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वार्षिक प्रतिवेदन

ANNUAL REPORT

2024

ICAR-CIFE

Mumbai

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Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

वार्षिक प्रतिवेदन
ANNUAL REPORT
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ICAR-Central Institute of Fisheries Education
Mumbai-India

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The "Fish+Academics" concept symbolizes the fluidity of knowledge and the depth of academic exploration. This AI-generated design reflects a seamless blend of nature and intellect.

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Foreword

The fisheries sector plays a crucial role in supporting several United Nation's Sustainable Development Goals (SDGs), especially those related to food security, economic growth, and environmental sustainability, such as . SDG 1 (no poverty), SDG 2 (zero hunger), SDG 8 (decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 14 (Life Below Water), and SDG 17 (Partnerships for the Goals). India's fish production in both marine and inland sectors is growing parallelly with the rising demand for food fish. Leveraging its abundant resources, scientific advancements, and entrepreneurial efforts, the country achieved a record fish production of 18.4 million metric tons in 2024, with around 8% share in global fish production. Globally, India leads in shrimp production, and ranks second and third in aquaculture and capture fisheries production, respectively. Aquaculture plays a vital role in ensuring food security and driving economic growth, contributing nearly 75% to the nation's total fish output. The aquaculture sector continues to expand at an impressive rate of 8-9%, outpacing other agriculture-related industries in India. The fisheries sector contributes significantly to the economy, with exports valued at ₹60,523 crore (US $7.38 billion), accounting for 1% of the total GDP and 5% of the agricultural GDP. It also supports the livelihoods of over 25 million people across the country. A major government initiative, the Pradhan Mantri Matsya Sampada Yojana (PMMSY), under the Atmanirbhar Bharat program, aims to further strengthen and develop the fisheries sector, paving the way for sustained growth.

The growth and sustainability of the fisheries sector depend heavily on in-depth research, education, and extension activities across all areas—capture fisheries, aquaculture, and post-harvest management. Education plays a crucial role in driving the rapid expansion of the fishing industry. As a leading institution, ICAR-CIFE has consistently been at the forefront of fisheries education and research. The institute carries out cutting-edge research across various disciplines within fisheries and has significantly contributed to advancing scientific knowledge, promoting aquaculture development through education, disseminating technology, and fostering entrepreneurship. ICAR-CIFE is NABL accredited and has secured 9th NIRF rank in agriculture & allied sciences. CIFE was also ranked 7th among 73 Indian Agricultural Universities and has been accredited A+ by the Education Division. CIFE has won green campus

award and is ISO 9001 certified. CIFE has forged collaborations with numerous national and international organizations for research, education and technology development

In the academic year 2024, a total of 96 students were admitted to various Master's degree programs (M.F.Sc), while 61 students were enrolled in Doctoral degree (PhD). 92 M.F.Sc and 46 PhD students received their degrees in the 17th Convocation of ICAR-CIFE.

ICAR-CIFE has made significant contributions to the advancement of fisheries research in India. At present, the institute is actively involved in 32 institutional and 31 externally funded projects, all targeting key priority areas in fisheries science. These projects cover a wide range of subjects, including biofloc technology, improving growth and reproductive performance in aquaculture species, development of inbred zebrafish laboratory strains, diagnostics for fish and zoonotic pathogens, value addition in fishery products, applications of nanotechnology, and exploration of alternative feed ingredients.

The institute's research output is substantial, with 193 publications in national and international journals, along with 50 popular articles, 5 books, 38 book chapters, 21 training manuals and 42 extension publications. In 2024, ICAR-CIFE researchers also achieved notable recognition with the granting of two patents and two copyrights.

The Inland Saline Aquaculture (ISA) project stands as the flagship initiative of ICAR-CIFE, and the institute has played a pioneering role in promoting inland saline aquaculture in India, helping to transform unproductive saline-alkaline lands into economically viable aquaculture zones. ICAR-CIFE has successfully identified and adapted several species suitable for inland saline conditions, such as *Pangasianodon hypophthalmus* (Pangasius), *Lates calcarifer* (Asian seabass), *Litopenaeus vannamei* (Pacific white shrimp), and *Scylla serrata* (mud crab). In addition, regular training programs, workshops, and extension services have been conducted for farmers, researchers, and state officials to promote inland saline aquaculture practices in states like Haryana, Punjab, Rajasthan, and Gujarat have showcased the economic viability of saline aquaculture, encouraging its adoption. The institute also studies the long-term sustainability and ecological impact of inland saline aquaculture, contributing to responsible resource management.

The farmer education program has always been a priority of ICAR-CIFE. Short Term Training Programs (STP) and Skill Development Programs (SDP) are implemented annually at ICAR-CIFE headquarters and centers to introduce fisheries stakeholders to industry advancements and new ways of creating livelihoods and entrepreneurship development. In 2024, 86 SDPs were organized that benefited 1970 (Male-1531, Female-439) stakeholders largely farmers from different regions of the Country. The Agri Business Incubation (ABI) Centre trained 628 trainees potential aquapreneurs and 42 incubatees registered in the year 2024. Under TSP and SCSP, 46 & 63 training programs were organized that benefitted 1715 (Male-1212, Female-503) and 2272 (Male-1477, Female-795) farmers, respectively to improve their income and livelihood through fisheries and aquaculture technology interventions. About 1082 (Male-498, Female-584) beneficiaries received skill development trainings and technology inputs under 38 NEH programs. About 15 TV/Radio talks were delivered during the year 2024. About 7490 stakeholders visited ICAR-CIFE Exhibition stalls in 12 national & international expos in which CIFE has participated. A total of 3146 visitors (Male-1772, Female-1374) visited ICAR-CIFE, Mumbai & its five regional centres during the year 2024.

The significant transformation of the training institution into a national university with the highest standards of education in fisheries has been possible due to the diligent and tireless efforts of past and present staff, institute directors, and the continued support of the ICAR headquarters. I thank everyone who built this institute, making it a popular student destination and fisheries research center in India.

I sincerely thank Dr. Himanshu Pathak, Secretary, DARE, and DG, ICAR, and Dr. J. K. Jena, DDG (Fisheries Science) for their unstinted support and constant guidance to all our activities. We are thankful to Dr. Shubhadeep Ghosh, ADG (Marine Fisheries), Dr. Devika Pillai, ADG (Inland Fisheries), and other colleagues of the Fisheries Department for their cooperation and support. Sincere thanks to the board members, the president and member of the research council, members of the academic council, the research council of the institute, the extension board, the examination committee, and other institute-level committees for their cooperation and support. Special thanks to the ICAR-CIFE family for their contributions and congratulations to the Annual Report-2024 publishing team for bringing out this wonderful compilation of ICAR-CIFE's achievements.

(Dr. Ravishankar C.N.)
Director & Vice-Chancellor, ICAR-CIFE

Executive Summary
कार्यकारी सारांश

Fisheries education and research have been instrumental in the sector's development over the last six decades and will continue to be an integral part of the national plan to realize the second blue revolution in India. ICAR-CIFE has contributed remarkably to developing the fisheries sector since its inception in 1961, catering to the needs of industry and academia alike. The institute has evolved from a training center to a deemed-to-be-university. Today, the institute, with its highly qualified scientific and technical human resources, offers postgraduate programs in 11 specialized disciplines of fisheries science. About 150 postgraduate students joined the institute annually through national entrance examinations. CIFE has the best research infrastructure and laboratory facilities at the headquarters and its five centers, providing enormous opportunities for scientists and students to develop their research ideas into workable solutions to the problems of the fisheries sector. The institute continues providing trained human resources, who contribute to the development of the fisheries sector in various capacities as entrepreneurs, scientists, educationists, consultants, and trainers.

The research activities of CIFE are oriented to serve the dual goal of scientific advancement and the sector's welfare. In 2024, the institute operated 32 institutional projects and 31 externally funded projects. These research projects focus on the key areas of fisheries such as the improvement of growth performances of cultivated fish species, utilization of seaweeds and fish bio-wastes, antibody-based disease diagnosis, development of fish vaccine, development of alternate ingredients for aquafeed, nutritional intervention to improve reproductive performance of carp, aquaponics, diversification of cultured species, development of zebra fish lines for experimental purposes, breeding and larval rearing of ornamental fish, disease and antimicrobial resistance monitoring, risk assessment of chemical pollution of coastal water, bio-prospecting of microalgae, trophic chain-linked management of non-conventional fisheries resources, evaluation of the impact of SDPs, and predictive modeling for inland fisheries management. In 2024. CIFE published 193 papers in peer reviewed scientific journals. Further, 3 books, 30 book chapters, 40 popular articles, 20 training manuals, and 39 extension materials.

Highlights

- 32 institutional projects and 31 externally - funded projects were in operation in 2024.
- 193 research papers were published in national and international journals.
- 50 popular articles, 21 training manuals, and 42 extension materials were published
- In total, 236 Skill Development Programs (SDPs) were conducted with 7105 (Male-4762, Female-2343) participants
- 92 Masters and 46 Ph.D. students successfully completed their postgraduate programs
- 27 students received awards in various scientific conferences.
- 11 MoUs were signed with Indian and overseas universities
- 2 patents and 2 copyrights were granted for innovations by CIFE scientists
- 9 technologies were commercialized

CIFE has initiated numerous activities to promote research and entrepreneurship among students, such as the students' convention in which students from all fisheries colleges of India showcase their research, Academia-Industry conclave on entrepreneurial opportunities, workshops on youth entrepreneurships, IPR management, competitions on innovative ideas, among others. Recently, CIFE conducted International Students' Conference on Globalization of Fisheries Education in which 650 students from 22 countries participated. *FishSwad*, in which students of CIFE present an impressive array of fish-based cuisines from across India, has become an annual event that everyone looks forward to. This has also helped CIFE to reach general public in Mumbai and promote fish consumption.

Furthermore, CIFE is actively engaged in academic and sectoral collaboration through various meetings, including those with Deans of fisheries colleges, Directors of State Fisheries

Departments, and ICAR research institutes. Last year, CIFE introduced a unique recruitment drive for students from all fisheries colleges, attracting a diverse range of industries spanning multiple domains within the fisheries sector.

CIFE fosters a theme-based work culture, ensuring a sharp focus on research and academic excellence. In previous years, we emphasized "Knowledge Commercialization," "Academic Excellence," and "Student Entrepreneurship."

During 2024, CIFE and its centers conducted 86 skill development programs (SDPs) in which 1970 (Male-1531, Female-439) trainees from different parts of the country participated. The training programs covered diverse topics such as fish quality management & certification, fish health and water quality management, algal biomass production, novel fish feed preparation methods, scientific communication skills for students and researchers, ornamental fish culture and breeding, antimicrobial resistance in aquaculture etc. Stakeholders from different sections of fisheries sector such as the farmers, entrepreneurs, quality control managers, consultants, faculty from the SAUs and students benefitted from the training programs. About 1082 (Male-498, Female-584) beneficiaries received skill development trainings and technology inputs under the 38 NEH programs.

Under the Schedule Caste Sub-Plan (SCSP), 63 training programs were conducted for 2272 (Male-1477, Female-795) farmers/students on freshwater aquaculture, leaf meal-based fish feed, shrimp farming techniques, and aquafeed preparation. Under the Tribal Sub Plan (TSP), 46 training programs were organized, which involved 1715 (Male-1212, Female-503) trainees from tribal regions of Maharashtra, Chhattisgarh, Manipur, Nagaland, and Tripura. In addition, seeds, feed, cast nets other aquaculture inputs were provided under this program to promote aquaculture and income generation among the tribal communities.

In 2024, the institute conducted statutory meetings such as the Research Advisory Committee (RAC), Institutional Research Committee (IRC), Academic Council, Extension Council, and Board of Management. The institute celebrated Vigilance Awareness Week, Yoga Day, Swachhta Abhiyaan, Hindi Pakhwada, Industry Day, Farmers' Day, and Republic and Independence Day.

The efforts of ICAR-CIFE in making society-relevant scientific advancement and creating fisheries professionals have been possible owing to its dedicated faculty, students, and administration. The unfailing support from the ICAR headquarters and cooperation from other fisheries institutions have only strengthened the institute's resolve to further fisheries development in the country that envisions a second blue revolution in the near future.

