

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
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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 Technology

ESTABLISHMENT AND DEVELOPMENT

In the year 1954 the Ministry of Food and Agriculture, Govt. of India appointed a high power committee to consider steps to be taken for achieving overall development of fisheries industry in the country. Following the recommendations of the Committee, the Institute came into existence at Cochin in December 1957 under the Department of Agriculture, Ministry of Food and Agriculture, as Central Fisheries Technological Research Station, with a small nucleus of staff for research in fishing craft and gear. The processing technology research cell which was initially a part of CMFRI was transplanted from there in the year 1958 into this newly created organisation to form the processing wing of the Institute. The Institute acquired its present name in the year 1962.

Since the time of its inception, the Institute has undergone notable progress and made considerable expansion of its staff and facilities. The headquarters of the Institute is housed at Cochin with the following divisions:

1. Fishing Craft Division
2. Fishing Gear Division
3. Fish Processing Division
4. Fish Biochemistry & Nutrition Division
5. Fish Microbiology Division
6. Engineering & Instrumentation Division
7. Extension, Information & Statistics Division

It also established sub-stations and units in representative localities in different parts of the country to cater to the specific regional needs. Substations were set up at Veraval (Gujarat) in 1962, Kakinada (Andhra Pradesh) in 1962 and Burla (Orissa) in 1963 and Units at Bombay (Maharashtra)

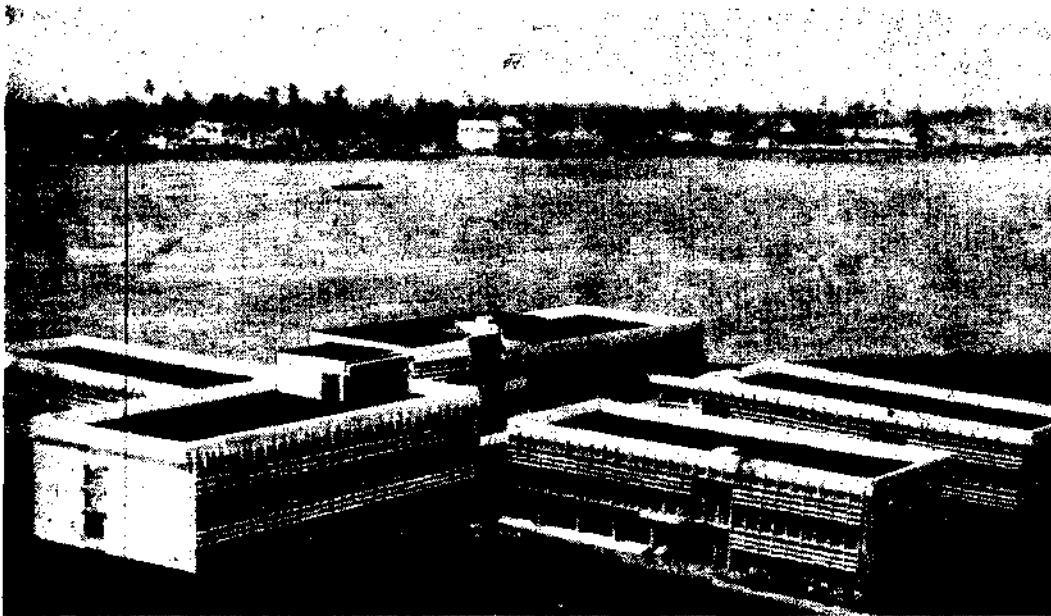
in 1958, Calicut (Kerala) in 1962, Nangal (Punjab) in 1964, Panaji (Goa) in 1965 and Madras (Tamil Nadu) in 1972. The Unit at Nangal, having successfully completed the work assigned to it, was closed down in 1970. The Madras Unit was also wound up after having existed two years.

The Administrative control of the Institute was transferred to the Indian Council of Agricultural Research in October 1967. The Institute moved into its permanent building at Willingdon Island, Cochin, in June 1976 on its formal inauguration by the then Union Minister of Agriculture, Shri Jagjeevan Ram. The Institute is presently the only National Centre in the country where research investigations in all the disciplines of fishing and fish processing technology are undertaken.

