

### Marine Biotechnology Laboratory

The Station has a well-developed state-of-art biotechnology laboratory to carry out cutting edge research in the field of genetics, genomics, cell culture and biotechnology. The laboratory is well equipped with equipment like Inverted Microscope, Thermal Cycler, Refrigerated Centrifuge, Osmometer, Digital Balance, Laminar Flow Hood, Orbital Shaker, Incubator, Refrigerator, Deep Freezer, Magnetic Stirrer, Hot air oven, Autoclave, Cryo Can and Gel Electrophoresis system.



### Hydrography Laboratory

A laboratory for analyzing physico chemical parameters such as DO, pH, salinity, alkalinity, BOD, TSS, TDS, dissolved nutrients (NH<sub>4</sub>, NO<sub>3</sub>, NO<sub>2</sub>, Po<sub>4</sub>), chlorophyll pigments, phytoplankton and zooplankton from seawater and required sediment quality parameters is an added facility to this Station. The lab possesses essential equipment such as BOD incubator, salinometer, zero adjustment automatic burette, microscopes, UV-Vis spectrophotometer, hot air oven, centrifuge, water bath, pH meter, double distillation unit, water, plankton and sediment samplers etc.

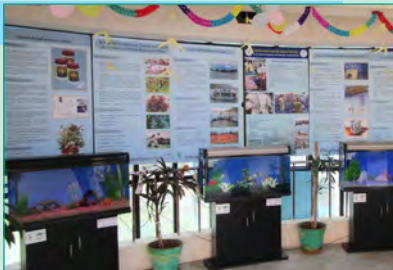
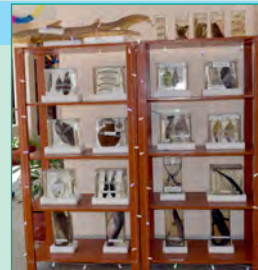


### Data Processing Unit for Fish Catch Estimates

In order to develop a scientific sampling plan for estimating marine fish landings, fishing effort and primary market value for marine fishery resources for the notified centres in Tamil Nadu, a core team has been developed for institutionalization of the estimation procedure and also established a database serving mechanism with networked input/output and marine fish landings estimates reporting facilities. A high end data processing unit has also been set up.

### Marine Biodiversity Museum

The Marine Biodiversity Museum has collection of the bio-resources of the coast of Tamil Nadu and Pondicherry. The Museum houses specimens of finfishes, crustaceans, molluscs, echinoderms, sea pens, marine turtle and sea snakes. The museum is open to scientists, researchers, teachers, students and general public.



### Other Infrastructural Facilities

#### Library cum Conference Hall

The Regional Station has a large collection of important reference books, back volumes of marine fisheries journals of national and international importance, current issues of periodicals on fish and fisheries, aquaculture, oceanography and molecular biology. The library also has digital copies of several publications. The conference hall with a seating capacity of around 50, facilitates organization of important official meetings, stakeholder consultations, seminars, workshops, and training programmes.



### Training Programmes and Outreach Activities

The Station conducts regular stakeholder workshops to disseminate the research findings to the fishing communities of the region, as well as to obtain feedback and first-hand information on the challenges and constraints being encountered. As a part of technology transfer, the Station organizes outreach programmes like demonstrations and training programmes on stock assessment and other mariculture technologies for the benefit of all stakeholders including fishers, officials of the state government development departments, scholars, students etc.

### TSP and SCSP Programmes

The major thrust was on capacity building and socio economic empowerment of Scheduled Tribe and Scheduled Caste beneficiaries. Different trainings and awareness programmes are being organised under Tribal Sub Plan and Scheduled Caste Sub Plan components, to bring awareness and inculcate technical knowhow on cage culture of marine finfishes among ST and SC beneficiaries, who are mostly landless and without any permanent source of income. Regular field visits for onsite advisories, handholding support and distribution of critical inputs were also facilitated for enhanced adoption.

### Linkages

The Station has well-knit linkages with organizations like ICAR-CIBA, ICAR-CIFT, IIT Madras, NIOT, NCSCM, BOBP, MPEDA, CIFNET, NIPPHATT, FSI, GSI, NIO, Gandhigram Rural Institute, Madras Port Trust, and other Central Government organizations. It also has very good linkage with the Department of Fisheries, Govt. of Tamil Nadu, TNJFU, TANUVAS, Anna University, Madras University and other prestigious state research Institutes. The Station also has good liaison with reputed private universities like SRM Institute of Science and Technology, Vellore Institute of Technology, Sri Venkateshwara College of Engineering and Sathyabama Institute of Science and Technology.

