAWN

Black-spotted prawns caused by the action of the enzyme poly-phenalase oxidase (PPO), called "Melanosis", are frequently encountered in prawn landings of Bombay during monsoon.

The Institute has worked out PPO enzymes in Penaeid prawns like *M. affinis*, *M. brevicornis*, *P. monodon*, *P. hardwicki* and *Solenocera crassicornis* and non-penaeid prawns like *Acetes indicus* and *Poleomon tenuis*. Measures for prevention of Melanosis have been suggested.

LIVE AND FORMULATED FEED FOR PRAWN LARVAE

Intensive culture of zooplankton viz. Moina, Brachionus, Daphnia, *Fabrea salina* (not reported earlier from India) and Artemia were undertaken and their efficacy as live feed have been tested. Cheap and efficient method for culture of these organisms utilising commonly available animal waste have been evolved. Biology, ecology and optimum conditions required for raising the crop of Artemia have been intensively studied and a system has been developed to maintain a continuous mass culture of the animal to feed prawn larvae in the hatchery system.

Side by side a number of cheap feed viz. Acetes suspension, squilla and egg custard have been tried and formulated from abundantly available cheap raw material.

SOCIO-ECONOMICS STUDY OF ROLE AND STATUS OF FISHERWOMEN

The socio-economic conditions of fisherwomen of Versova village with special reference to their role and status were studied. The study revealed that the fisherwomen of Versova assist their family members, earn income through fish sales, participate in decision making and take care of their families. Majority of women were satisfied with their present role in the family and did not like to disturb their role of a happy housewife by taking a more active part in income generation.

SHOREWARD MOVEMENT OF LOW OXYGEN LAYERS

Data collected at fish landing centres of Bombay indicated that high catch of marine prawns, *P. merguensis*, *P.*

indicus, *Solenocera indica* and *Acetes* spp. are landed during monsoon. Hydrobiological studies by M.F.V. SARASWATI had confirmed the high catch due to the effect of monsoon season. Associated with this oceanographic phenomenon, the prawn populations migrate inshore and yield high catches.

This finding adds new dimension to the management of prawn catch from coastal areas and hence calls for a review of policy for coastal fishing during South West monsoon months in the Maharashtra coastal region and a major research project for indepth study of the problem.

DEEP SEA FISHING

The results of exploratory fishing of M.F.V. SARASWATI have indicated that the fish abundance during monsoon and post-monsoon months off Maharashtra coast in the deeper waters of 100-250 m depth is low due to low oxygen.

NEW BUOYANCY TESTING METHOD

CIFE has introduced a simple method of calculation of buoyancy of floats for the demonstration of the system to the trainees. This facility is now being used as a teaching aid.

HIGH OPENING TRAWL FOR FISHING SHRIMP

The Fishery Technology Division of CIEF has initiated a project on high opening trawls. Three new designs of high opening trawls were fabricated and put to test by comparative fishing along with 21 m traditional shrimp trawl from 38 feet vessel M.F.V. NARMADA.

Among the three designs, 20.70 m high opening two seam shrimp trawls has given better results during comparative fishing experiments. 20.70 m high opening trawl landed 1.82 times more catch than the traditional 21 m.

COMPUTERISING MARINE RESOURCES AND OCEANOGRAPHIC DATA

Software for data documentation and analysis has been developed for fisheries resources survey data. The exploratory survey by deep sea going research-cum-training vessel SARASWATI is generating scientific data on fish catch and environment. This basic raw data is quality-checked, processed

and documented, using a Microcomputer HCL-WORKHORSE LEVEL-3B in four standard schedules covering haul-wise catch, species composition, environmental data and length/weight sampling of catch. The detailed processed data provides information on fisheries resources of a selected area in the EEZ. Normally processing of raw fishing data used to take about a year or more for dissemination. With computerisation it is now done within a fortnight after the completion of cruises which is very helpful for investment planning in marine fisheries by the fishing industry and for formulating joint ventures.