AIMS AND FUNCTIONS

The activities of the Institute are oriented towards fulfilment of the following objectives:

1. Research and development work for increased marine and inland fish production by evolving suitable designs of fishing craft and gear and fish-catching techniques, optimum utilisation of fish catch and waste products, introduction of substitutes for imported machines and equipments needed for the fishing industry and its ancillaries.
2. Training of personnel required by the fishing industry.
3. Extension of useful research findings to the actual users throughout the country.
4. Extending facilities for post-graduate research leading to higher degrees.



**CIFT
Headquarters
Cochin**

ACHIEVEMENTS

Since its inception, the Institute has taken up and successfully concluded studies on many important aspects of fishing and fish processing industry. Some of the significant results are given below.

FISHING BOATS

Twelve designs of fishing boats in the size range 7.67 m to 15.24 m have been released. More than two-thirds of the mechanised fishing fleet in the country are built to these designs. Haldu and mango wood were found to be cheap and significant substitutes for the conventional and costly timbers like Teak and Aini in the construction of fishing boats. Copper oxide paints were adjudged to be 30% cheaper than corresponding commercial paints for use against marine corrosion and fouling in fishing boats. Ferrocement has been found to be an economical substitute for steel in the construction of medium and small-sized vessels. Marine grade aluminium has been found satisfactory to replace costly copper for sheathing wooden hulls of fishing boats. Chemical wood preservatives like creoscor, copper creosote and arsenical creosote were

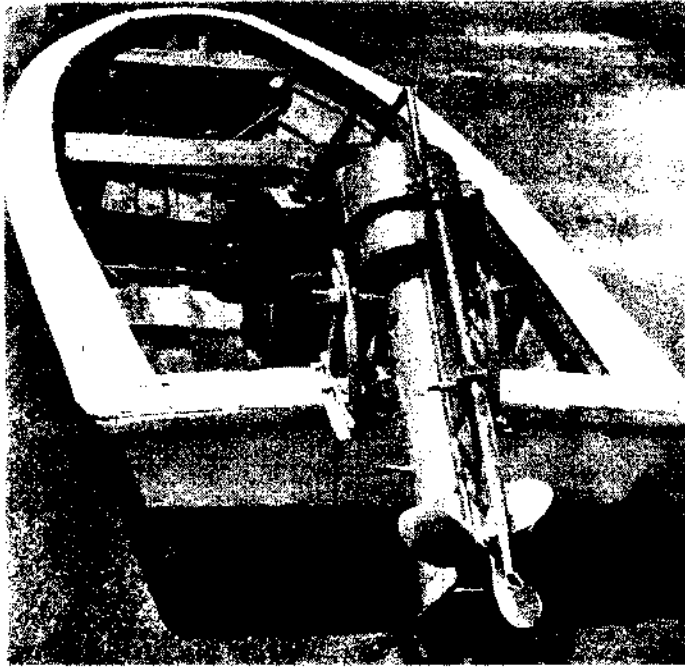
found to be effective in protection of indigenous fishing craft. A galvanic anode free from mercury has been developed for use in cathodic protection of fishing boats and metallic marine structures. The life of these anodes is 3 times that of the conventional zinc anodes.

FISHING GEAR

Synthetic twines have replaced cotton twines for fabrication of trawls. A number of improved designs of fishing gear like bulged belly, long wing, parallel twin body trawl, etc and new methods of fishing like double rig and twin rig shrimp trawling have been found to yield higher catches than the conventional ones. Introduction of the mini purse seine for operation from country craft has offered a welcome change from the traditional gear mainly used for catch of pelagic shoaling fishes. The new lobster trap developed at the Institute has longer life and a double fold catching efficiency when compared to the traditional traps used at present for lobster fishing.

FISH PROCESSING

Methods have been developed for freezing and canning of different varieties of fish and shell fish, preparation of good quality cured fish and shell fish, production of byproducts like chitin, chitosan from prawn shell waste and fish ensilage,



Indigenous boat fitted with inboard engines having outboard drive

poultry feed and fish feed from filleting wastes, extraction of shark fin rays, and specially products like fish soup powder, fish wafers, fish pickles, edible fish powder, etc from miscellaneous fish and shell fish. Other achievements include conversion of mussel shell wastes into good quality quicklime, process for dehydration of jelly fish, a hitherto unutilised marine species, conversion of fish collagen into good quality surgical sutures, development of deodorant and antiseptic ointment for use in the processing laboratory and development of the chlorine level indicator paper for instant reading of chlorine level in water supplies.