कार्यकारी सारांश

मत्स्य शिक्षा और अनुसंधान पिछले छह दशकों में इस क्षेत्र के विकास में महत्वपूर्ण भूमिका निभाते रहे हैं तथा ये दोनों भारत में दूसरी नीली क्रांति को साकार करने की राष्ट्रीय योजना का अभिन्न अंग बने रहेंगे। भा.कृ.अनु.प.-के.मा.शि.सं. ने 1961 में अपनी स्थापना के बाद से मत्स्य पालन क्षेत्र के विकास में उल्लेखनीय योगदान दिया है, जो उद्योग और शिक्षा दोनों क्षेत्रों की जरूरतों को पूरा करता है। संस्थान एक प्रशिक्षण केंद्र से एक समतुल्य विश्वविद्यालय के रूप में विकसित हुआ है। आज, संस्थान अपने उच्च योग्य वैज्ञानिक और तकनीकी मानव संसाधनों के साथ, मत्स्य विज्ञान के 11 विशेष विषयों में स्नातकोत्तर पाठ्यक्रम प्रदान करता है। राष्ट्रीय स्तर की प्रवेश परीक्षाओं के माध्यम से लगभग 150 स्नातकोत्तर छात्र प्रतिवर्ष संस्थान में प्रवेश लेते हैं। संस्थान के मुख्यालय और इसके पाँच केंद्रों में सर्वोत्तम अनुसंधान अवसंरचना और प्रयोगशाला सुविधाएँ हैं, जो वैज्ञानिकों और छात्रों को मत्स्य पालन क्षेत्र की समस्याओं के व्यावहारिक समाधानों में अपने शोध विचारों को विकसित करने के लिए अपार अवसर प्रदान करती हैं। प्रशिक्षित मानव संसाधन प्रदान करना संस्थान का सतत कार्य है, जो उद्यमियों, वैज्ञानिकों, शिक्षाविदों, सलाहकारों और प्रशिक्षकों के रूप में विभिन्न पदों में मत्स्य पालन क्षेत्र के विकास में लगातार योगदान देते रहते हैं।

भा.कृ.अनु.प.-के.मा.शि.सं. की शोध गतिविधियां वैज्ञानिक उन्नति और इस क्षेत्र के कल्याण संबंधी दोहरे लक्ष्य की पूर्ति के लिए उन्मुख हैं। वर्ष 2024 में, संस्थान ने 32 संस्थागत परियोजनाओं और 31 बाह्य वित्त पोषित परियोजनाओं का संचालन किया। ये शोध परियोजनाएं मत्स्य पालन के प्रमुख क्षेत्रों पर ध्यान केंद्रित करती हैं जैसे कि पालन की जाने वाली मछली प्रजातियों के वृद्धि-प्रदर्शन में सुधार, समुद्री शैवाल और मछली जैव-अपशिष्ट का उपयोग, प्रतिविष-आधारित रोग निदान, मछली के टीके का विकास, जलीय आहार के लिए वैकल्पिक सामग्री का विकास, कार्प के प्रजनन-प्रदर्शन को बेहतर बनाने के लिए पोषक तत्व प्रयोग, एक्वापोनिक्स, पालित प्रजातियों का विविधीकरण, प्रयोगात्मक उद्देश्यों के लिए ज़ेबरा मछली वंशों का विकास, सजावटी मछलियों का प्रजनन और लार्वा पालन, रोग और रोगाणुरोधी प्रतिरोध की निगरानी, तटीय जल के रासायनिक प्रदूषण का जोखिम मूल्यांकन, सूक्ष्म शैवाल की जैव-पूर्वेक्षण, गैर-पारंपरिक मत्स्य संसाधनों का पोषण-श्रृंखला से जुड़े प्रबंधन, एसडीपी के प्रभाव का मूल्यांकन और अंतर्स्थलीय मत्स्य प्रबंधन का पूर्वानुमान मॉडल आदि। वर्ष 2024 में के.मा.शि.सं. ने प्रतिष्ठित विद्वानों द्वारा समीक्षा की जाने वाली वैज्ञानिक पत्रिकाओं में 193 शोधपत्र प्रकाशित किए। इसके अलावा, 5 पुस्तकें, 38 पुस्तक अध्याय, 50 लोकप्रिय लेख, 21 प्रशिक्षण मैनुअल और 42 विस्तार साहित्य प्रकाशित की गईं।

झलकियाँ

- वर्ष 2024 में 32 संस्थागत परियोजनाएं और 31 बाह्य वित्तपोषित परियोजनाएं संचालित की गईं।
- राष्ट्रीय और अंतर्राष्ट्रीय पत्रिकाओं में 193 शोध पत्र प्रकाशित हुए।
- 50 लोकप्रिय लेख, 21 प्रशिक्षण मैनुअल और 42 विस्तार साहित्य प्रकाशित किए गए।
- संस्थान की राजभाषा गृह पत्रिका "जलचरी" के 02 अंक प्रकाशित किए गए।
- कुल मिलाकर, 7105 (पुरुष-4762, महिला- 2343) प्रतिभागियों के लिए 236 कौशल विकास कार्यक्रम (एसडीपी) आयोजित किए गए।
- 92 मास्टर्स और 46 पीएचडी छात्रों ने अपने स्नातकोत्तर कार्यक्रमों को सफलतापूर्वक पूरा किया।
- 27 छात्रों को विभिन्न वैज्ञानिक सम्मेलनों में पुरस्कार मिले।
- 11 समझौता ज्ञापनों पर हस्ताक्षर किए गए, एक-एक भारतीय और विदेशी विश्वविद्यालय के साथ।
- संस्थान के वैज्ञानिकों को नवाचारों के लिए 2 पेटेंट और 2 कॉपीराइट प्रदान किए गए।
- 9 प्रौद्योगिकियों का व्यावसायीकरण किया गया

के.मा.शि.सं. ने छात्रों के बीच शोध और उद्यमिता को बढ़ावा देने के लिए कई गतिविधियाँ शुरू की हैं, जैसे कि छात्रों का सम्मेलन, जिसमें भारत के सभी मत्स्य पालन कॉलेजों के छात्र अपने शोध का प्रदर्शन करते हैं, उद्यमिता के अवसरों के संबंध में अकादमिक-उद्योग सम्मेलन, युवा उद्यमिता पर कार्यशालाएँ, बौद्धिक संपदा अधिकार प्रबंधन, नवीन विचारों पर प्रतियोगिताएँ, आदि। हाल ही में, हमने मत्स्य पालन शिक्षा के वैश्वीकरण पर अंतर्राष्ट्रीय छात्र सम्मेलन आयोजित किया जिसमें 22 देशों के 650 छात्रों ने भाग लिया। फिश स्वाद, जिसमें संस्थान के छात्र भारत भर के मछली-आधारित व्यंजनों को अत्यंत आकर्षक ढंग से प्रदर्शित करते हैं, जो अब एक वार्षिक कार्यक्रम बन गया है, जिसका सभी को बेसब्री से इंतज़ार रहता है। इससे संस्थान को मुंबई की आम जनता तक पहुँचने और मछली की खपत को बढ़ावा देने में भी मदद मिली है।

इसके अलावा, हम विभिन्न बैठकों के माध्यम से शैक्षणिक और क्षेत्रीय सहयोग में सक्रिय रूप से शामिल हैं, जिनमें मत्स्य पालन महाविद्यालयों के अधिष्ठाता, राज्य मत्स्य पालन विभागों के निदेशक और भारतीय कृषि अनुसंधान परिषद के अन्य अनुसंधान संस्थान शामिल हैं। पिछले साल, हमने सभी मत्स्य पालन महाविद्यालयों के छात्रों के लिए एक अनूठा भर्ती अभियान शुरू किया, जिसमें मत्स्य पालन क्षेत्र से संबंधित कई उद्योगों के विविध समूह शामिल हुए।

संस्थान एक विषय-आधारित कार्य संस्कृति को बढ़ावा देता है, जो अनुसंधान और शैक्षणिक उत्कृष्टता पर सटीक ध्यान केंद्रित करता है। पिछले वर्षों में, हमने "ज्ञान का व्यावसायीकरण", "शैक्षणिक उत्कृष्टता" और "छात्र उद्यमिता" पर जोर दिया।

वर्ष 2024 के दौरान, संस्थान और इसके उप केंद्रों ने 86 कौशल विकास कार्यक्रम आयोजित किए, जिनमें देश के विभिन्न हिस्सों से 1970 (पुरुष-1531, महिला-439) प्रशिक्षुओं ने भाग लिया। प्रशिक्षण कार्यक्रमों में मछली का गुणवत्ता-प्रबंधन और प्रमाणन, मत्स्य स्वास्थ्य और जल-गुणवत्ता प्रबंधन, शैवाल बायोमास उत्पादन, मत्स्य आहार तैयार करने के नए तरीके, छात्रों और शोधकर्ताओं के लिए वैज्ञानिक संचार कौशल, सजावटी मछली पालन और प्रजनन, जलीय कृषि में रोगाणुरोधी प्रतिरोध आदि जैसे विविध विषयों को शामिल किया गया। मत्स्य पालन क्षेत्र के विभिन्न वर्गों जैसे किसान, उद्यमी, गुणवत्ता नियंत्रण प्रबंधक, सलाहकार, राज्य कृषि विश्वविद्यालय के संकाय और छात्र प्रशिक्षण कार्यक्रमों से लाभान्वित हुए। 38 एनईएच कार्यक्रमों के तहत लगभग 1082 (पुरुष-498, महिला-584) लाभार्थियों ने कौशल विकास प्रशिक्षण और प्रौद्योगिकी इनपुट प्राप्त किए।

अनुसूचित जाति उप-योजना के तहत, मीठे पानी की जलीय कृषि, पत्ती-आधारित मछली आहार, झींगा पालन तकनीक और जलीय आहार तैयार करने के संबंध में 2272 (पुरुष-1477, महिला-795) किसानों/छात्रों के लिए 63 प्रशिक्षण कार्यक्रम आयोजित किए गए। जनजातीय उप-योजना (टीएसपी) के तहत, 46 प्रशिक्षण कार्यक्रम आयोजित किए गए, जिसमें महाराष्ट्र, छत्तीसगढ़, मणिपुर, नागालैंड और त्रिपुरा के आदिवासी क्षेत्रों से 1715 (पुरुष-1212, महिला-503) प्रशिक्षु शामिल हुए। इसके अलावा, आदिवासी समुदायों के बीच जलीय कृषि और आय सृजन को बढ़ावा देने के लिए इस कार्यक्रम के तहत बीज, आहार, जाल और अन्य जलीय कृषि इनपुट प्रदान किए गए। वर्ष 2024 के दौरान लगभग 15 टीवी/रेडियो वार्ताएं दी गई हैं। लगभग 7490 हितधारकों ने संस्थान द्वारा प्रतिभागिता की गई 12 राष्ट्रीय और अंतर्राष्ट्रीय प्रदर्शनियों में संस्थान के प्रदर्शनी स्टाल का दौरा किया। वर्ष 2024 के दौरान कुल 3146 आगंतुकों (पुरुष-1772, महिला-1374) ने भा.कृ.अनु.प.-के.मा.शि.सं., मुंबई और इसके पांच क्षेत्रीय केंद्रों का दौरा किया।

वर्ष 2024 में संस्थान ने अनुसंधान सलाहकार समिति, संस्थागत अनुसंधान समिति, अकादमिक परिषद, विस्तार परिषद और प्रबंधन बोर्ड जैसी वैधानिक बैठकें आयोजित कीं। संस्थान ने सतर्कता जागरूकता सप्ताह, योग दिवस, स्वच्छता अभियान, हिंदी चेतना मास, उद्योग दिवस, किसान दिवस और गणतंत्र एवं स्वतंत्रता दिवस मनाया।

समाज के लिए प्रासंगिक वैज्ञानिक प्रगति करने और मत्स्य पालन पेशेवरों को तैयार करने में भा.कृ.अनु.प.-के.मा.शि.सं. के प्रयास इसके समर्पित संकाय, छात्रों और प्रशासन के कारण संभव हो पाए हैं। भारतीय कृषि अनुसंधान परिषद मुख्यालय से निरंतर समर्थन और अन्य मत्स्य पालन संस्थानों से मिले सहयोग ने देश में मत्स्य पालन के विकास को आगे बढ़ाने के संस्थान के संकल्प को और मजबूत किया है, जो निकट भविष्य में दूसरी नीली क्रांति की कल्पना करता है।

Chapter 1
Introduction


भा.कृ.अनु.प.-केन्द्रीय मात्स्यिकी शिक्षा संस्थान,मुंबई
ICAR-CENTRAL INSTITUTE OF FISHERIES EDUCATION


भा.कृ.अनु.प.-केन्द्रीय मात्स्यिकी शिक्षा संस्थान,मुंबई
ICAR-CENTRAL INSTITUTE OF FISHERIES EDUCATION

ICAR-CIFE: Educating Excellence

ICAR-Central Institute of Fisheries Education (ICAR-CIFE), Mumbai, is the first and leading national University imparting quality fisheries education under the ambit of Indian Council of Agricultural Research. It has gained a reputation as a prestigious Institution in the field of fisheries education and research over the past 60 years, producing a talented group of specialized professionals, pioneering researchers, and practical technological solutions for the benefit of fishers, fish farmers, industry and entrepreneurs. CIFE boasts state-of-art facilities in a peaceful setting and has established five regional Centres across different aqua-climatic regions in Rohtak (Haryana), Kolkata (West Bengal), Powarkheda (Madhya Pradesh), Kakinada (Andhra Pradesh), and Motipur (Bihar). Initially established in 1961 under the Ministry of Agriculture, Government of India with support from FAO/UNDP, its mandate was to strengthen the capacity of state fisheries departments and their personnel. In 1979, it became part of Indian Council of Agricultural Research (ICAR), and in 1989, it transformed into a university dedicated to education, research, and extension. The University has educated more than 2500 prominent scholars and developed the professional skills of over 5000 development professionals from India and the Afro-Asian region with a strong focus on quality education. ICAR-CIFE offers post-graduate programs in 11 specialized disciplines in fisheries and aquaculture sciences with around 100 Masters and 75 doctoral seats every year, as well as demand-driven diploma programs, certificate courses, and customized short-term training programs. ICAR-CIFE has developed an ecosystem of teaching and research excellence, making it a preferred destination for students and scholars. Its broad range of disciplines, advanced facilities, research networks within and beyond the country, and supportive work environment provide unparalleled opportunities for exploration, excellence, and leadership in shaping the future of the fisheries sector.