PRODUCTIVE UTILISATION OF COASTAL SANDY BEACHES

Soils of beaches around metropolitan cities are rich in organic contents. In Bombay cultivation of Methi (*Trigonella foenum-graecum*) which is a green vegetable, prevails. Beach soil is sandy with 1-3% organic matter and is suitable for methi cultivation of short duration. Poor families of the working classes have been cultivating Methi all along the beaches for their livelihood. The crop gets ready within 7 days. A family earns Rs. 150-200 per day from this short duration crop.

EXPLORATORY FISHING/TRAINING/RESEARCH ON BOARD VESSEL M.F.V. SARASWATI

Till the end of 1986, M.F.V. SARASWATI the deep sea going 36.5 meter research cum training vessel of CIFE has conducted 50 cruises, spread over 385 days on training demonstration and research programmes. In all 640 personnel of CIFE, DOD, CIFT, CMFRI and the fisheries departments of Goa, Karnataka, Maharashtra, Gujarat, teachers sponsored by N.C.E.R.T. and research scholars of Maldives, participated in the cruises.

During her cruises, new productive fishing grounds have been located. Identification, biology and population dynamics of some of the fishes have been studied intensively and their stocks assessed. Physico-chemical changes along north-west coast of India in relation to fisheries have been studied with a view to understanding the fluctuations in catches of some commercially important fishes.



**Methi cultivation
on beach**

UTILIZATION OF LOW PRICED FISH

The Institute demonstrated successfully better and effective utilisation of low value fish by developing fish wafers, fish kheema, dried laminated bombayduck, smoked mackerel, eels, etc. and conducted training programmes on these aspects.

EXTENSION ACTIVITIES OF MARINE FISHERIES DEVELOPMENT

Keeping the national priorities in mind the Institute organised workshops/seminar on multiuse of coastal zone in 1976 and on management of marine living resources within the Indian EEZ in December 1981. A training programme exclusively designed to cater to the needs of coastguard personnel was also organised by the Institute. The facility of the vessel was extended to the maritime states and the different fisheries organisation under ICAR (CMFRI, CIFT) to cater to their needs. Studies have also been made on particular aspects of economics of fishing operations including wages and wage structure, marketing margins, cooperatives etc. along the Maharashtra coast. Socio-economic conditions of the fisherwomen and their role in fishing industry have also been made.

Recognising the role played by the Institute in human resources development in fisheries, the Commonwealth Secretariat, London, sponsored an Aquaculture Training for Africa/Asia region to train the middle level managers in Aquaculture in developing their skills in management of fish farms. The programme conducted by the Institute during June-July, 1983, was so designed that the knowledge acquired and experience gained by them in India could stand in good stead for development of aquaculture in their respective

countries. Participants were drawn from Bangladesh, Sri Lanka, Zambia, Gambia, Sierra Leone and Egypt.

The Institute has also gone in for active participation in national and international exhibitions and fairs not only to create awareness but also to propagate various technologies developed by the Institute, as was done at the exhibition "Ocean & its Resources" held at New Delhi on November 14, 1983, highlighting the opportunities to rural youth in aquaculture. It has also organised seminars and workshops all over India like "Aquatic conservation and Angling" at Pongdam H.P. (1984) "Coastal Aquaculture" at Cochin, "Mass Awareness Convenient" at Durg, M.P. (1986) etc. The Institute is also utilising mass media from time to time in propagating the technologies. The programme entitled "In search of Fish" on the activities of the Institute modern vessel M.V. SARASWATI produced by Bombay Door-darshan was also telecast on a couple of occasions. The impressive achievements of the Institute during the last quarter of a century were largely made possible by the active cooperation and assistance of the concerned State Governments and national and international agencies. The Institute can take pride in that the alumni of this Institute had occupied and a number of them continue to occupy pivotal positions in fisheries development in India and neighbouring developing countries like Nigeria, Fiji, Sri Lanka, Indonesia and Sudan. Also some of the former staff members of the Institute are today highly placed in the Institute and are on the advisory panel of recognised national and international organisations connected with fisheries management and development. They also act as experts for evaluation of projects formulated by financial and development organisations. CIEF has enormous responsibilities in fulfilling the national priorities and meet the requirements in Human Resources Development in Fisheries at national and international levels.

*Communicated by Prof. Y. Sreekrishna, Director, CIFE,
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