



भाकृअनुप
ICAR

Technology in service of fisheries development

CENTRAL INSTITUTE OF FISHERIES TECHNOLOGY
(Indian Council of Agricultural Research)
MATSYAPURI P.O., COCHIN-682 029



A Profile

HISTORY

The Central Institute of Fisheries Technology was set up in 1957 following the recommendations of a high power committee constituted by the Ministry of Food and Agriculture, Government of India. It started functioning at Cochin in 1957 under the Department of Agriculture of the then Ministry of Food and Agriculture with a small nucleus of staff for research work in fishing craft and gear. The Processing Division of the Institute was started in 1958 and the Extension, Information and Statistics Division in 1961. The administrative control of the Institute was brought under the Indian Council of Agricultural Research from 1st October, 1967 to provide more autonomy in functioning.

The Institute is the only National Centre in the country where research in all disciplines relating to harvest and post-harvest technologies of fish is undertaken. Research Centres function at Veraval (Gujarat), Visakhapatnam (Andhra Pradesh), Burla (Orissa), Hoshangabad (Madhya Pradesh), Mumbai (Maharashtra) and Calicut (Kerala) to cater to the regional needs and for solving location specific problems.

MANDATE OF CIFT

1. To evolve innovative, cost-effective technologies for fish harvest.
2. To develop and standardize various aspects of post-harvest technologies.
3. To develop technologies for extraction of biomedical, pharmaceutical and industrial products from aquatic organisms.

4. To act as a repository of information on harvest and post-harvest technologies with a systematic data base.
5. To conduct transfer of technology through training, education and extension education programmes.
6. To provide consultancy services and to popularize the innovations for the overall development of fishery industry.

ORGANISATION AND STRUCTURE

The Director is the head of the Institution. With him are vested all administrative and financial powers regarding research and management of the Institute. He is assisted by the Heads of various Scientific Divisions in carrying out the research and development activities of the Institute. He is also assisted by a Senior Administrative Officer for dealing with matters relating to general administration and an Assistant Finance & Accounts Officer for looking after financial accounting aspects as also internal audit of the institute. A Technical Section attends to the technical matters including those connected with research projects handled by the Institute at its Headquarters at Cochin and Research Centres. An Official Language Section monitors the official language policy in the Institute and caters to the requirements of the Institute for bringing out its reports and publications in Hindi.

Research work of the Institute is carried out in the following Scientific Divisions:

1. Fishing Technology Division
2. Fish Processing Division
3. Quality Assurance & Management Division
4. Biochemistry & Nutrition Division

5. Microbiology, Fermentation & Biotechnology Division
6. Engineering Division
7. Extension, Information & Statistics Division

The scientific manpower of the Institute is at present 80.

INFRASTRUCTURE

Building

The Headquarters at Cochin and the Research Centres at Veraval, Mumbai and Visakhapatnam are housed in their own buildings. The Calicut Research Centre is housed in a portion of a building owned by Central Marine Fisheries Research Institute. Burla and Hoshangabad Centres still function from hired accommodation.

The Institute has its own residential quarters for its staff at Cochin and Visakhapatnam. A modern guest house with capacity to accommodate thirteen persons has also been constructed and made functional at the residential quarters complex at Cochin.

Laboratories

The Institute is well equipped with laboratories for both fundamental as well as applied research. The Biochemistry, Microbiology and Fishing Craft laboratories are well equipped with all modern analytical instruments for undertaking fundamental research whereas the Processing, By-products, Quality Assurance and Fishing Gear laboratories lay greater emphasis on applied research. The Instrumentation laboratory is engaged in development of new electronic aids in fishing, fish processing and related activities.

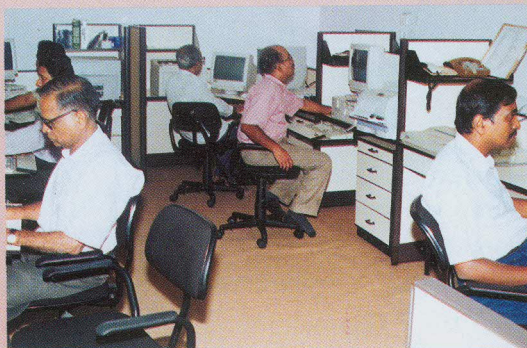
The Scientific as well as administrative activities of the Institute are computerised to a satisfactory level. Modern communication

and information facilities like telephone, telex, fax, internet etc. are also available at the Headquarters and Research Centres.