Mission

To achieve academic and research excellence

Vision

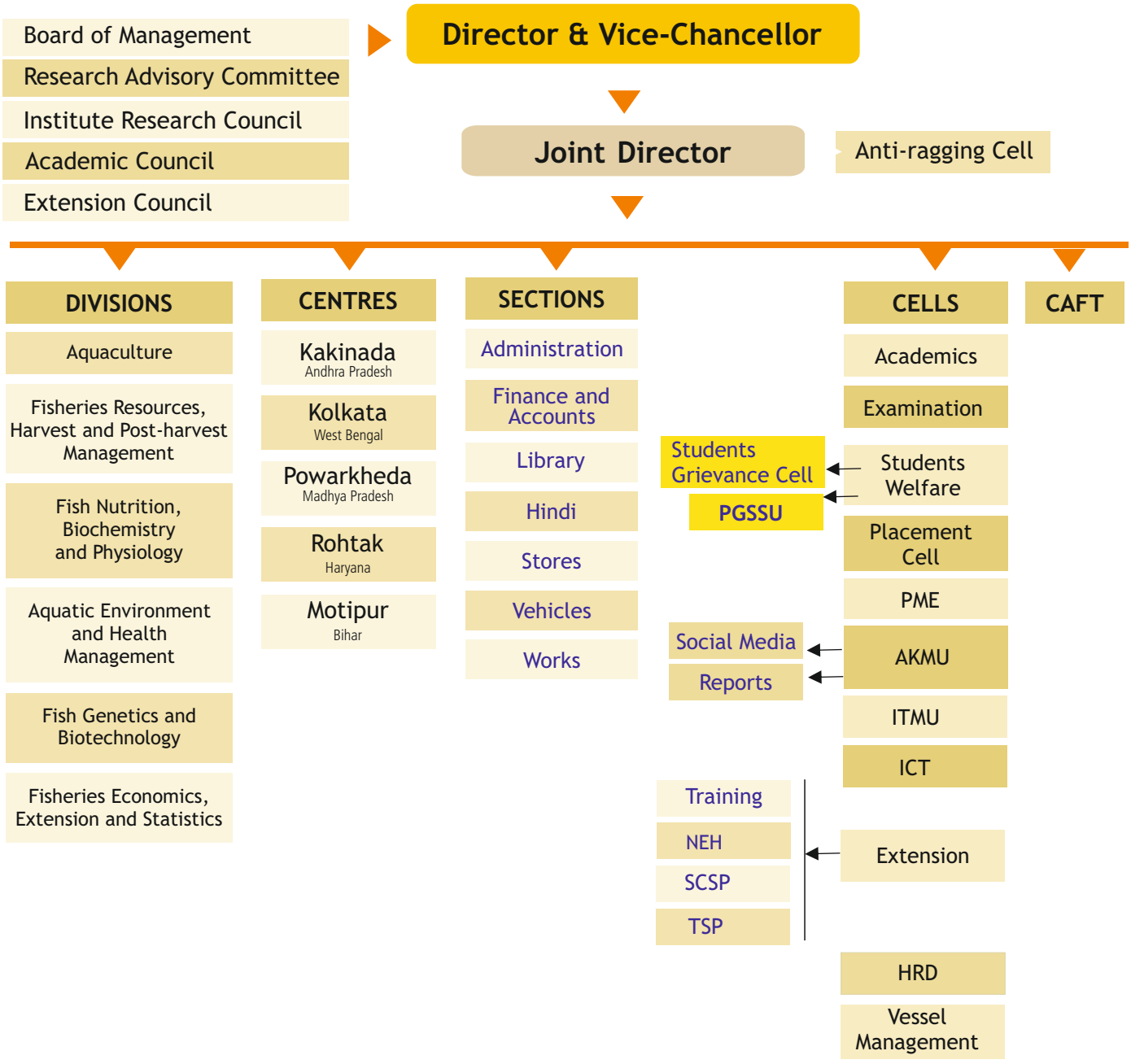
To be a world-class organisation providing leadership in fisheries education and research

Mandate

- Conduct post-graduate programmes in fisheries science
- Basic and strategic research in frontier areas of fisheries science
- Human Resource Development, capacity building and skill development through training, education & extension

Organogram

ICAR-CIFE, Mumbai



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Dr. Triveni Dutt
Dr. Punyavrat S. Pandey
Commissioner (Fisheries), Maharashtra
Dr. A. Gopalakrishnan
Dr. Kuldeep Kumar Lal
Dr. Arpita Sharma
Dr. B.B. Nayak, HOD
Joint Secretary (Finance)
Dr. Debajit Sarma
Dr. Kedar Nath Mohanta
Dr. Mukunda Goswami
Dr. Megha Kadam Bedekar
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Dr. Rupam Sharma
Dr. Swadesh Prakash
Dr. P.S. Ananthan
Dr. T.K. Srinivasa Gopal
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Commissioner of Fisheries
Joint Comm. Of Fisheries
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Dr. Shivaji Argade

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Dr. N.P. Sahu
Dean (Academics)
Dean (Students Welfare)
Head, Aquaculture Division
Head, FRHPHM Division
Head, FNFT Division
Head, AEHM Division
Head, FGB Division
Head, FEES Division
Dr. Aparna Chaudhari
Dr. B. B. Nayak
Dr. S. Jahageerdar
Dr. G .H. Pailan
Dr. K. Pani Prasad
Dr. R.P. Raman
Dr. Parimal Sardar
Dr. Rupam Sharma
Dr. Gayatri Tripathi
Dr. Ashtosh D. Deo
Dr. Ananthan P.S.
Dr. Babitha Rani A.M.
Dr. Sonwane Arvind Asaram
Dr. Gouranga Biswas
Dr. K. Syamala
Dr. Arun Sharma
Prof. (Dr.) Nazir Ah. Ganai
Dr. A. K. Singh
Dr. G. Sugumar
Dr. K. K. Lal
Dr. P.K. Sahoo
Dr. Triveni Dutt
Dr. S.D. Sawant
Student Member, ICAR-CIFE

Member Secretary
Joint Secretary (CIFE)

3.3. Sanctioned Cadre Strength of CIFE as on 31st December 2024

Category Wise

CIFE Staff	Sanctioned	In position	Vacant
RMP	02	02	00
Scientist	109	82	27
Technical	104	51	53
Administrative	76	45	31
Skilled Support Staff	46	17	29
Total	**337**	**197**	**140**

3.4. Budget (2024-25)

Rs. in Lakhs

S. No.	Head	Sanctioned/ Balance C/f	Received	Expenditure Incurred
1.	Institute Expenditure including TSP and NEH		11065.00	11065.00
2.	SDU	-	1410.00	1410.00
3.	Scheduled Caste Sub-Plan (SCSP)	-	260.00	260.00
4.	NAHEP	-	50.00	50.00
5.	Externally Funded Projects	415.61	1030.57	686.80
	Total	**415.61**	**13815.57**	**13471.80**

Revenue Generation

Rs. in Lakhs

Financial Year	Revenue Target	Revenue Generation
2024-25	150.00	159.16

Chapter 2
Academic Achievements

Highlights

Number of Students Enrolled During the Year 2024 (1 January-31 December, 2024)

M.F.Sc. 96

Ph.D. 60

Number of Successful Students During the Year 2024 (1 January-31 December, 2024)

M.F.Sc. 92

Ph.D. 46

31

Awards Received by Students

35

Papers Presented by Students in Conferences/ Symposia etc.