FISH BIOCHEMISTRY AND NUTRITION

The fatty acid composition of many of the important fishes have been determined as also the changes in major protein fractions of commercially important fish during storage in ice and in frozen condition. Biochemical composition and nutritive value of edible portions of major food fishes were worked out. Red meat of scombroid fishes was found to be richer in fat, sugars and minerals. Studies conducted on albino rats showed that fishoil rich in poly unsaturated fatty acids could bring down the cholesterol level significantly.

FISH MICROBIOLOGY

Studies have been carried out on the quantitative and qualitative aspects of the bacterial flora in fish and shell fish. Studies on the use of antibiotics in preservation of fish have revealed its definite advantages where fish have to be stored for more than a week in ice. An improved method has also been evolved for isolation of salmonella organisms from seafoods.

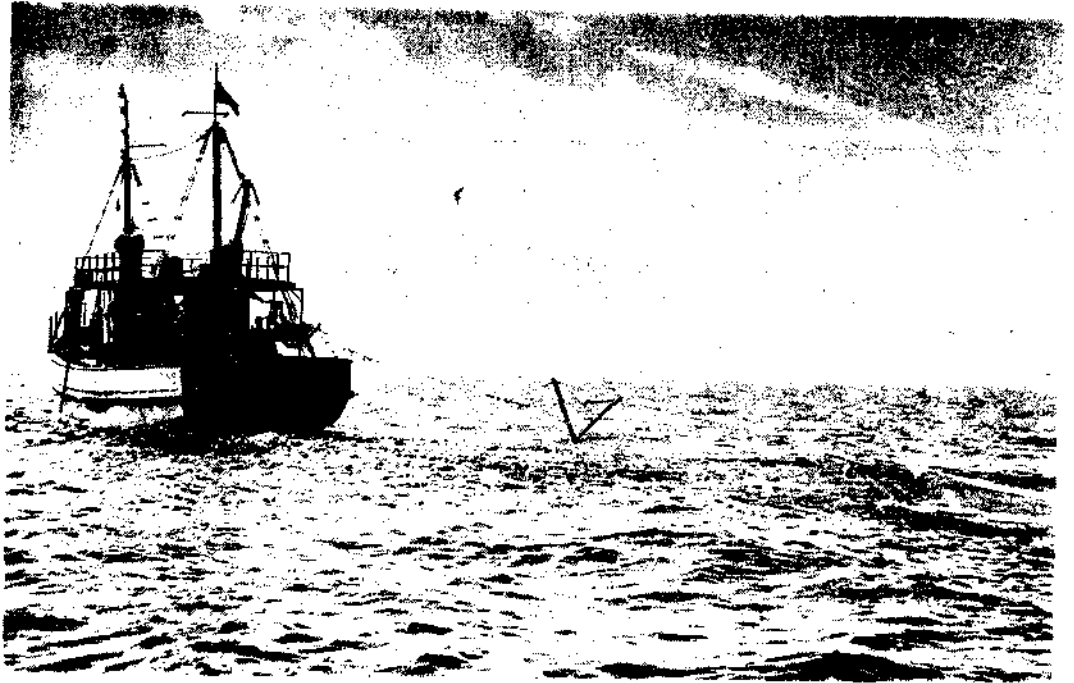
ENGINEERING AND INSTRUMENTATION IN FISHING TECHNOLOGY

Designs have been developed for fishing accessories like winches, gurdy, jockey-pulley, line hauler, fish dryers like tunnel dryer, rotary drum dryer and solar dryer, and other machineries like deepfreezer, refrigerated seawater plant, automatic grading machine, etc. Also deserving mention is the inboard/outboard drive for propulsion of country craft, pro-