All the Research Centres have also been provided with the basic laboratory facilities commensurate with their needs in fulfilling the mandates assigned to them.

ARIS Cell

An ARIS Cell functions from the Institute. It serves as a central facility for EDP and information retrieval. A VSAT is installed and a UNIX SOLARIS server



ARIS Cell

configured for Internet and e-mail facilities. A Local Area Network using Windows NT and Proxy Server is used to share the Internet and e-mail facilities.

Pilot Plant

The Headquarters at Cochin has facilities for translating some of its technologies to pilot plant scale. Important among them are the pilot plants for chitin/chitosan, battered and breaded fish products, canned products and fish feed.

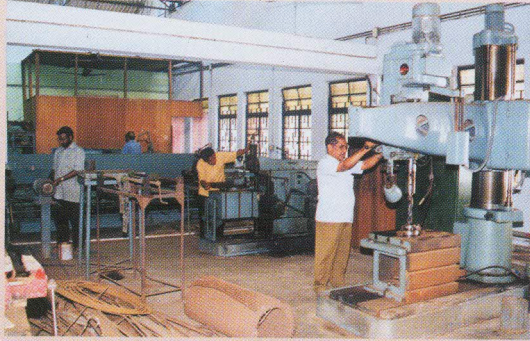
Fishing Vessels

CIFT is the pioneer in the designing of fishing vessels in India. It has over 23 designs to its credit and prototypes of many of these designs have been constructed in the Institute itself and used for research purposes both at the headquarters and Research Centers. Over 91% of the commercial fishing fleet is built to these designs. A recent addition to these designs is that of a fuel efficient

steel trawler (15.5m) which has received a lot of appreciation from fishing boat builders and boat operators.

Engineering Workshop

CIFT has a well equipped engineering workshop at Cochin where fabrication of the ancillary equipment required as fishing accessories and many of the fabric-



Engineering workshop

ation needs for construction of fishing vessels are being carried out. The workshop has all facilities including a lathe and well experienced and qualified technicians of all trades.

Animal House

With several new species of fish being harvested from the oceanic and deep sea waters, the Institute has the responsibility to assess the edibility, nutritive value, probable



Animal house

toxicity etc. of the new species. The Institute's routine work also involves assessment of these factors with fresh and processed fish and fish products. An Animal House to meet the Institute's needs in these respects is maintained at the Headquarters.

Vehicles

The Institute maintains an adequate complement of vehicles to support its research needs, field works etc. Each Centre is also

provided with a jeep. The Headquarters maintains a fleet of seven vehicles including staff car.

Library

The Institute has the main library at the Headquarters at Cochin while the Research Centres have small libraries to cater to their immediate needs. The Headquarters library subscribes to periodicals, both Indian and foreign. It has access to ASFA (Aquatic Science and Fisheries Abstracts) and FSTA (Food Science and Technology Abstracts) CD ROMs which has considerably improved its capacity to provide information on fisheries research and development to those who need the same.

IMPORTANT TECHNOLOGIES DEVELOPED BY THE INSTITUTE



*Sagar kripa - the 15.5m fuel efficient
steel fishing vesesel*

- Designs of twelve wooden fishing vessels in the size range 7.6 m - 15.2 m
- Designs of steel fishing vessels viz. 15.5 m, 20 m and 24 m OAL.
- Designs of aluminium craft for inshore waters and FRP pole and line fishing vessels for Lakshadweep.
- Dual preservative treatment for low valued species of timbers for boat construction and formulation of indigenous preservatives for traditional fishing craft.
- Painting schedules for aluminium magnesium alloy and FRP sheathing for under water hulls of fishing vessels
- Development of toxic wood plastic composites (TWPC)

- Antifouling and anticorrosive paints for protection of fishing craft
- Mercury free anodes for cathodic protection of fishing craft