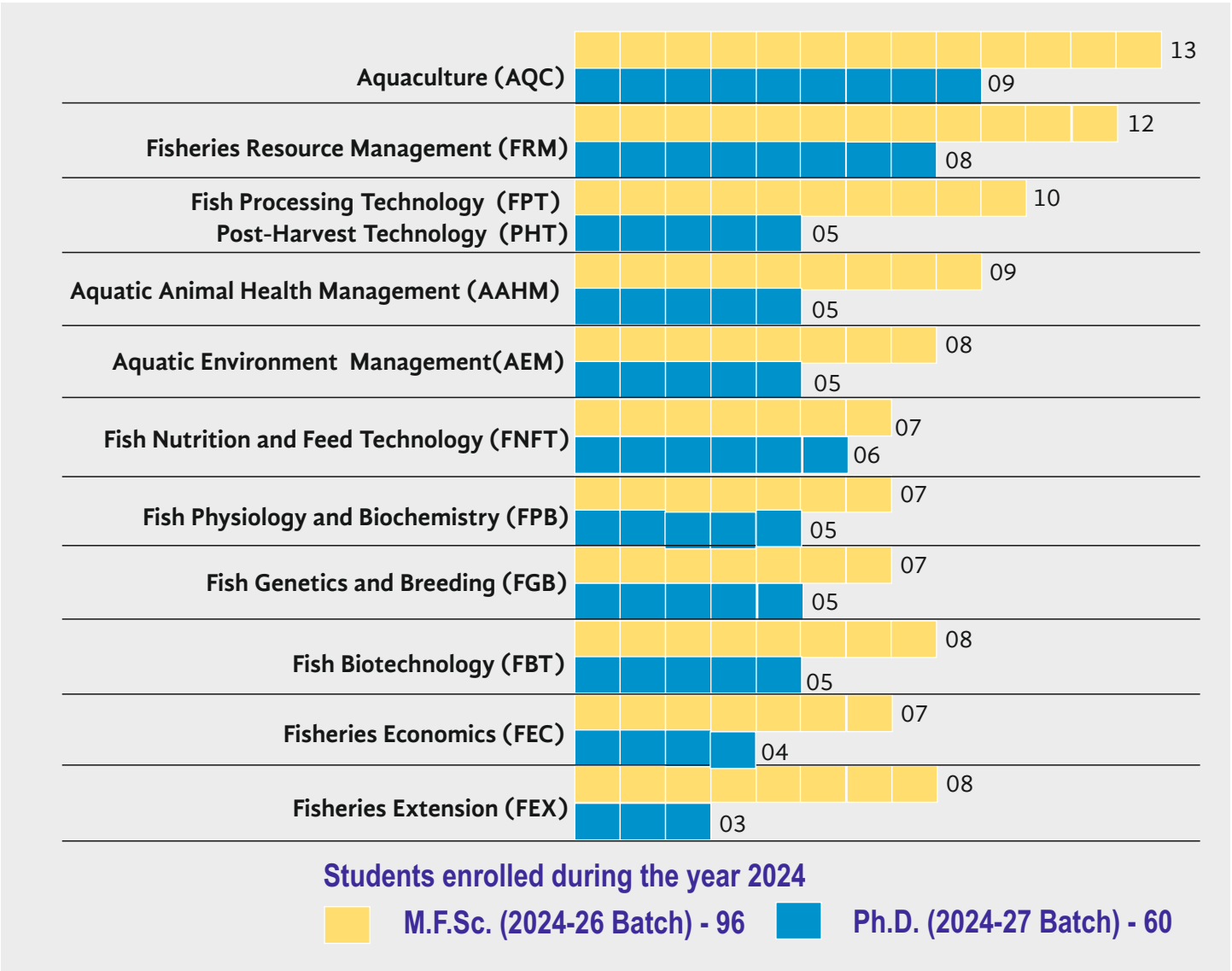
45

Placement

2.1 Enrollments

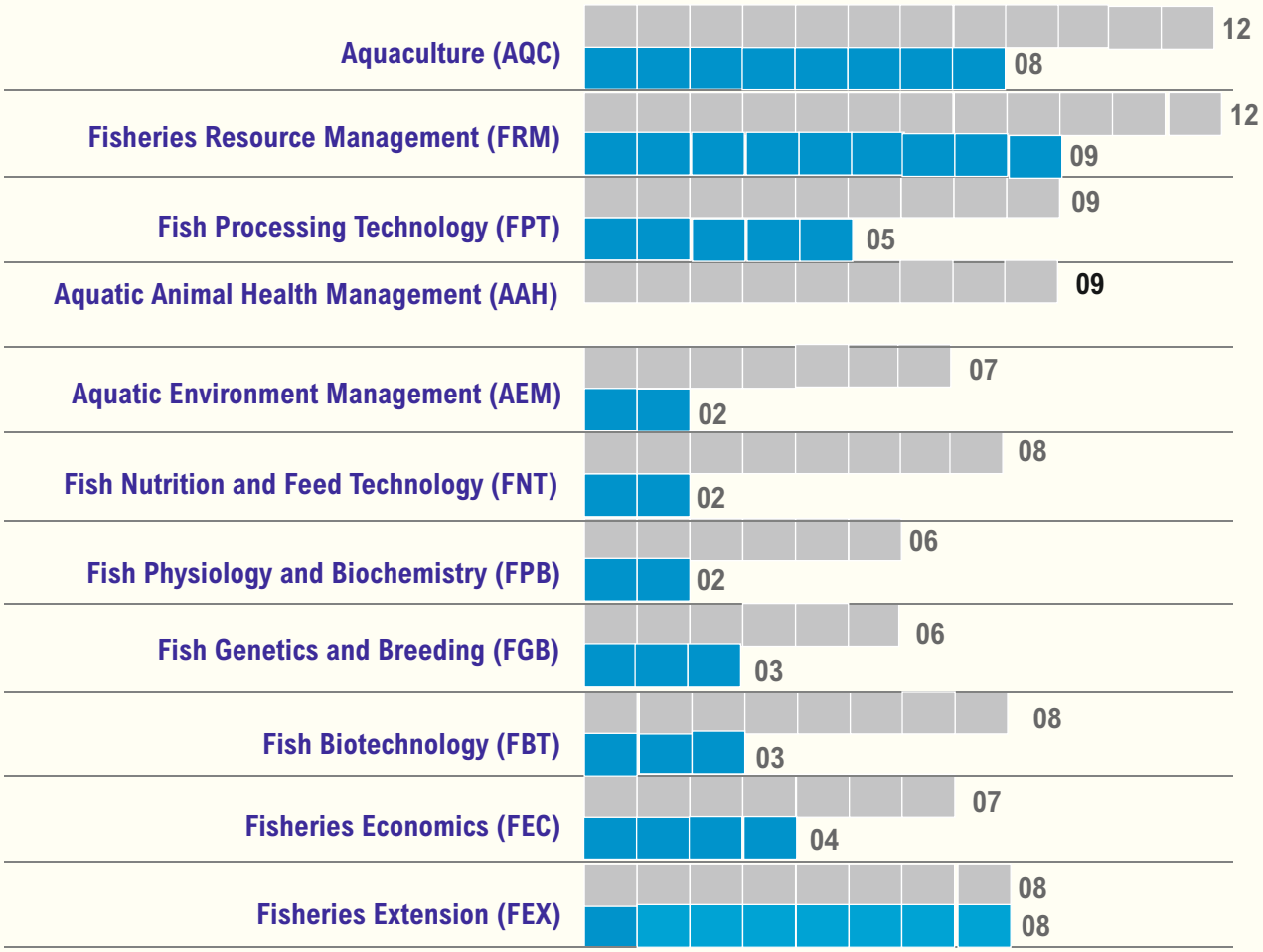
A total of 96 students have enrolled for the MFSc programme and 60 have enrolled for the doctoral programme.

List of students enrolled during the academic year 2024-2026



2.2 Results

List of Successful students during the year 01 Jan 2024 - 31 December 2024



List of dissertations submitted by M.F.Sc. students (Batch 2022-2024): 92

No. of students awarded Ph.D. degree during 1 January - 31 December 2024: 46

2.3. Students awarded M.F.Sc. and research titles (2024)

Aquaculture

1. **Aarya Priya**
AQC-MB2-01
Effect of a flavonoid compound, quercetin on growth and captive maturation of highfin barb, *Oreichthys crenuchoides* (Schäfer, 2009)
Dr. Gouranga Biswas

2 **Anusiya P.**
AQC-MB2-02
Effects of ionic manipulation on growth and survival of white leg shrimp, *Penaeus vannamei* (Boone 1931) reared in inland saline- sodic water of Maharashtra
Dr. Kapil Sukhdhane

3 **Atul Kumar Singh**
AQC-MB2-03
Substratum dependent reproductive dynamics of *Notopterus notopterus* (Pallas, 1769) in captive rearing condition
Dr. Debajit Sarma

4 **Bishu Das**
AQC-MB2-04
Assessment of phytoremediation potential of selected aquatic ornamental plants in populated aquariums
Dr. Paramita B. Sawant

5 **Chauhan Nidhiben Haribhai**
AQC-MB2-05
Exogenous hormonal manipulation on oozing out of milt in male *Clarias magur* (Hamilton, 1822)
Dr. Thongam Ibemcha Chanu

6 **Maria Jose**
AQC-MB2-07
Effect of LHRHa hormone pellet implantation on prematuration of *Anabas testudineus* (Bloch, 1792)
Dr. Prem Kumar

7 **Prachurjya Das**
AQC-MB2-08
Evaluation of different culture media for the optimum production of *Tubifex tubifex* (Muller,1774) in recirculating rearing unit
Dr. Upasana Sahoo

8 **Rohit Raj**
AQC-MB2-09
Co-culture efficiency of Gracilaria foliifera (Forsskal) Borgesen, 1932 with *Penaeus vannamei* (Boone, 1931) in culture ponds
Dr. Madhuri S. Pathak

9 **S. T. Zhaiveilou**
AQC-MB2-10
Mapping and characterisation of low saline water and sodic soil for aquaculture development in Vidarbha region of Maharashtra
Dr. Munil Kumar Sukham

10 **Sneha Sathyan G.**
AQC-MB2-11
Effect of cow manure extract supplementation on growth performance and physiological responses of *Channa striata* (Bloch, 1793) and pak choi (Brassica chinensis) in aquaponics
Dr. A.K. Verma

11 **Sureesh S.**
AQC-MB2-12
Evaluation of de-oiled palm kernel meal (DPKM) based biomimetic systems in *Penaeus vannamei* (Boone, 1931) culture
Dr. Karthireddy Syamala

12 **Vidya. K.**
AQC-MB2-13
Optimization of feeding for improved growth and gonadal maturation of the indigenous golden killifish *Aplocheius lineatus* (Valenciennes. 1846)
Dr. Paramita B. Sawant

Fisheries Resource Management

1 **Amin Binth Basheer**
FRM-MB2-01
Assessment of fish diversity in the Sardar sarovar reservoir along Maharashtra
Dr. A.K. Jaiswar

2 **Ashpel Mano**
FRM-MB2-02
Appraisal of Jellyfish blooms occurrence along the coast of Maharashtra
Dr. Asha T. Landge

3 **Debashis Mohanta**
FRM-MB2-03
Assessment of trophic structure on Sardar sarovar reservoir along Maharashtra
Dr. Karankumar K. Ramteke

4 **Kottapalli Nikhil**
FRM-MB2-05
Studies on life cycle assessment and energy use of stationary bagnet fishing system along Mumbai coastal waters
Dr. Asha T. Landge

5 **Sangeeta Beck**
FRM-MB2-06
Trophic guild structure of fish community in the middle stretch of the Ulhas river, Maharashtra
Dr. Sukham Monalisha Devi

6 **Sumanta De**
FRM-MB2-07
Fish assemblage and trophic guild structure of Thane creek, an Urban Ramsar site
Dr. Shashi Bhushan

7 **Suryapraba V.**
FRM-MB2-08
Enhancement of nutrient content of *Nannochloropsis* spp. through culture manipulation and possible transfer to bivalve
Dr. B.B. Nayak

8 **Sushmitha B.R.**
FRM-MB2-09
Integrated taxonomy of fishes of the genus *Garra* (Hamilton, 1822) (Cyprinidae: Labeoninae) occurring in selected rivers of Maharashtra
Dr. Sukham Monalisha Devi

9 **Treesa Maria Thomas**
FRM-MB2-10
A study on the reproductive biology of selected species of fishes from Sardar sarovar reservoir along Maharashtra
Dr. A.K. Jaiswar

10 **Vineet Anand**
FRM-MB2-11
Trophic guild structure of pelagic fish community of Mumbai Coast, Maharashtra
Dr. Shashi Bhushan

12 **Nandoskar Mahadev Vilas**
FRM-MB2-12
Evaluation of stationary bag net fishery along Alibag coast, Raigad, Maharashtra
Dr. Karankumar Ramteke

Fish Processing Technology

1 **Aiswarya R Krishnan**
FPT-MB2-01
Application of a viability PCR assay for detection of live *Salmonella enterica* in shrimps.
Dr. Manjusha L.

2 **Aman Kumar Mishra**
FPT-MB2-02
Development of freshness prediction models for Labeo rohita (Hamilton,1822) and *Penaeus vannamei* (Boone, 1931) stored in ice
Dr. Layana P.

3 **Anusree V.**
FPT-MB2-03
Extraction of oil from tuna and its quality evaluation during storage
Dr. Deepitha R.P.

4 **Devi Prasad Panda**
FPT-MB2-04
Effect of different stresses on colour bacterioruberin and halocin production by archaea from salt fermented fish
Dr. B.B. Nayak

5 **Murabiya Udit Maheshbhai**
FPT-MB2-05
Development of a solid growth medium for *Vibrio* spp. using fish waste-derived peptone
Dr. Sanath Kumar H.

6 **Nada Fathima K.**
FPT-MB2-06
Natural extracts-based hurdle application for enhanced microbial quality of fresh fish
Dr. Manjusha L.

7 **Pallavi Bhalavey**
FPT-MB2-07
Characterization of chitinases produced by selected microbes isolated from shrimp waste
Dr. B.B. Nayak

8 **Praseed Sarkar**
FPT-MB2-08
Effect of brown seaweed (*Sargassum wightii)* inclusion on nutritional quality and storage stability of fish mince based product
Dr. Hanjabam Mandakini Devi

9 **Purva Sharan**
FPT-MB2-09
Comparative emulsifying efficiency of different forms of fish myofibrillar protein in *Pangasius* oil-in water emulsion
Dr. Layana P.

Fish Genetics and Breeding

1 **Adithya B.S.**
FGB-MB2-01
Model development to predict the best age for the genetic selection for the growth in Maha magur
Dr. Shrinivas Jahageerdar

2 **Anjali Kumari**
FGB-MB2-03
Estimation of genetic variation in growth-related genes of selectively bred population of common carp, *Cyprinus carpio* (Linnaeus, 1758)
Dr. Mujahidkhan A. Pathan

3 **Bharathkumar K.**
FGB-MB2-04
Effect of PLGA *nanoconjugated kisspeptin* on reproductive performance of *Labeo catla* (Hamilton, 1822)
Dr. Rupam Sharma

4 **Inpent Campal E.**
FGB-MB2-05
Evaluation of genotoxicity potential of nanoplastics in forked venus clam *Gafrarium divaricatum* (Gmelin, 1791) using cytogenetic and molecular markers
Dr. Naresh S. Nagpure

5 **Kotagiri Shivarama Krishna**
FGB-MB2-06
Genetic analysis of growth and survival traits across the grow-out period of Maha Magur
Dr. Shrinivas Jahageerdar

6 **Rajaram Hansda**
FGB-MB2-07
Performance evaluation of early growth traits of *Labeo rohita* (Hamilton,1822) in a cohort breeding programme
Dr. Sunil Kumar Nayak

Fish Biotechnology

1 **Banothu Divya**
FBT-MB2-01
Temperature stress induced gene expression changes in Bivalve *Gafrarium divaricatum* (Gmelin,1791)
Dr. Manoj P. Brahmane

2 **Bipasha Nandi**
FBT-MB2-02
Differential protein expression analysis of selected tissues of *Labeo rohita* (Hamilton, 1822)
Dr. Mukunda Goswami

3 **Borra Tejaswi**
FBT-MB2-03
Molecular characterization of RGR platform-mediated targeted transgenesis in zebrafish, *Danio rerio* (Hamilton, 1822)
Dr. Arvind A. Sonwane

4 **Siyag Anant Dhere**
FBT-MB2-04
Understanding gene regulation in *Anabas testudineus* (Bloch 1972) during exposure to monocrotophos
Dr. Kiran D. Rasal

5 **Rinu Fathima**
FBT-MB2-05
Isolation and characterization of myosatellite cells from *Clarias magur* (Hamilton, 1822)
Dr. Mukunda Goswami

6 **Sajan D.**
FBT-MB2-06
Expression profiling of the genes associated with PUFA biosynthesis and immune system in *Channa striata* (Bloch, 1793)
Dr. Jitendra Kumar Sundaray

7 **Sushmitha K. M.**
FBT-MB2-07
Evaluation of selected type I microsatellite loci of *Clarias magur* for growth-relatedness
Dr. Aparna Chaudhari

8 **Tuturanjan Gogoi**
FBT-MB2-08
Taxonomy and phylogeny of the family Dasyatidae using morphological and molecular markers
Dr. Annam Pavan Kumar

Fish Nutrition and Feed Technology

1 **Avanthika G.**
FNFT-MB2-01
Utilization of green pea pod meal (GPM) in the diet of *Labeo rohita* (Hamilton,1822) fingerlings
Dr. Shamna N.

