



ICAR-CIFA

*Grow fish...
Grow with fish...*



ICAR-Central Institute of Freshwater Aquaculture

(An ISO 9001:2008 Certified Institute)

Kausalyaganga, Bhubaneswar-751002, Odisha, India



About Us

The ICAR-Central Institute of Freshwater Aquaculture (ICAR-CIFA) is a premier Institute in freshwater aquaculture in India under the administrative control of Indian Council of Agricultural Research (ICAR), New Delhi. The present Institute has had its beginnings in the Pond Culture Division of the Central Inland Fisheries Research Institute (CIFRI), Barrackpore, West Bengal and was established at Cuttack, Odisha in 1949. During that period, ground breaking research attempts with three technologies viz., induced breeding of carps through hypophysation, practices of nursery and rearing pond management; and composite carp culture were successfully standardized and transferred to the field. This has virtually brought the freshwater aquaculture sector of the country from the level of backyard activity to a fast growing and well organized industry. Later, the CIFRI in a major effort to give emphasis on freshwater aquaculture research, initiated steps on establishing the Freshwater Aquaculture Research and Training Centre (FARTC) over a 147 ha campus at Kausalyaganga, Bhubaneswar, Odisha. The Centre blossomed into an independent institute during 1987 as the Central Institute of Freshwater Aquaculture. The Institute is also the Regional Lead Centre on 'Carp Farming in India' under Network of Aquaculture Centres in Asia-Pacific (NACA), Bangkok. ICAR-CIFA is undertaking research on basic and applied aspects of carps, air-breathing fishes, freshwater prawns and mollusks. The Institute possesses fully equipped laboratories in the disciplines of finfish and shellfish breeding including ornamental fishes, fish physiology, nutrition, genetics, biotechnology, nanotechnology, proteomics, microbiology, pathology, engineering, economics, statistics and extension.

Vision

Making Indian freshwater aquaculture globally competitive through eco-friendly and economically viable fish and shellfish production systems for livelihood and nutritional security.

Mission

Excellence in research for developing sustainable and diversified freshwater aquaculture practices for enhanced productivity, quality, water use efficiency and farm income.

Mandate

- To conduct basic, strategic and applied research in freshwater aquaculture;
- To enhance production efficiencies through incorporation of biotechnological tools;
- To undertake studies on diversification of aquaculture practices with reference to species and systems; and
- To provide training and consultancy services



Prime Minister Smt. Indira Gandhi while laying the foundation stone



Aerial view of ICAR-CIFA

Divisions/Centres/Units

The Headquarters of ICAR-CIFA is located at Kausalyaganga along the Bhubaneswar-Puri highway 203, at about 12 km from Bhubaneswar city, the capital of Odisha. The headquarters of ICAR-CIFA works with the four scientific divisions and one section to work on the set mandates. The headquarters also possess the administrative and financial units towards management of the institute.

Aquaculture Production and Environment Division

The division works on technology development on breeding, seed production and grow-out culture of important cultivable freshwater finfishes and shellfishes like major and minor carps, barb, murrels, anabas, catfishes like magur, pangas, pabda, freshwater prawn, indigenous ornamental fish and freshwater mussel to cater the need of food security of the country. The major focus of the division is diversification of the species and culture system to add more and more species into the freshwater aquaculture sector and to develop viable, alternate rearing system in view of new challenges of water scarcity and climate change. The division also works on water budget modeling of freshwater fish production system, farm mechanization, design and development of farm implements. The division is conducting regular training programme and giving consultancy services to national and international organisation in order to boost fish production scenario.

Fish Nutrition and Physiology Division

The division works on developing standard feeds for carps, catfish and prawns with Bureau of Indian Standards. The division possesses a National Feed Testing and Referral Laboratory for feed quality assurance and certification and a state-of-the-art Feed Mill for feed technology demonstration. It has a climatology laboratory for climate change study in fish physiology, fish digestibility laboratory for nutrient digestibility studies. The division also works on off season gonadal maturation and seed production techniques in carps. Significantly the division has developed a catalogue of region based feed resources in India.

Fish Genetics and Biotechnology Division

The division works to achieve the goal of genetic enhancement of fish and shellfish species through application of cutting edge technology. This involves genetically improved varieties of fish and shellfish, new breed development, quantitative genetics, transgenic, proteomics, genomics, functional genomics, bio-informatics etc. These processes help in developing an integrated cost effective Marker Assisted Selection program for carp and freshwater prawn species. It is actively engaged in development of genomics resources such as DNA markers, marker maps, experimental populations, EST databases, BAC libraries and above all the whole genome sequence of prioritized fish and shellfish species.