FRP canoe

- Protective coating for cast iron propeller
- Specifications for different types of synthetic materials for fabrication of different types of fishing gear.
- Designs of different types of fishing gear such as trawls for demersal, pelagic and semi-pelagic applications, gill nets, purse seines, traps etc. for exploitation of the different fishery resources including reservoir fisheries
- Otterboards of different sizes and designs to suit demersal trawl fishing operations and variable depth fishing
- Combination wire rope for deep sea fishing
- By-catch reduction devices -

- 1) square mesh panel of 40, 50 and 60 mm mesh size
- 2) fish eye - for reduction of by-catch especially juveniles and young ones in shrimp trawls



V-form otter boards

- Design fabrication and popularization of Turtle Excluder Device (TED)
- Acoustic detection and aimed mid-water trawling technique developed for Antarctic krill during first Indian Antarctic Krill Expedition
- Designs of dryers like tunnel dryer, rotary fish meal dryer, electrical fish dryer for cottage scale operation



Turtle excluder device

- Designs of deep fat fryer, cutlet moulding machine, inboard/outboard drive, electro thermal smoke kiln, mechanised processing table, mechanical fish cleaner for spratts
- Fuel efficient propeller for fishing vessels
- Other fuel saving devices like propeller nozzle
- Electronic instruments for agriculture and marine sciences
- Biogas plant from water hyacinth
- Fishing accessories like trawl winch, power-take-off clutch, gurdy etc.
- Refrigerated sea water plant of 150 kg capacity
- Design of shark liver oil/fish oil plant to handle 1000 kg raw material per day
- Specific requirements in setting up fish processing plants
- Improved methods for freezing, freeze drying, canning, drying/ curing different types of fish and shell fish
- Hygienic drying of anchoviella on raised platform

- Cleaning schedules for fish processing establishments and boat decks and preparation of deodorant and antiseptic ointment
- Method for economic utilization of low grade fish and conversion of fish wastes into useful by-products
- Methods for production of value added products like wafers, pickles, soup etc. from fish/shell fish
- Chlorine level indicator paper for instant reading of chlorine level in water used in fish processing plants
- Specifications for various types of seafood, process water and ice for food processing

- Procedure for implementation of HACCP



Cloritest - the chlorine level indicating paper

- Methods for extraction of chitin/chitosan from prawn shell waste and their application in textile and poultry industry and in the medical field : pilot plant for production of chitosan

- Method for the preparation of glucosamine hydrochloride

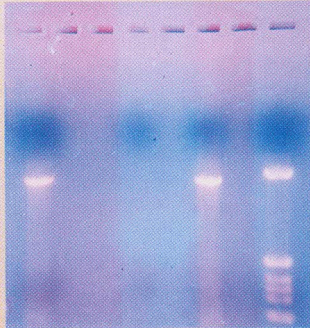
- Method for extraction of shark fin rays and processing shark cartilage



Chitosan plant

- An 18 h depuration method to eradicate pathogenic bacteria and grittiness from bivalves, especially clams and mussels

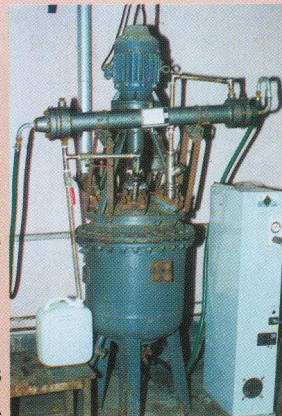
- Collagen chitosan film from fish skin, bone and air bladder for application in treatment of burns and as a barrier material in guided tissue regeneration (GTR) in dentistry
- Fine grade absorbable surgical sutures from fish gut
- Bacteriological culture media for 1) direct detection and enumeration of the potent spoiler bacterium *Alteromonas putrefaciens* and 2) estimation of total plate count of cured/semi preserved/salted fishery products by preventing swarming of *Bacillus* sp
- Method for detection of faecal contamination by using coliphages



Detection of white spot syndrome virus in shrimps using PCR technique

- Method for detection of white spot disease in farmed shrimp using polymerase chain reaction (PCR) technique.
- Method for isolation of squalene from shark liver oil for use in cosmetics

- Method for preparation of n-3 polyunsaturated fatty acid concentrated from fish oils
- High gel strength agar from sea weeds
- Formulation of standards for various fish products for Bureau of Indian Standards
- Device for drawing uniform samples from frozen fish blocks for microbiological evaluation



Scaled-up unit for production of PUFA

- Effluent treatment for fish processing plants
- Improved packaging materials for transportation and storage of fish
- Development of a software for HACCP in seafood quality

ASSISTANCE TO THE INDUSTRY

The Institute has been maintaining close liaison with the fishing and fish processing industry of the country. All the technologies, which have been developed by the Institute and described above are commercially viable.