2 **Avvari Venkata Sai**
FNFT-MB2-02
Replacement of fish meal with blended protein sources in the diet of *Anabas testudineus* (Bloch, 1792) fingerlings
Dr. Kedar Nath Mohanta

3 **Jenisha Mol J. G.**
FNFT-MB2-03
Nutritional evaluation of Mahua protein concentrate in the diet of *Labeo rohita* (Hamilton, 1822) fingerlings
Dr. Manish Jayant

4 **Megha S. Vinod**
FNFT-MB2-04
Combined effect of propylene glycol and L-carnitine on feed intake growth and survival of *Pangasianodon hypophthalmus* (Sauvage, 1878) reared at low temperature
Dr. Ashutosh D. Deo

5 **Pankaj Kumar Singh**
FNFT-MB2-05
Combinatorial effect of dietary conjugated linoleic acid and quercetin on feed intake, growth and survival of *Pangasionodon hypopthalamus* (Sauvage, 1878) fingerling reared at low temperature
Dr. Ashutosh D. Deo

6 **Patel Suraj Piyushkumar**
FNFT-MB2-06
Evaluation of selected ingredients and additives as attractants in the diet of *Heteropneustes fossilis* (Bloch, 1794)
Dr. MD Aklakur

7 **Samrat Kumar Nirala**
FNFT-MB2-07
Combinatorial effect of selected lipid utilizing nutraceuticals on the growth performance & physio-metabolic responses of gift (*Oreochromis niloticus*) juveniles reared in inland saline water
Dr. Parimal Sardar

8 **Simon Sandey**
FNFT-MB2-08
Evaluation of protein concentrate from black soldier fly larvae (BSFL) in the diet of *Penaeus vannamei* (Boone,1931) juveniles
Dr. Shamna N.

Fish Physiology and Biochemistry

1 **Anu Baiju**
FPB-MB2-01
Evaluating the effect of social hierarchies and hyperthermal stress in all-male *Oreochromis niloticus* (Linnaeus, 1758)
Dr. Tincy Varghese

2 **Banu Dharshini M.**
FPB-MB2-02
Eubiotic effect of mannan oligosaccharide and potassium diformate supplementation in the diet of *Labeo rohita* (Ham., 1822) fingerlings
Dr. Subodh Gupta

3 **Dhivakar V.**
FPB-MB2-03
Effect of Bisphenol-A on ovarian development and reproductive hormonal profile of *Anabas testudineus* (Bloch, 1792)
Dr. Prem Kumar

4 **Haridarshan Thakur**
FPB-MB2-04
Effect of crowding stress on physio-metabolic and gut immune responses in *Labeo rohita* (Hamilton, 1822) fingerlings
Dr. Dilip Kumar Singh

5 **Sonali Kumari**
FPB-MB2-06
Comparative evaluation of invasive and non-invasive methods against crowding stress in *Pangasianodon hypophthalmus* (Sauvage, 1878) fingerlings
Dr. Sujata Sahoo

6 **Subashini M.**
FPB-MB2-07
Responses of dietary folic acid on gonadal recrudescence and maturation in female *Anabas testudineus* (Bloch, 1792) exposed to hyperthermal stress
Dr. G.H. Pailan

Aquatic Environment Management

1 **Ajeet Singh Dhakad**
AEM-MB2-01
Mapping and characterization of deep pools in seasonal river Parvati in central India using geospatial tools
Dr. Vidya Shree Bharti

2 **Anika Namdeo**
AEM-MB2-02
Assessment of biochar-nano fertilizer composite on the growth of *Cyprinus carpio* (Linnaeus, 1758) reared in inland saline aquaculture system
Dr. Vidya Shree Bharti

3 **Khandu Doma Bhutia**
AEM-MB2-03
Designing and performance evaluation of a fixed-bed column filtration system for simultaneous removal of microplastic and triclosan
Dr. S.P. Shukla

4 **Mayuri Nag**
AEM-MB2-04
A study on amelioration of triclosan induced toxicity in *Labeo rohita* using *microalgae Spirulina* (Arthrospira) *platensis*
Dr. Saurav Kumar

5 **Mekala Sneha**
AEM-MB2-05
Effects of nano fertilizers (Urea and Di Ammonium Phosphate) on haemato-physiological parameters of *Labeo rohita* (Hamilton. 1822)
Dr. Saurav Kumar

6 **Rajiv Ranjan**
AEM-MB2-06
Development of filtration prototype for triclosan removal using bacterial consortia
Dr. Kundan Kumar

7 **Routhu Urmila Devi**
AEM-MB2-07
Toxicity evaluation of e-waste leachate in selected freshwater microalgae and development of column filtration system for the remediation of the leachate
Dr. S.P. Shukla

Aquatic Animal Health Management

1 **Adarsh K .**
AAHM-MB2-01
In vitro screening of selected heterotrophic bacteria against pathogenic *Vibrio* spp. prevalent in inland saline shrimp farming system
Dr. Sreedharan K.

2 **Astha Deshmukh**
AAHM-MB2-02
Establishment of an in vitro model for the evaluation of trained immunity
Dr. Jeena K.

3 **Chandru G.**
AAHM-MB2-03
Assessment of antibacterial efficacy of Indian Almond, *Terminalia catappa* Linn. leaf extract in *Anabas* testudineus (Bloch. 1792) against selected bacterial pathogen and nitrifying bacteria
Dr. Arun Sharma

4 **Gulapi Bada**
AAHM-MB2-04
Characterization of Vibrio spp. associated with White Faecal Syndrome (WFS) in inland saline-farmed Pacific white shrimp. *Penaeus vannamei*
Dr. Sreedharan K.

5 **Md. Tausique Raza**
AAHM-MB2-05
Optimization of molecular method for screening of tilapia parvovirus (TiPV) in farmed tilapia
Dr. Megha Kadam Bedekar

6 **Shaik Fazulun**
AAHM-MB2-06
Screening of emerging viral pathogen(s) infecting freshwater ornamental cyprinids in India
Dr. Jeena K.

7 **Shaik Haseena**
AAHM-MB2-07
Pharmacokinetics and HSP 70 gene expression on administration of Ivermectin to common carp (*Cyprinus carpio*)
Dr. Arun Sharma

8 **Suraj Saha**
AAHM-MB2-08
Screening of infectious spleen and kidney necrosis virus (ISKNV) from susceptible fish species in Maharashtra
Dr. Megha Kadam Bedekar

9 **Yashwee Shrivastava**
AAHM-MB2-09
Isolation and characterization of bacterial pathogens from freshwater farmed Asian seabass. *Lates calcarifer*
Dr. Gayatri Tripathi

Fisheries Economics

1 **Aatepogu Revathi**
FEC-MB2-01
Fish consumer behavior and drivers of fish consumption in selected fish markets of Hyderabad, Telangana
Dr. Swadesh Prakash

2 **Angelina Gurung**
FEC-MB2-02
Value chain analysis of Trout culture in Sikkim
Dr. Neha Wajahat Qureshi

3 **Benu Kumari**
FEC-MB2-03
Fish consumption behavior and drivers of fish consumption in Mumbai, Maharashtra
Dr. Swadesh Prakash

4 **Mahesh Sharma**
FEC-MB2-04
Economic costs of shrimp diseases and development of disease prediction model using computer vision & machine learning
Dr. Vinod Kumar Yadav

5 **Ranjana Choudhury**
FEC-MB2-05
Mapping and economic valuation of blue carbon potential of mangrove areas along Palghar coast. Maharashtra
Dr. Vinod Kumar Yadav

6 **Samiran Mukherjee**
FEC-MB2-06
Ecosystem Valuation and Human development of fish farmers in east Kolkata Wetlands, a Ramsar site
Dr. Neha Wajahat Qureshi

7 **Vinitha S.**
FEC-MB2-07
Fish buying and consumption behaviour of consumers in Thoothukudi District of Tamil Nadu
Dr. Ankush L. Kamble

Fisheries Extension

1 **Divya K**
FEX-MB2-01
Attitude to tilapia in India: A socio-cultural inquiry
Dr. Ananthan P.S.

2 **Khimsali Difoe**
FEX-MB2-02
Governance assessment of multi-level fisheries cooperatives in Assam
Dr. Shivaji Argade

3 **Khushboo Kumari**
FEX-MB2-03
Governance assessment of multi-level fisheries cooperatives in Bihar
Dr. Shivaji Argade

4 **Nitika Singh**
FEX-MB2-04
State bifurcation and fisheries sector: Development performance in Chhattisgarh and Madhya Pradesh
Dr. Ananthan P.S.

5 **Pugazhenthi P.**
FEX-MB2-05
Governance assessment of multi-level inland fisheries cooperatives in Tamil Nadu
Dr. Shivaji Argade

6 **Sayantan Das**
FEX-MB2-06
Occupational hazards faced by fish and shrimp farm workers in West Bengal
Dr. Arpita Sharma

7 **Vijendra Kumar**
EX-MB2-07
Impact of cage culture on the livelihoods of fishers in the Sardar sarovar reservoir, Maharashtra
Dr. Arpita Sharma

8 **Zayeema Karim**
FEX-MB2-08
State bifurcation and fisheries sector: Development performance in Jharkhand and Bihar
Dr. Ananthan P.S.

2.4. List of students awarded Ph.D. degree during 01 Jan 2024 to 31 December 2024

1 **Ms. Madhurima A. Jadhav**
PHT-PA6-04
Effect of commonly used additive(s) on the rheological and functional properties of Bombay Duck (*Harpodon Nehereus*) mince
Dr. B.B. Nayak
8/1/2024

2 **Mr. Abhijit Mallik**
FRM-PA9-02
Study of reproductive potential and feeding adaptations of fishes collected from selected sites off Maharashtra, Eastern Arabian Sea
Dr. Shashi Bhushan
5/2/2024

3 **Mr. Rajeshwaran M.**
FEX-PA8-05
Livelihood assessment of inland and marine small scale fishers in Tamil Nadu
Dr. S.N. Ojha
6/2/2024

4 **Mr. Gyandeep Gupta**
FPB-PA7-01
Studies on vitellogenin profile and follicular maturation in *Clarias magur* (Hamilton, 1822) fed with selected feed additives
Dr. P.P. Srivastava
9/2/2024

5 **Mr. Sanjenbam Bidyasagar Singh**
FRM-PA8-05
Trophic relationship and ecosystem functioning of Maphou Reservoir, Manipur
Dr. Geetanjali Deshmukhe
12/2/2024

6 **Mr. Velumani T.**
FEX-PA7-02
Framework for assessing the vulnerability of Inland Fisheries
Dr. Ananthan P.S.
19/02/2024

7 **Mr. Rathod Kumara**
AQC-PA9-11
Assessment of sustainable halophyte based Integrated Multi-Trophic brackishwater aquaculture Models
Dr. Muralidhar P. Ande
20/02/2024

8 **Ms. Priyanka C. Nandanpawar**
FGB-PA8-03
Identification of genes associated with performance traits in selectively bred "Jayanti" rohu, *Labeo rohita* (Hamilton, 1822)
Dr. Paramananda Das
21/02/2024

9 **Mr. S. Kesavan**
FRM-PA8-01
Impact assessment and quantification of marine debris in mangrove ecosystems of Mumbai
Dr. Martin Xavier K.A.
11/3/2024

10 **Ms. Rupali Das**
PHT-PA9-06
Development of ready-to eat sous-vide shrimp products with improved quality using chitosan
Dr. Martin Xavier K.A.
11/3/2024

11 **Ms. Rakhi Das**
FNFT-PA9-05
Evaluation of glycerol monolaurate and leonardite humic acid in low protein high energy diet of *Penaeus vannamei* (Boone,1931) juveniles reared in inland saline Water
Dr. N.P. Sahu
22/03/2024

12 **Mr. Rajiv Hanumantrao Rathod**
FEX-PA7-04
Livelihood impact assessment of fisheries development programmes in Vidarbha region (Maharashtra)
Dr. Arpita Sharma
2/5/2024