### Consultancy Services

The Station offers consultancy in the areas of marine fisheries management (estimates and stock assessment); breeding and seed production of marine finfishes, mariculture in cages and ponds; live feed culture technology; biodiversity and environmental impact assessment; design, fabrication and deployment of artificial reefs for marine fisheries management, and socio economic research.

### Service Providing Activities / Participation in Exhibitions

Scientists of this Centre are also involved in delivering guest lectures, awareness talks and disseminating required information for the stakeholders as a part of scientific social responsibility and contribute for the betterment of society as well as nation. The Research Station actively participates in the National Days, International and National events being conducted by different government departments and showcase the outputs, technology transfers and products brought out by the Institute in the form of setting up exhibition stalls.



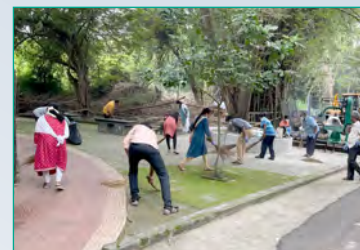
### Internship and Dissertation for Students/ Researchers

The Station facilitates short-term internship and dissertation for undergraduate and post graduate students to undertake training cum research in cutting edge areas of research using its facilities. The scientists of the Station also serve as Major Advisors and Co-advisors for the research scholars from recognized institutions. Scientific visits of students are also facilitated.

### Swachh Bharat Mission



Cleanliness drives and awareness campaigns are organized regularly by the Centre with the mission on *Swachh Bharat Swasth Bharat*. The Station also promotes a green environment through plantation and distribution of saplings to different stakeholders through *Poshan Vatika Maha Abhiyan*.



### Thrust Areas - Plan for the Future...

- Comprehensive mapping of the marine fishery resources on time series and spatial distributional scale, abundance, sustainable yield and management policy briefs, status reports.
- Benchmark data on the coastal productivity, recruitment, shift and emergence, diversity, habitat, valuation of ecosystem services, niche expanses, anthropogenic and developmental pressure, pollution.
- Coastal productivity enhancement programmes – artificial reefs and their impact study, reproductive refugia, nursery refugia, cage culture, bivalve farming.
- Domestication and breeding in declining high value lobsters, crabs, flat fishes –technology for commercial operations, diversified options in aquaculture –nutrition and health package.
- Monitoring cell on coastal productivity, fishery, degradation, interventions.
- Impact of climate change on marine fisheries for the south-east coast.
- Monitoring and developing strategies for conservation of marine mammals and turtles.
- Omics and biotechnological interventions for enhanced production in prioritized mariculture species.
- In-vitro cell culture technology and cellular aquaculture for development of prototypes.
- Economic evaluation of fishery operations, marketing and trade and assessment of capital formation in marine fisheries sector of Tamil Nadu and Puducherry.
- Socio-economic studies, governance, community empowerment and gender mainstreaming.



## A GLIMPSE OF Madras Regional Station ICAR-CMFRI

**MADRAS REGIONAL STATION**  
**ICAR- CENTRAL MARINE FISHERIES RESEARCH INSTITUTE**

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## About ICAR-CMFRI

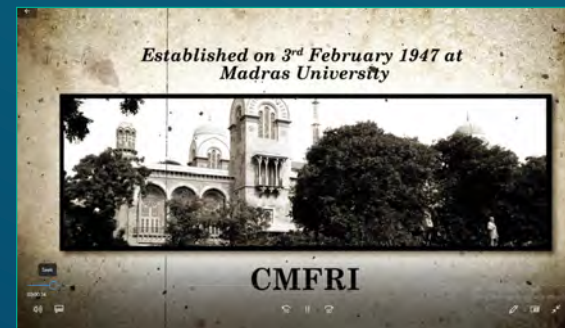
The ICAR-Central Marine Fisheries Research Institute (ICAR-CMFRI) with headquarters at Kochi is a premier multidisciplinary fisheries research Institute under the Indian Council of Agricultural Research (ICAR), New Delhi. During the course of over 75 years, the Institute has emerged as a leading tropical marine fisheries research Institute in the world. The CMFRI, which celebrated its 75<sup>th</sup> Anniversary in the year 2022, grew significantly in size and stature by establishing 4 Regional Centres, 7 Regional Stations, 17 Field Centres and 2 Krishi Vigyan Kendras, building up adequate infrastructure and technically competent scientific manpower.