Consultancy being offered

They are ready for transfer for industrial

application on consultancy basis.

Besides, the CIFT has been serving the industry by offering analytical services in respect of industrial products concerned with fishing / fish processing.

Analytical services available for:

- Canned fish products
- Frozen fish products
- Dried fishery products
- IQF products
- Chitin / Chitosan
- Other fish by-products
- Fish speciality products



Analysis in progress

- Pasteurised products
- Water and ice used in processing plants
- Fish glue
- AFD products
- Chemicals
- Agricultural products
- Antibiotic and pesticide residues in fish and fishery products, process water and farm water
- Packaging materials
- Sanitary survey
- Gear materials
- Craft materials
- Marine paints
- Marine engines

EXTENSION SERVICES

One of the main activities of the Institute is catering to the needs of the industry by dissemination of research



Trainings underway



results to the actual end users. The single window

approach in the transfer of technologies followed by CIFT achieved by answering technical queries, supply of designs and publications, arranging exhibitions and film shows, issue of technical pamphlets, folders and booklets, arranging press releases, conduct of training programmes etc. is highly effective in reaching the clients.

HRD IN FISHERY TECHNOLOGY

Need based training and demonstration programmes are organised for different categories of clients such as technical personnel from the fishing and fish processing industry, officials from Government organisations, personnel sponsored by the non-government organisations, new entrepreneurs and the weaker sections like fishermen and fisherwomen.

The Institute also offers opportunities to its staff for training, participation in symposia / seminars and attending educational programmes, both at national and international levels in important areas of research and development.

FISHERIES EDUCATION

CIFT has been recognised by Kerala University, Cochin University and Jadavpur University for purpose of post-graduate research. It provides educational facilities for Master's programmes in Industrial Fisheries conducted by School of Industrial Fisheries, Cochin University and the Mariculture P.G. course conducted by Central Marine Fisheries Research Institute, Cochin. A M.F.Sc course in Post Harvest Technology with affiliation to CIFE, Mumbai is functioning at the Institute. Recently, Doctoral programme in Post-Harvest Technology has also been started.

LINKAGES

The Institute maintains close linkages with Union and State Government Departments, other ICAR Institutes, Universities, Non-

Governmental organisations, Fishermen bodies engaged in development of the fishery sector and international peer organisations engaged in fishery related investigations.

The Institute is associated with the formulation of quality standards for the Bureau of Indian Standards and their periodical updating. Similarly, the Institute is playing leading role in the Inter Departmental Panel (IDP) and Supervisory Audit Team (SAT) constituted by the Govt. of India for the purpose of approval of fish processing plants exporting fish products to EU countries.

The Scientists of CIFT have played a pivotal role in solving problems related to certain social and environmental aspects. Some of them are:

- Study undertaken for the Goshree Island Development Authority, Cochin on effect of dredging, reclamation of land and construction of bridges on the water and soil characteristics of the Vembanad lake, its flora and fauna.
- Report submitted to Legislative Committee on Environment, Govt. of Kerala on mass fish kill in Periyar due to industrial pollution.
- The seafood processing plants in India have to adopt lots of modifications in terms of processing facility, raw material quality and hygiene as per the new EU regulations. Since CIFT has all the relevant facilities and expertise needed for effecting these modifications, the Govt. of India has entrusted the Institute with the processing plant inspection, water, ice and raw material certification and inter-laboratory calibration.

The Scientists of the Institute are also very often called upon to deliver lectures at various training programmes, seminars, workshops and symposia organised by Universities, NGOs, State and Central Government organisations, educational institutions etc.

Laurels for CIFT

The Institute was the proud recipient of the Sardar Patel Outstanding ICAR Institution Award 2000. The award was given in recognition of the contributions made by the Institute in the field of harvest and post harvest technology of fish.



Director, Dr. K. Devadasan receiving the Best Institute award



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