Better quality lobster traps to replace the less efficient conventional ones

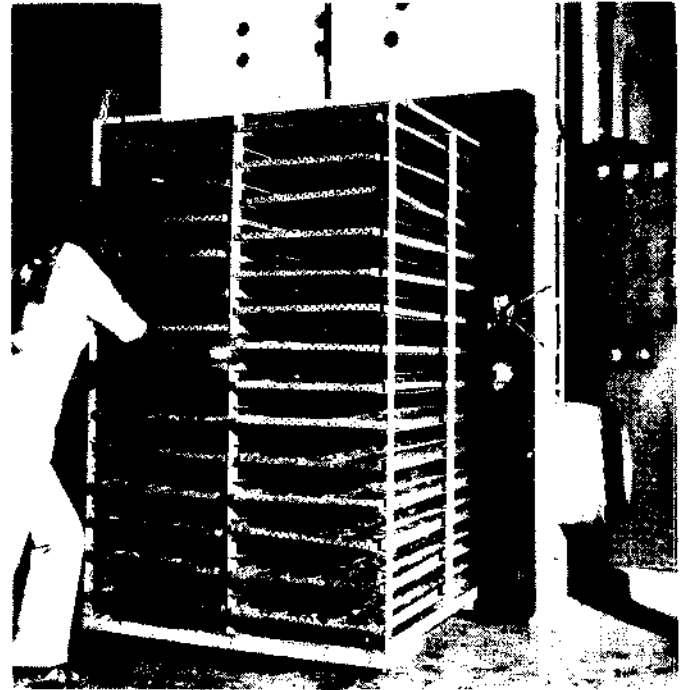
12.5 metre
combination vessel
for trawling



Mini purse seine
operating from
traditional craft



**One-tonne
tunnel dryer**



pellor cover for effecting decrease in fuel consumption, the electro-thermal smoke kiln, a modern hearth for boiling clams involving less fuel and less time when compared to the conventional method, and an electric apparatus for painless killing of frogs.

More than 30 electronic instruments have been developed for use in fishing operations, fishing-gear testing and standardisation and in fish processing industry. Some of them are the salinity temperature depth meter, digital current meter, fish activity recorder, electronic warp load meter, trawl depth meter, mesh distortion telemeter, angle of attack meter, net flow meter, multisignal data acquisition system, brine concentration meter, automatic brine dispenser, moisture meter, universal marine telemeter, etc.

FISHERIES EXTENSION AND STATISTICS

Studies have been conducted on the economics of operation of CIFT-design fishing vessels, extent of wastage occurring at different stages of processing and rates of turnover of work at various stages of production, idle capacity of fish processing plants in India, optimum number of trawlers for Kerala coast, and sampling plan for pre-packed fishery products.

As part of its extension activities, the Institute has answered so far more than 10000 technical queries received from all over the world and given training to more than 300 technical personnel in various aspects of fishing and fish processing. It has also conducted a number of demonstrations, exhibitions and film shows and tested a large number of raw materials and fishery products. It brings out a quarterly entitled 'Fish Technology Newsletter', apart from publishing the Annual Report, Special Bulletins and pamphlets in English, Hindi and other regional languages.

FUTURE PROGRAMMES

Programme envisaged for coming years includes:

Studies on behaviours of potentially important boat-building materials like plastic composites, vulcanized rein-

forced rubber, cupro-nickel, etc. More emphasis on protection of indigenous marine fishing craft by improved wood preservatives. Development of suitable gear and methods for exploitation of hitherto unexploited deepsea resources. Greater emphasis on evolution of gear suitable for exploitation of inland water resources. Diversification of products to cater to needs of the rural poor and sophisticated urban population.

Intensified work on post-harvest technology pertaining to freshwater and brackishwater fish and improvement in preservation and storage of dried fish. Production of intermediate moisture foods and development of suitable food grade lacquers for fish cans. Comparative studies on nutritional qualities of different fish and shell fish and various fishery products and isolation of biologically active extractives like insulin from fishes. Studies on viruses and mycotoxins in seafoods and on characterisation of bacterial isolates from marine, brackish and freshwater fish in relation to spoilage and safety. Process control to improve quality of seafoods, improvement in quality and shelf life of frozen products and incidence and sources of contamination of fishery products with *V. cholerae*.



**Creoscor and copper and arsenic
Creosotes do well as wood
preservatives on country craft**

Development of suitable packagings for various fishery products and cheaper containers including flexible pouches and aluminium containers in place of conventional tin cans. Application of cryogenics in freezing and transportation of fish and use of non-conventional energy sources for the fish processing industry. Designing and operation of pilot plants of processed fish products to study their commercial feasibility. Prototype construction of various electronic instruments and their field testing. More emphasis on extension of various activities/technologies developed to rural areas and fishing villages by organising village level training. Studies on consumer acceptability of the different products developed. Studies on the quantity, season and centres of supply of different economically unimportant raw materials with a view to offering advice on commercial production of products based on these raw materials.



**Sharkfin rays are
a promising product**

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