13 **Ms. Lekshmi S.**
PHT-PA7-04
Development of seaweed fortified fish products with enhanced nutritional quality and stability
Dr. A.K. Balange
3/5/2024

14 **Ms. Nidhi Katre**
FEX-PB0-06
Development of governance quality index for assessment of reservoir fisheries governance in Madhya Pradesh
Dr. Arpita Sharma
13/05/2024

15 **Ms. Kanchi Bhargavi**
FRM-PA8-11
Impact of research, development and Governance on the reservoir fisheries and fishers in Telengana
Dr. P. Krishnan
22/05/2024

16 **Ms. Jerusha S.**
PHT-PA7-02
Occurrence of salmonella-specific phages in seafood environment and their applications
Dr. Sanath Kumar H.
27/05/2024

17 **Ms. Atufa Regu**
FEX-PA9-02
Gendered analysis of value chain & ecosystem services in walur lake, Jammu & Kashmir
Dr. Ananthan P.S.
29/05/2024

18 **Mr. Girkar Milind Madhukar**
AEM-PA9-04
Development of column bed filtration systems for the removal of fluoride from groundwater
Dr. S.P. Shukla
24/06/2024

19 **Mr. Mohammad Ashraf Malik**
FPB-PB0-02
Nano-formulation of GnRH analogues for induced breeding of commercially important fish species
Dr. Subodh Gupta
3/7/2024

20 **Ms. Naila Majid**
FEX-PB0-02
Fisheries extension intensity and development in Haryana and Punjab: assessment and action plan
Dr. Ananthan P.S.
5/7/2024

21 **Ms. Meenu Devassykutty**
AQC-PA7-02
Growth, survival and stress response of juvenile silver pompano, *Trachinotus blochii* (Lacepede, 1801) fed with selected nutraceuticals
Dr. Boby Ignatius
8/7/2024

22 **Ms. Puja Chakarborty**
AQC-PA9-01
Nanotechnological interventions for detoxification of priority chemical and bacterial contaminants
Dr. Kishore Kumar Krishnani
12/7/2024

23 **Mr. Shakir Ahmad Mir**
FEX-PA9-01
Inland shrimp aquaculture: ecological externalities and trade-off with agriculture in Haryana and Punjab
Dr. Ananthan P.S.
16/07/2024

24 **Mr. Khemraj Bunkar**
FEC-PA8-02
The interplay of economics, human development and governance in reservoir fisheries of Chambal valley
Dr. Ananthan P.S.
1/8/2024

25 **Ms. Gomathy V.**
FEC-PA7-01
Market integration, the trade barriers, and substitution in global shrimp markets
Dr. Ananthan P.S.
12/8/2024

26 **Mr. Shyam Datta Waghmare**
FEC-PBO-03
Economic and environmental assessment of tilapia - sugarcane production system in Ujjani reservoir command area, Maharashtra
Dr. Swadesh Prakash
20/08/2024

27 **Mr. Santosh Narayan Kunjir**
FEX-PA9-06
Mapping of intellectual property rights in indian fisheries sector and innovativeness of fisheries professionals
Dr. Arpita Sharma
30/08/2024

28 **Mr. Shahid Gul**
FEC-PA9-03
Ecosystem services, fisheries resource management and trade-offs in river Jhelum basin
Dr. Swadesh Prakash
4/9/2024

29 **Ms. Sneha Surendran**
FGB-PA7-02
Biogenic synthesis and pharmacokinetics studies of carbon nanotubes in zebrafish, *Danio rerio* (Hamilton, 1822)".
Dr. Rupam Sharma
10/9/2024

30 **Ms. Aswathy Ashokan**
AEM-PA7-01
Bioprospecting of seaweeds for extraction of phlorotannins with efficacy against microbial contaminants and biofouling microorganisms
Dr. S.P. Shukla
11/9/2024

31 **Ms. P. Chellamanimegalai**
FRM-PA9-08
Taxonomy and biochemical analysis of genera Dictyota and Padina (Dictyoaceae, Phaeophyta) along Indian Coast
Dr. Geetanjali Deshmukhe
19/09/2024

32 **Mr. A. Sathiyanarayanan**
FBT-PA8-03
Development of a synthetic peptide vectoe and assessment of *in vitro* transfection efficiency
Dr. Mukunda Goswami
30/10/2024

33 **Ms. Jesna P.K.**
AQC-PA8-09
Investigation on ectoparasite remediation using nano/micro-encapsulated formulation in cultured fish
Dr. B.K. Das
6/11/2024

34 **Ms. Rakhi Kumari**
FNFT-PA8-04
Ontogeny of gastrointestinal tract and digestive enzymes during larval development and subsequent responses to diets in striped Murrel *Channa striata* (Bloch, 1793) larvae
Dr. K. N. Mohanta
8/11/2024

35 **Mr. Anantharaja K.**
AQC-PA8-13
Production performance of *Hypselobarbus pulchellus* (Day, 1870) in biofloc based seed rearing system
Dr. P. Routray
11/11/2024

36 **Mr. P.Ramakrishna Reddy**
PHT-PA8-02
Application of haloarchaea and haloarchaeal extracts in fish preservation
Dr. B.B. Nayak
12/11/2024

37 **Mr. Rahul Das**
AQC-PA8-11
Evaluation of growth performance of *Pangasianodon hypophthalmus* (Sauvage, 1878) in cages using vanya silk worm pupase based feed
Dr. Basanta Kumar Das
13/11/2024

38 **Mr. Jeevan T.M.**
FRM-PA9-05
Taxonomy, phylogeny and population structure of barbs of the genus *Hypeselobarbus Bleeker* 1860 (Teleostei : Cyprinidae)
Dr. A.K. Jaiswar
14/11/2024

39 **Ms. Sahina Akter**
FRM-PA9-07
Impact of oceanographic parameters on primary productivity and phytoplankton diversity of selected sites off Maharashtra Coast
Dr. Geetanjali Deshmukhe
18/11/2024

40 **Mr. Uday Kumar Udit**
AQC-PA7-12
Visceral and subcutaneous fat accumulation and its implication on gonad maturation in catla (*Catla catla*, Ham.) brood female
Dr. Samiran Nandi

21/11/2024

41 Ms. Riya Kumari
FGB-PA7-01
Development of a genotoxicity assay system for evaluation of antibiotics using *Danio rerio* (Hamilton, 1822)
Dr. Naresh S. Nagpure
27/11/2024

42 Mr. Rinchen Nopu Bhutia
FRM-PA7-06
Fish trophic guild and food web structure of Matla Estuary, Northeastern Coast of India
Dr. Geetanjali Deshmukhe
29/11/2024

43 Ms. Sonal Suman
FBT-PA8-01
Identification and characterization of pearl formation-related genes in *Lamellidens marginalis* (Lamarck, 1819)
Dr. Pavan Kumar
2/12/2024

44 Mr. Pradeep Kumar Singh
AQC-PA9-14
Mass production and nutrient enrichment of *Brachionus calyciflorus* (Pallas, 1766) for fish larviculture
Dr. Sukham Munilkumar
9/12/2024

45 Mr. Suman Nama
FRM-PA9-06
Identification and assessment of Ichthyoplankton along the selected sites off Maharashtra
Dr. B.B. Nayak
27/12/2024

46 Mr. Thushar P. Kumar
FBT-PA7-02
Molecular characterization and localization of kisspeptin system in *Clarias magur*
Dr. Aparna Chaudhari
30/12/2024

2.5. ICAR-CIFE celebrates its XVII Convocation Ceremony on 05 April 2024

ICAR-CIFE is a Centre of Excellence in Fisheries Higher Education in the country. It also has the reputation of being the only university in the world that produces master's and doctoral students in 11 highly specialized disciplines of fisheries. It has also developed many technologies to promote the fisheries sector in the country. ICAR-CIFE celebrated its convocation to confer degrees on 05 April 2024. In this convocation, Director and Vice Chancellor of ICAR-CIFE, Dr. Ravishankar C.N., conferred degrees on 90 Master's and 32 Ph.D. students. Dr. N. Kalaiselvi, Director General, Council of Scientific & Industrial Research & Secretary, Department of Science and Industrial Research, Govt. of India, was the Chief Guest of the function, and Guests of Honour, Dr. R. C. Agarwal, Deputy Director General (Education Division), ICAR, and Dr. Joykrushna Jena, Deputy Director General (Fisheries Science), ICAR also graced the occasion. The Chief Guest lauded the role of professional fisheries education in supporting a thriving and rapidly growing sector that employs up to 28 million people across India. The increasing contribution of aquaculture in the total production of 16.24-million-ton fish in 2022, implies growing entrepreneurial activity in this sector. This indicates that effective technologies are being developed and applied and India continues to be the second largest producer of fish in the world. The sector contributes to nearly 1.2% of India's GDP, and export earnings reached Rs. 64,000 crores during 2023. Over the past five years Pradhan Mantri Matsya Sampada Yojana (PMMSY) of Govt of India, has supported 31.89 lakh fishers and farmers from 22 states and seven UTs under insurance coverage and an additional 6.77 lakh fishers have been covered for livelihood and nutritional support during the lean/ban period. This scheme has borne fruit through adoption of innovations and modern technology,

improved safety and quality of fish, cold-chain, development of post-harvest infrastructure, modernised value chain and traceability, scientific framework of fisheries management, and welfare of fisherfolk. The role of fisheries education and professionals is vital in this transformative journey of making India a leading producer and consumer of quality fish in the world. Dr. Kalaiselvi also appreciated the significant contribution ICAR-CIFE made in developing energy-efficient and environmentally friendly technologies for inland saline aquaculture. As an outcome of CIFE's sustained efforts, about 2500 farmers in Haryana, Punjab, Rajasthan and Uttar Pradesh have adopted P. vannamei shrimp aquaculture with active involvement of State governments. CIFE and Rohtak Centre in particular have been appreciated by the Chief Ministers of these States for creating livelihood opportunities. An mJhinga mobile app developed by CIFE scientists provides digital support to these ventures. a salinity tolerant strain of common carp. The other initiatives of the institute, which she acknowledged, were related to the genetic improvement of the Indian catfish magur and common carp; fish breeding technologies, vaccines for aquatic animal pathogens, seafood safety and quality testing, non-conventional feeds and nutraceuticals; monitoring and remediation of coastal pollution; waste utilization; and development of value-added fish products. She also appreciated that the ICAR-CIFE alumni have achieved great heights both in India and abroad as scientists, entrepreneurs, and policymakers. She stressed that the world needs more food by 2050. Therefore, fisheries research and education will be critical. She also underlined the need for innovative research and extension programs to increase the production and consumption of aquatic food by expanding fish farming, increasing productivity, improving marketing, and reducing post-harvest losses. She congratulated the students who excelled and won medals, and urged CIFE to maintain and augment its stature in the field of higher education.