## Our Mandate

- Monitor and assess the marine fisheries resources of the Indian Exclusive Economic Zone (EEZ) including the impact of climate and anthropogenic activity and develop sustainable marine fishery management plans.
- Basic and strategic research in mariculture to enhance production.
- Act as a repository of geospatial information on marine fishery resources and habitats.
- Consultancy services and human resource development through training, education and extension.

## History of Madras Regional Station

The history of the Madras Regional Station of CMFRI dates back to the year 1947 when the headquarters of CMFRI was first established in the premises of the Zoological Research Laboratories of the University of Madras. In 1949, the CMFRI headquarters was shifted to Mandapam Camp, leaving behind a Fishery Survey Unit at Madras, which was upgraded as a Research Unit in 1952, and further upgraded to Sub-station in 1965.

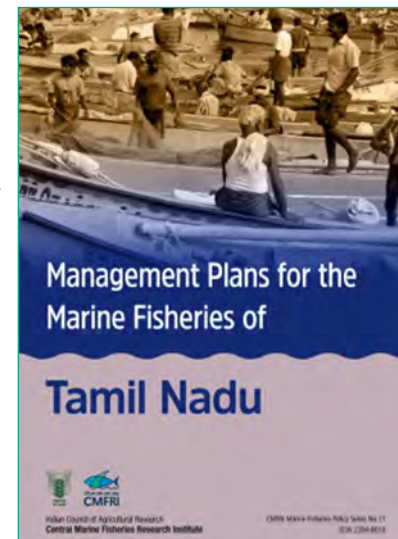


With the expansion of research activities, the research unit expanded to be a Research Centre, then as a Regional Station, and came to be known as Madras Regional Station of CMFRI. In addition to a field laboratory at Kovalam, this Centre administers two field centres viz., Ongole and Cuddalore along the Coromandel coast. It is an active Centre for research in marine capture and culture fisheries. Most of the mariculture work is carried out at the Kovalam Field Laboratory.

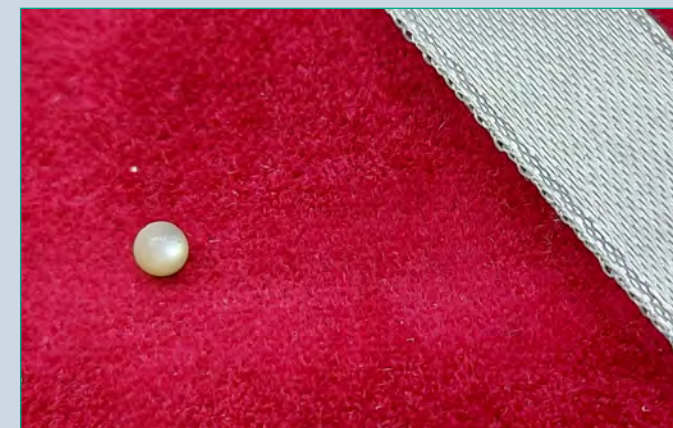
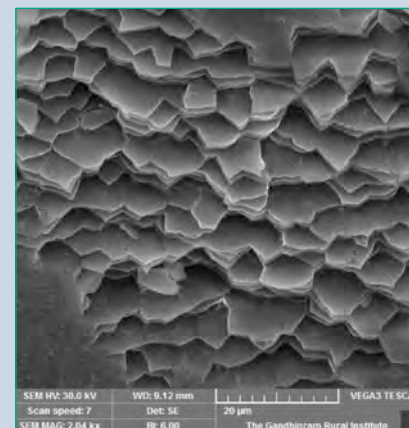