Fish Health Management Division

The division is mandated to conduct basic, strategic and applied research on freshwater fish and shellfish diseases and to enhance aquaculture productivity through application of environment friendly microorganisms. The division also provides trainings and consultancy services to different stakeholders in the field of disease management. The other activities of the division include national level monitoring of fish disease outbreaks and serological screening of diseases, developing vaccines using molecular techniques, molecular characterization of important bacteria, viruses, parasites and fungi. The division also works on the application of probiotics in aquaculture, immunity and immunomodulation in fish, maternal immunity in carps and their role in seed survival, cell culture techniques in fish, repository of pathogenic bacteria and immuno- diagnostic reagents, isolation and characterization of bacteria associated with nutrient cycles and bioremediation, biodiversity and identification of microorganisms important to aquaculture and nanotechnology in aquaculture.

Social Science Section

The Social Science Section works towards popularizing research results for the overall development of the freshwater aquaculture sector, to provide a forum for feed back to the Institute, to maintain liaison with the fish farmers, fisheries departments and fishery industry as a whole. The section also organizes short term refresher courses, to conduct research investigations for studying the extent of adoption of the new and improved technologies developed by the Institute and to conduct economical and statistical investigations on various aspects of freshwater aquaculture.

Regional Research Centres

The Institute possesses four Regional Research Centres at Rahara in West Bengal, Bengaluru in Karnataka, Vijayawada in Andhra Pradesh and Anand in Gujarat and one field station at Kalyani in West Bengal. These centres/station carry out researches for regional needs under different geographical situation and also to act as outlets for technology dissemination.

Krishi Vigyan Kendra-Khordha

The institute also hosts a farm science centre, the Krishi Vigyan Kendra mandated for Khordha district, Odisha by ICAR. The KVK works on technology assessment, refinement and training on agricultural and allied sectors. It is the extension arm of ICAR-CIFA in transferring technologies for both backward and forward linkages. The KVK is situated inside the campus of ICAR-CIFA under its administrative control.

Agricultural Technology Information Centre

ICAR-CIFA has an Agricultural Technology Information Centre (ATIC) established for better interaction between researcher and technology users. This serves as a single window system with an objective to help the farmers and other stakeholders both to provide solution to their location specific problems and make available all the technological information along with technology inputs and products for testing and use by them. All farmers visiting the institute are directed to ATIC for proper and timely advisory services.

Business Planning and Development Unit

The BPD unit of ICAR-CIFA focuses on creating technology-oriented successful business ventures in freshwater aquaculture. BPD-CIFA concentrates on available technologies transfer both from ICAR-CIFA and other ICAR Institutes to the eligible entrepreneurs in the mandated areas. To utilize the technology and to establish a profitable business unit, BPD-CIFA will assist in creating entrepreneurship models and handhold the new entrepreneurs to take up their idea for successful business ventures in aquaculture.



Agricultural Technology Information Centre



Business Planning and Development Unit

Our Infrastructure & Facilities

ICAR-CIFA is situated in a sprawling campus of 147 ha with a main building accommodating 50 well-equipped laboratories to conduct basic and applied research on freshwater aquaculture. The institute has a fish farm with about 50 ha water spread area comprised of 380 ponds for experimental purposes. Three carp hatcheries with production capacity of over 50 million spawn along with hatcheries for catfishes, anabas, murrel and freshwater prawns are in possession of the institute. ICAR-CIFA has also a hatchery for producing mono sex tilapia. It has 600 m² wet laboratory with modular FRP and concrete tanks. The institute also has a modernized feed mill, facilities for running water fish culture, sewage-fed fish culture, integrated fish farming as well as a public aquarium, technology park etc. Dr. Hiralal Chaudhuri library of ICAR-CIFA houses over 7014 books/monographs, 2900 back volume journals and also at present subscribes 101 journals including 37 peer reviewed international journals, besides large number of bulletins, training manuals, reports and other periodicals. The library is fully automated with Koha library management software. The library is proud to be a part of the partner of the NAIP's e-Granth project. It has also been recognized as the FAO depository library and has a good collection of FAO publications related to fisheries and agricultural sciences. Further, a knowledge management cell, women cell, PME cell, ITMU, Vigilance cell, Hindi cell Central instrumentation laboratory and workshop are available. Other infrastructure facilities include 122 staff quarters of different categories, Dispensary, Guest Houses, Trainees' Hostel, Canteen, Conference Hall, Auditorium, Staff Recreation Club, Children park, Post-office and Bank.