Dr. Hiralal Chaudhuri Award (Gold Medal) - XVII Convocation

Subject / Discipline-wise Topper (2021-2023 batch)

S.No.	Discipline	Name of the student	Batch	Regn.No.	OGPA
1.	AQC	Mr. Kamil Akamad D	2021-2023	AQC-MB1-06	8.82
2.	FRM	Mr. Vishal M.	2021-2023	FRM-MB1-04	8.86
3.	PHT	Ms. Prerana	2021-2023	PHT-MB1-07	8.78
4.	FGB	Ms.Yuvasree K	2021-2023	FGB-MB1-07	8.30
5.	FBT	Ms. Shinde Siba Anand	2021-2023	FBT-MB1-07	8.23
6.	FNFT	Mr.Kaleeswaran. V	2021-2023	FNFT-MB1-03	8.89
7.	FPB	Ms. Kajal Kumari	2021-2023	FPB-MB1-05	8.80
8.	AEM	Ms. Puja Rani Basak	2021-2023	AEM-MB1-05	8.90
9.	AAHM	Ms. Semeena M	2021-2023	AAH-MB1-04	8.82
10.	FEC	Ms. Gobika K	2021-2023	FEC-MB1-02	8.93
11.	FEX	Mr. Rujan J	2021-2023	FEX-MB1-07	8.82

Shri B.N. Sharma Award (Gold Medal)

Topper of Fisheries Extension Discipline (2021-2023 batch)

S.No.	Discipline	Name of the student	Batch	Regn.No.	OGPA
12.	FEX	Mr. Rujan J	2021-2023	FEX-MB1-07	8.82

Shri M.A. Upare Award (Gold Medal)

Topper of Fisheries Economics Discipline (2021-2023 batch)

S.No.	Discipline	Name of the student	Batch	Regn.No.	OGPA
13.	FEC	Ms. Gobika K	2021-2023	FEC-MB1-02	8.93

Prof. Ravindranath Krothapalli Award (Gold Medal)

Topper of AEHM Division (2021-2023 batch)

S.No.	Discipline	Name of the student	Batch	Regn.No.	OGPA
14.	AEM	Ms. Puja Rani Basak	2021-2023	AEM-MB1-05	8.90

Madhavprasad S. Jahagirdar Award (Gold Medal)

Topper of Fish Genetics & Breeding Discipline (2021-2023 batch)

S.No.	Discipline	Name of the student	Batch	Regn.No.	OGPA
15.	FGB	Ms.Yuvasree K	2021-2023	FGB-MB1-07	8.30

Dr. C.V. Kulkarni Award (Gold Medal)

Overall topper of 2021-23 batch

S.No.	Discipline	Name of the student	Batch	Regn.No.	OGPA
16.	FEC	Ms. Gobika K	2021-2023	FEC-MB1-02	8.93

Dr. S.C. Pathak Award (Gold Medal)

Overall topper most meritorious post graduate of 2021-23 batch

S.No.	Discipline	Name of the student	Batch	Regn.No.	OGPA
17.	FEX	Mr. Rujan J	2021-2023	FEX-MB1-07	8.82

2.6. National Science Day 2024

To encourage and inspire the students for translation of their AI related (Artificial Intelligence) innovations into a viable technology or product, Institute Technology Management Unit (ITMU) of ICAR CIFE organized an exhibition of the models and posters of the innovative ideas of the students on the occasion of National Science Day on 28 February, 2024 at the CIFE, New Campus Auditorium. The focal theme of the exhibition revolved around "Artificial Intelligence (AI) in Fisheries and Prospects for the Future". More than 40 students participated in 15 groups and displayed their models and posters. Each model and poster was explained to the visitors by the group of students of the respective booth. The event received an overwhelming response with a significant turnout of over 180 students, scientists, and technical staff. The exhibition showcased 5 operational models alongside 10 posters and banners, providing a comprehensive display of innovative ideas. Dr. S.P. Shukla, the Officer in Charge (ITMU) and Dr. Manjusha, Dr. Kapil Sukhdhane, Dr. Neha Qureshi, and Dr. Arun Kumar Sharma (Members, ITMU), coordinated the event. Dr. Gauri Harulkar, Research Associate (ITMU), coordinated with the students for a smooth conduct of the program. Dr. N.P. Sahu, The Joint Director of ICAR – CIFE, visited every stall and interacted with the student participants to know about their innovations and gave his valuable advice and suggestions. The faculty while visiting the stall gave valuable inputs to the students for further refinement of their technology, product or the concept/idea. The Director Dr. C.N. Ravishankar and Joint Director, Dr. N.P. Sahu commended the efforts of ITMU and its committee members for organizing the event that will encourage the students for entrepreneurial skills and conversion of their ideas into business models. All the models/posters were evaluated by a panel of judges and prizes were distributed.

2.7. Student Placement

Students Placement

Name of student	Discipline	Placed as (post held)	Organisation/ARS/state govt/ central govt/bank/ entrepreneur etc. and place of posting
Dr. Anisha V	AAH	Agricultural Research Service	Indian Council of Agricultural Research
Dr. Pratapa MG	AAH	Agricultural Research Service	Indian Council of Agricultural Research
Dr. Sajina K A	FNT	Agricultural Research Service	Indian Council of Agricultural Research
Dr. Amrutha Gopan	FNT	Agricultural Research Service	Indian Council of Agricultural Research
Dr. Ravindra Harish Sontakke	AQC	Agricultural Research Service	Indian Council of Agricultural Research
Dr. Sanitha Saseendran	AQC	Agricultural Research Service	Indian Council of Agricultural Research
Dr. Jess Maria Wilson	AQC	Agricultural Research Service	Indian Council of Agricultural Research
Dr. Srijit Chakravarthy	AQC	Agricultural Research Service	Indian Council of Agricultural Research
Dr. Lidiya Wilwet	FPT	Agricultural Research Service	Indian Council of Agricultural Research
Ms. Arya Singh	AAH	Assistant Professor	Fisheries College, Ayodhya
Dr. David Wiakhom	AAH	YPII	Indian Council of Agriculture Research
Dr. Ashraf Malik	FPB	Asst. professor (contract)	CoF, Gumla
Ms. Jenisha Justin	FNFT	Asst. professor (contract)	DIFST, Midalam, T.N
Dr. Hafeef Roshan K T	FPB	Asst. Professor (contract)	KAU, Kumarakom
Ms. Sruthy R Nair	FPB	Fisheries Inspector	Fisheries Department, Kerala
Ms. Arsha B	FPB	Fisheries Inspector	Fisheries Department, Kerala
Mr. Sagar Shinde	AQC	Subject Matter Specialist	CMFRI, Lakshadweep
Mr. Sourav Shadra	AQC	Subject Matter Specialist	CRIJAF, WB
Mr. B. Chanikya Naidu	FRM	STO	CIFT, Cochin
Mr. Shiva Rajak	FRM	Subject Matter Specialist	ICAR-NRC, Assam
Ms. Thanga Anushya	FRM	Subject Matter Specialist	ICAR-CSSRI, UP

Mr. Angom Baleshwar	AEM	Subject Matter Specialist	Ukhrul, Manipur
Ms. Aatira Farooq	AQC	Deputy inspector Fisheries	Assistant Director, Fisheries Office, District Budgam, Jammu & Kashmir
Ms. Venisza Cathy John	AQC	Fisheries Officer	Fisheries Department, Government of Kerala
Mr. Syam K. R.	AQC	Subject Matter Specialist	ICAR-KVK, North 24 Parganas (additional) (CRUAF)
Ms. Subam Debroy	AQC	Subject Matter Specialist	ICAR-KVK, Nimbudera, North & Middle Andaman (ClARl)
Ms. Gitanjali Behera	AQC	Aquaculture	ICAR-KVK, Nicobar (ClARl)
Ms. Puja Chakraborty	AQC	Subject Matter Specialist	ICAR-KVK, Meghalaya
Mr. Sourabh Bhadra	AQC	Subject Matter Specialist	ICAR-KVK, West Bengal
Mr. Pradeep A	FGB	Subject Matter Specialist	ICAR-KVK, Karnal
Ms. Chandani Dave	FEC	YP-II	ICAR-CIFE, Mumbai
Dr. Velumani T.	FEX	Project scientist	Bay of Bengal Project(IGO), Chennai
Dr. Akilandeshwari A.	FEX	Guest Faculty	Faculty of Fisheries Science, Kufos, Panangad
Dr. Suman Dey	FEX	Assistant Professor	College of Fisheries, Kumarganj
Ms. Naila Majid Bhat	FEX	Assistant Professor (Contract)	College of Fisheries at Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir (SKUAST-K)
Ms. Nidhi Kartre	FEX	YP-II	ATARI, Zone IX, Jabalpur
Dr. Zahoor Mushtaq	AAHM	FDO	Kashmir state fisheries
Dr. Naveen Rajeshwar	AAHM	Project manager	NITTE university, Mangalore
Dr. Arpit Acharya	AAHM	Guest Faculty	OUAT, Odisha
Mr. Suraj Saha	AAHM	YP-II	Indian Council of Agriculture Research
Mr Tausique Raza	AAHM	YP-II	Indian Council of Agriculture Research
Mr. Gulapi Bada	AAHM	FDO	Department of Fisheries, Govt. of Odisha
Ms. Kritika Behera	AAHM	FDO	Department of Fisheries, Govt. of Odisha

2.8. Awards received by Students

CV Kulkarni Best PhD Research Student
Dr. Anisha V was awarded with the CV Kulkarni Best PhD Research Student award by ICAR-CIFE on June 6, 2024.

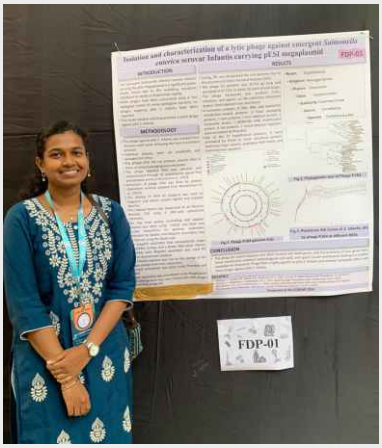
Dr. C.V. Kulkarni Gold Medal, MFSc Student Research for the Year 2023
Ms. Aatira Farooq was awarded the Dr. C.V. Kulkarni Gold Medal for her research in MFSc, presented by ICAR-CIFE, Mumbai on June 6, 2024.

Best Student Entrepreneurship Vision Award
Mr. Atul Kumar Singh received the Best Student Entrepreneurship Vision Award at the NAHEP Entrepreneurship Workshop, ICAR-CIFE, Mumbai, on August 2, 2024.

Dr. H.P.C Shetty Gold Medal for Best Innovation - 2024
Mr. Saurav Debnath was recognized with the Dr. H.P.C Shetty Gold Medal for Best Innovation at the College of Fisheries, Kishanganj, Bihar Animal Science University, Patna, during November 18-19, 2024.

Best Post Graduate Thesis Award
Mr. Saurav Debnath received the Best Post Graduate Thesis Award by the Executive Council of SBER at the 4th Biotic Science Congress, held at the College of Agriculture, Meghalaya, on November 21-22, 2024.

Best PhD. Thesis Award
Dr. Naila Majid Bhat has received the Best PhD Thesis Award at the International Conference on Agritech Intelligence and Beyond, organized by SKUAST-Kashmir, during October 15-17, 2024.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IIFET 2024
PENANG
AQUATIC FOOD SYSTEMS IN THE BLUE ECONOMY
Welcome to the 21st IIFET Conference
15-19 July 2024
Penang, Malaysia


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International Conference on
Fisheries and Aquaculture


IIFET 2024
PENANG
IIFET Pre-Conference Workshop
Integrating Gender into Fisheries and Aquaculture Economics and Trade Research
15 July 2024
WorldFish Penang, Malaysia


IIFET 2024
PENANG
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2.9. Awards received for papers/posters presented by students in conferences and seminars

International Conference on Microbiological Research: Current Challenges and Future Perspectives (ICMR-CCFP)

Venue: Bharathidasan University, Tiruchirappali
Date: 9-11 January, 2024

Ms. Krishnaveni S.
Discipline: PhD (FPT)
Best Poster Award
Topic: Development of a molecular method to study the distribution of emerging antibiotic resistance plasmid in seafood-borne Salmonella

International Fisheries Congress and Expo-2024, Kochi, India

Date: 12-14 January, 2024

Mr. Rujan J.
Discipline: FEX, MFSc
Award: Best Oral Presentation
Topic: Assessing governance in primary marine fisheries cooperative societies in Kanyakumari district, Tamil Nadu

13th Indian Fisheries and Aquaculture Forum (IFAF), ICAR-CIFRI, Kolkata

Date: 23-25 February, 2024

Mr. Bhuvaneswaran T.
Discipline: FNT, PhD
Award: Best Oral Presentation
Topic: To evaluate the effect of defatted black soldier fly larvae (BSFL) meal in the diet of *Penaeus vannamei* (Boone, 1931) juveniles reared in brackish water

Mr. Soumyodeep Bhattacharya
Discipline: FNT, MFSc
Award: Best Poster Presentation
Topic: Evaluation of pineapple peel ethanolic extract in the diet of *Labeo rohita* (Ham.1822) fingerlings reared under different stocking densities

Ms. Amirtha Kayalvizhi
Discipline: FNT, PhD
Award: Best Poster Presentation
Topic: Jojoba (*Simmondsia chinensis*) protein concentrate for the feasibility of sustainable aquaculture

Mr. Sanju Nehra
Discipline: FPT, MFSc
Award: Best Poster Award
Topic: Detection of *Cronobacter sakazakii* in seafood by colony hybridization using a biotin-labeled probe

Ms. Amritha Kayalvizhi
Discipline: FNFT, PhD
Award: Best Poster Presentation
Topic: Advances in fish Nutrition research

Ms. Gitashree Thengal
Discipline: FEX, M.F.Sc.
Award: Best Poster Presentation
Topic: Social Science research in fisheries and Aquaculture

Mr. Abhilash Thapa
Discipline: FEC, PhD
Award: Best Poster Presentation
Topic: Social Science research in fisheries and Aquaculture

Japan International Fisheries Research Society at IIFET 2024, Penang Conference, Malaysia

Date: July 15, 2024

Dr. Naila Majid Bhat
Discipline: FEX, PhD
Award: JIFRS Yamamoto Prize Best Paper
Topic: Measuring Fisheries Development at Grassroots: Evidence from Haryana and Punjab

Gevanam Genomics Summit, Lucknow

Date: 20-21 July, 2024

Mr. Samad Sheikh
Discipline: AAHM, PhD
Award: Third Prize Paper Presentation
Topic: CD markers and their role in Immune responses