## Major Achievements

- Assessment of the pelagic, demersal, crustacean and molluscan fishery resources along north Tamil Nadu-South Andhra Pradesh coast and estimation of potential yield of several stocks.
- Monitoring and strengthening of data base on fishery and biology of major pelagic, demersal, crustacean and molluscan resources occurring in trawl net /gill net / hook & line landings along Tamil Nadu and Puducherry coast.
- Quantitative and qualitative analysis of the low-value by-catch (LVB) of trawl operations from Chennai was done, with special emphasis on the extent of removal of juveniles of commercially important finfishes and shellfishes.
- Hatchery production of the seed of penaeid prawns, *Penaeus japonicus*, *P. monodon*, *P. indicus*, *P. semisulcatus*, *P. latisulcatus* and *P. canaliculatus* for the first time in India; Development of a sustainable extensive prawn culture method using improved feeding strategies.
- The hydrographic variables were monitored on regular basis. Seasonal variations in phytoplankton and zooplankton were studied.
- Hatchery raised seed of *Thenus unimaculatus* raised in 340 days and wild collected seed of *T. unimaculatus* and *Petrarctus rugosus* matured in captivity, mated and spawned.
- Parallel experiments on sea bass juvenile nursery rearing and grow out in cement tanks and in open sea cages carried out. Site surveys were carried out in Thiruvallur district and Kancheepuram district for carrying out capture-based cage farming demonstration programmes.
- Designed, fabricated and deployed artificial reefs for stock enhancement along the south east coast.



- Pellet feed diets were developed for broodstock of spiny lobsters *P. ornatus*, *P. versicolor* and *P. polyphagus*.
- Development of hatchery techniques for the green mussel *Perna viridis*, the clam *Meretrix casta* and the pearl oyster *Pinctada fucata*; Culture of mussels in the open sea in a saline lagoon and in an estuary; Adaptive research on oyster culture.
- Development of a lustrous invitro marine black pearl prototype through mantle epithelial cell culture technology in the blacklip pearl oyster *Pinctada margaritifera*.
- Transcriptomics profiling of Asian green mussel *Perna viridis* and metamorphosing flat fish, Indian Halibut, *Psettodes erumei*.
- Price details for major fishes in landing centre, wholesale and retail markets of Chennai have been collected and analyzed.
- Studies on fishery subsidies in India and the world were compiled.



## Resource Monitoring and Assessment

The Regional Station is involved in regular monitoring of marine landings, assessment of commercially important marine resources and development of management plans for the marine fisheries. Most of the landing centres are regularly surveyed for data collection on marine landings using the 'Stratified Multi Stage Random Sampling' design. Major resources are further studied in detail for estimating Biological Reference Points (BRPs) from selected major fishing harbours and stocks are assessed using length based fish stock assessment models. Based on the status of stock, management advisories are issued for sustainable utilization of the resources.



## Mariculture Technology Development

With focus on mariculture for increasing national fish production, and with the need for species diversification in aquaculture, package of practices on breeding and seed production and culture of economically valued marine finfish species are carried out at the Centre including research and technology development on ornamental fishes. Realizing the importance of skill development and technology dissemination for achieving the true potential of mariculture, multiple training programmes and demonstrations were performed on different culture methodologies. These include marine and coastal cage farming of Indian pompano, Asian seabass and orange spotted grouper.



## Research Facilities

### Marine Biology Laboratory



The Station is equipped with a laboratory for fish dissection and basic analysis of biological aspects of fish, primarily reproduction and diet dynamics. The lab has several equipment including microscopes, digital cameras, lighting systems and freezers. The lab is currently used for biological studies of finfish and shellfish as well as taxonomic studies of the same.



### Mariculture Laboratory

The Station houses the modern mariculture facilities in the country. A lobster hatchery facility (with broodstock maturation unit, spawning unit, quarantine unit and LRT unit) was established in the New Mariculture Complex at Kovalam, Chennai. Nearly 400 adult sand lobsters can be held in the maturation facility. The Centre has established a unique sea water intake system which has an excellent slow sea water sand filter system. Water storage of the facility of 50 tonnes has been created to ensure continuous supply of treated seawater. A broodstock facility containing two numbers of 100 tonnes tanks have been created for holding and developing broodstocks of commercially important fishes. A larviculture facility is available for carrying out larval rearing of commercially important fishes and crustaceans. Commercially important clown fishes and damselfishes are being maintained for production of fingerlings. The algal lab has different stock cultures which are maintained under controlled temperature and light conditions.