Carp Hatchery



Feed Mill



Laboratory



Public Aquarium



ICAR-CIFA Farm

Research Achievements

- Packages of practices for breeding and grow-out culture technologies for carps, barbs, catfishes, murrel, anabas and freshwater prawn. Development of breeding protocol of small indigenous fish species like Pabda, *M. gulio*, *C. reba*, *Pengba*, *Rita chrysea* etc.
- Production of improved rohu 'Jayanti', with average realized response of 17% per generation after eight generations through selective breeding.
- Production of improved giant freshwater prawn *Macrobrachium rosenbergii*, with average realized response of 4% per generation.
- Production of first generation of aeromoniasis-resistant rohu (*Labeo rohita*) with selection response of 31.1%.
- Initial success of breeding of Hilsa (*Tenulosa ilisha*) by dry stripping method.
- Development of integrated farming system model with high value agri-horti crops with small indigenous fish.
- Breeding and culture of ornamental fishes including indigenous species and a new variety "Shining barb".
- Production of round and designed cultured pearls through implantation of biocompatible nuclei in freshwater mussels, *Lamellidens marginalis*.
- Development of protocol for surrogate carp seed production.
- Protocol for bulk cryopreservation of fish milt.
- Development of PCR-based catla (*Catla catla*)-rohu (*L. rohita*) reciprocal and backcross hybrid identification kit.
- Development of microsatellite-based DNA markers for *L. rohita* and *M. rosenbergii*.
- Generation of first high density SNP based linkage map of *L. rohita*.
- Generation of transcriptome data of *L. rohita* and of one ectoparasite *Argulus siamensis*
- Development of carp broodstock diet CIFABROOD™ and Starter-M as weaning diet for magur larvae.
- Commercialization of technology/products like CIFAX for controlling the Epizootic Ulcerative Syndrome (EUS), Immunoboost-C and CIFACURE.
- Characterization of several innate immune genes such as TLRs, Mx protein, cytokines, acute phase proteins and antimicrobial peptides etc.
- Synthesis and characterization of different metal nanoparticles viz. magnesium, gold, selenium and iron for fish health management and water remediation.
- Development of PCR based diagnostics of *Aeromonas hydrophila*, *Argulus spp*, *M. rosenbergii* nodavirus, Koi herpes virus and spring viraemia of carp
- National surveillance programme on aquatic animal diseases for screening of fish and shellfish diseases for the states Odisha & Andhra Pradesh.
- Aquacultural implements viz., portable FRP carp hatchery, portable magur hatchery are already in the market and demand feeders, automatic feeder and a range of disease diagnostic kits are ready for commercialization.
- Bio-fertilizer called "Fish biofert" and a liquid fertilizer called "Fish hydrolysate" developed from fish waste.
- Socio-economic development and gender mainstreaming through aquaculture intervention.

Future Thrust Areas of Research

- Aquaculture (system and species) diversification
- Climate resilient aquaculture
- Breed improvement for growth and disease resistance of fish and shellfish with MAS
- Fish genomics, proteomics and nanotechnology
- Year round breeding and seed production of fishes
- New FRP gadgets for Aquaculture
- Water budgeting, ecosystem services and bioremediation
- Aquaculture farm mechanization, automation and use of renewable energy resources
- Organic farming
- Fish larval and grow out nutrition
- Fish as health food
- Molecular- and immuno-diagnostics and immunoprophylaxis
- Molecular endocrinology and impact of environmental manipulation on freshwater fish physiology
- Socio-economic impact and policy research
- Empowerment of women through aquaculture intervention
- Entrepreneurship development in aquaculture
- ICT and Space Technology in aquaculture

Farmer FIRST

ICAR-CIFA is actively engaged in transfer of developed technologies on different aspects of freshwater aquaculture through tailor made and regular training programmes/ Kisan Melas, workshops, fisheries forums, aqua field schools and regular interaction with the line departments and sister institutes. Every year around 3000 farmers are getting exposed and trained in Freshwater aquaculture technologies through its various programmes including Tribal Sub Plan and North East Hill Development programme. Recently 'Mera Gaon Mera Gaurav' programme undertaken by the ICAR-CIFA is a genuine attempt to ensure flow of technology and advisories to the farmers.



"Know Your Farmer" Programme



Exposure Visit of West Bengal Farmers to ICAR-CIFA



African Trainees in Murrel culture unit



Aquaculture in Bali Island, Sunderbans



Tribal Women involved in Aquaculture

ICAR-CIFA



For any further details, Please contact/write to

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