ICAR-CIFE & Avanti LTD, India, Brainstorming session on Empowering Student Entrepreneurs: Innovating Aquafeed for Sustainable Aquaculture

Date: 29 July, 2024

Ms. Anvita Sreemathi S.
Discipline: FNFT
Award: Best Presentation Award
Topic: Valorizing Biofloc Sludge as a source for producing Short Chain Fatty Acids (SCFAs)

11th International Conference on Fisheries and Aquaculture (ICFA 2024), Bangkok, Thailand

Date: 26-27 September, 2024

Mr. Radhakrishnan
Discipline: FEC, PhD
Award: Best Oral Presentation
Topic: Economic Analysis of Different Stocking Densities of White-leg Shrimp Production in Tamil Nadu, India

5th International Conference on Bacteriophage Research and Antimicrobial Resistance, Andheri, Mumbai

Date: 8-9 November, 2024

Ms. Jerusha S.
Discipline: PHT, PhD
Award: Best Poster Award
Topic: Isolation and characterization of a lytic phage against emergent Salmonella enterica serovar Infantis carrying pESI megaplasmid

Ms. Fathima Salam
Discipline: DBT SRF
Award: Consolation Prize for Best Poster
Topic: Development of a real-time PCR method for specific detection of multi-drug resistant Arcobacter butzleri from seafood using novel primers

International Conference Virocon 2025, Award conferred by Indian Virological Society

Date: November 13, 2024

Ms. Supradnya Meshram
Discipline: AAHM, PhD
Award: Second Prize, Poster Presentation
Topic: Development of monoclonal antibodies for the detection and identification of Tilapia lake virus

International Conference on "Environmental Conservation and Sustainability" at C. Abdul Hakim College, Melvisharam, Tamil Nadu

Date: December 18-20, 2024

Ms. Harshavarthini M.
Discipline: FGB, PhD
Award: Best Oral Presentation
Topic: Environmental Conservation and Sustainability

National Seminar on "Advances in Environment Management for Sustainable Fisheries and Livestock Production" (AEMS-2024)

Venue: College of Fisheries (BASU), Kishanganj, Bihar
Date: 18-19 November, 2024

Ms. Rishika MS
Discipline: AEM, MFSc
Award: Women Scientist Oration Award
Presentation: Master's Research Presentation

Ms. Mayuri Nag
Discipline: AEM, MFSc
Award: Dr. HPC Shetty Gold Medal for Best Innovation – 2024 (Secured 2nd Position - PG)

Ms. Mayuri Nag
Discipline: AEM, MFSc
Award: First Prize for Model Making
Topic: Model Making on "Artificial Intelligence (AI) in Fisheries and Prospects for the Future"

Ms. Mayuri Nag
Discipline: AEM, MFSc
Award: Best Presentation Award
Topic: "Entrepreneurial Opportunity in Aquatic Animal Health Management"

Mr. Bhautik Savaliya
Discipline: AEM, PhD
Award: Dr. HPC Shetty Gold Medal for Best Innovation – 2024 (Secured 1st Position - PhD)

Mr. Bhautik Savaliya
Discipline: AEM,PhD
Award: Dr. K.V. Devaraj Memorial Best Post Graduate Researcher Award 2024

Mr. Ganeshkumar
Discipline: AEM/2022-27 (PhD) & Assistant Prof. (RLBCAU)
Award: Dr. V. R. P. Sinha Best Master's Thesis Award

Chapter 3
Research Achievements

List of institutional projects

Role of exogenous hormonal manipulation in environmental- endocrine relation in breeding performance and mating behaviour of *Clarias magur*
2022 – 2025
Principal Investigator: Thongam Ibemcha Chanu
Co-Principal Investigators: S. Jahageerdar, Arun Sharma, Dalongsaih Reang, Kapil Sukhdhane, Babitha Rani
Technical Associates: Narendra K. Aglave, Hasan Javed

Amelioration of Inland saline water for aquaculture use in Maharashtra
2023 - 2026
Principal Investigator: Kapil S Sukhdhane
Co-Principal Investigators: Debajit Sarma, Munilkumar Sukham, Thongam Ibemcha Chanu, Madhuri Pathak, Ananthan P. S.
Technical Associates: Narendra Aaglave

Propagation and utilization of red seaweed, *Gracillaria* spp. for sustainable shrimp aquaculture
2023-2025
Principal Investigator: Madhuri Pathak
Co-Principal Investigators: Munilkumar Sukham, Vaibhav A. Mantri (CSIR-CSMCRI), Jeena K, Thongam Ibemcha Chanu, Kapil Sukhdhane

Techno-economic feasibility and value addition prospects of biofloc technology in inland saline aquaculture
Principal Investigator: Babitha Rani A M.
Co-Principal Investigators: Thongam Ibemcha Chanu, Shamna N, Pankaj Kumar, Sreedharan K, Upasana Sahoo

Performance evaluation of *Channa striata* during fry rearing phase using bioaugmentation technique in zero/minimal, water exchange system.
2024-2025
Principal Investigator: Upasana Sahoo
Co-Principal Investigators: Debajit Sarma, Binaya Bhusan Nayak, Kedar Nath Mohanto, Babitha Rani, Saloni Shivam
Technical Associates: Satya Prakash

A novel approach to fish biowaste utilization by marine bacteria-mediated production of industrially valuable collagenases
2024-27
Principal Investigator: Sanath Kumar H
Co-Principal Investigators: Manjusha L, Nayak B.B

Development of molecular methods for detection and quantification of *Cronobacter* spp. of human health significance in seafood
2022-25
Principal Investigator: Manjusha L.
Co-Principal Investigators: B. B. Nayak, Sanath Kumar H.

Bioprospecting of thermotolerant freshwater microalgae in climate change scenario
2022-2025
Principal Investigator: S.P. Shukla
Co-Principal Investigator: Kundan Kumar, Saurav Kumar, Tincy Verghese

Taxonomical, biochemical evaluation and utilisation of Order Dictyotales (Phaeophyceae) – brown algal species
2021-2024
Principal Investigator: Layana P
Co-Principal Investigators: Annam Pavan Kumar

Development of Reference DNA mini-barcodes and Associated High-Resolution Melting (HRM) profiles for Authentication of Fish species in Processed Products
2022-2025
Principal Investigator: A. Pavan Kumar
Co-Principal Investigators: Aparna Chaudhari, Manjusha, A.K. Jaiswar, Gireesh-Babu, P., Pankaj Kishore

Modification of Dolnet for sustainable fisheries management along Mumbai Coast
2022-2025
Principal Investigator: Karankumar K. Ramteke
Co-Principal Investigators: Asha T. Landge, Abuthagir Iburahim, Shobha Rawat, Dayal Devadas

Ecological assessment and Multi-metric Index development for selected riverine ecosystems in Maharashtra, India
2024-2025
Principal Investigator: Sukham Monalisha Devi
Co-Principal Investigators: Asha T. Langde, Sangeeta Mandal, Karankumar K. Ramteke, Shobha Rawat, Dayal Devadas, Abuthagir Iburahim S., Shivaji Dadabhau Argade

India's Patented Technological Innovations in Fisheries and Aquaculture
2022-2025
Principal Investigator: Arpita Sharma
Co-Principal Investigators: Vinod K Yadav

Evaluation of RNA-guided recombinase (RGR) platform for cell- independent and safer genome engineering in zebrafish vertebrate mode
2022-2025
Principal Investigator: Arvind A. Sonwane
Co-PI: Aparna Chaudhari, Manoj P. Brahmane, Mujahidkhan A. Pathan, Kiran D. Rasal

Toxicogenomic responses of microplastics in intertidal bivalve *Gafrarium divaricatum* (Gmelin, 1791)
2024-2026
Principal Investigator: N. S. Nagpure
Co-Principal Investigators: Mukunda Goswami, Rupam Sharma, Manoj P. Brahmane, Kiran D. Rasal

Utilization of Jojoba (*Simmondsia chinensis*) and mahua (*Madhuca indica*) cake/ meals-based products in aquafeed
Principal Investigator: Manish Jayant
Co-Principal Investigators: Ashutosh D Deo, Shamna N, Subodh Gupta, Kiran Rasal

Enhancing the physiological and metabolic adaptive mechanisms of Tilapia to hyper-thermal stress through dietary interventions and environmental manipulation
2022-2025
Principal Investigator: Tincy Varghese
Co-investigators: S. Gupta, Sikendra Kumar, Md. Aklakur. Saurav Kumar

Reproductive endocrinology and captive breeding of one-stripe spiny eel, *Macrognathus aral*.
2023-2026
Principal Investigator: Prem Kumar
Co-Principal Investigators: Sukham Munilkumar, Rupam Sharma

Evaluation of feeds for improved growth and survival of fishes during the winter season
2023-2026
Principal Investigator: Ashutosh D Deo
Co-investigators: Shamna N, Manish Jayant, Md. Aklakur, Subodh Gupta, Dhalongsaih Reang

Comparative evaluation of carbohydrate-based prebiotics in enhancing eubiosis in fish
2024-2027
Principal Investigator: Subodh Gupta
Co-investigators: Aparna Chaudhari, Tincy Varghese, Parimal Sardar

Application of Heterologous Prime and Boost Strategies for Augmentation of Immunoprophylaxis in Nile Tilapia, Oreochromis niloticus
Principal Investigator: Jeena K.
Co-Principal Investigators: Megha K. Bedekar, Gayatri Tripathi, Madhuri Pathak

Risk assessment of E-waste leachates to aquatic microalgae and fish under climate change scenario and developing potential remediation approach
2024-2025
Principal Investigator: Saurav Kumar
Co-Principal Investigators: S.P. Shukla, Kundan Kumar, Vidya Shree Bharti, Megha K. Bedekar

Development of Nano-Fertilizer enriched biochar and its effect on water productivity, fish growth and GHGs emission in aquaculture
2023-2026
Principal Investigator: Dr. Vidya Shree Bharti
Co-Principal Investigators: Rupam Sharma, A.K. Verma, Saurav Kumar, Suman Manna

A study on the white faeces syndrome (WFS) in farmed Penaeus vannamei in inland saline areas and development of a management strategy
2022-2025
Principal Investigator: Sreedharan K
Co-PI: Babitha Rani A.M, Pankaj Kumar, H. Sanath Kumar, Gayatri Tripathi
Technical associates: Ashok Kumar, Satyendar Singh

Screening and evaluation of species specific Feeding stimulants and attractants for aquaculture
2022-2025
Principal Investigator: MD Aklakur
Co-Principal Investigators: Ashutosh D Deo, D.K. Singh, T. Varghese, Manish Jayant, Udipta Roy

Strategies for quality fish production through species combination, environmental and nutritional interventions
2022-2025
Principal Investigator: G. Biswas
Co-Principal Investigators: G.H. Pailan, P. Sardar, S. Sahoo, H. Mandakini Devi, D.K. Singh, Suman Manna, MS. Pradhan, Leesa Priyadarsani
Technical Associate: P.K. Behera

Evaluation of non-invasive detection methods for assessing stress response in fish (Fish Welfare part-2)
2023-2026
Principal Investigator: Sujata Sahoo
Co-Principal Investigators: Leesa Priyadarsani, Suman Manna, D.K. Singh, G. Biswas, G. H. Pailan

Performance effectiveness and impact assessment of selected ICAR-CIFE's technologies in Eastern and North-Eastern regions of India
2024-2027
Principal Investigator: G. H. Pailan
Co-Principal Investigators: T.K. Ghoshal, D. K. Singh, H. Mandakini Devi, S. Manna, S. Pradhan, L. Priyadarshani, Dr. Shivaji Argade
Technical Associates: P.K. Behera, P. Das

Nutritional intervention for productivity enhancement of Asian stinging catfish (*Heteropneustes fossilis*) reared in intensified condition
2024-2027
Principal Investigator: T.K. Ghoshal
Co-Principal Investigators: P. Sardar, G. Biswas, S. Sahoo, D.K. Singh, S. Pradhan, Leesa Priyadarsani

Valorization of Fruit and Vegetable Waste for Aquafeed
2022-2025
Principal Investigator: Shamna N
Co-Principal Investigators: Parimal Sardar, Manish Jayant, Subodh Gupta, Dr. Manjusha L., Babitha Rani, Jeena K., Namrata A. Giri

Optimization of stocking density and feeding strategies in brackishwater polyculture models for enhanced production
2024-2027
Principal Investigator: Muralidhar P. Ande
Co-Principal Investigators: Karthireddy Syamala, Shamna N. Gouranga Biswas
Technical Associates: M. Usha Rani

Evaluation of suitable common carp (*Cyprinus carpio*) with suitable plants for sub-tropical climatic conditions in Aquaponic system
Principal Investigator: Harsha Haridas
Co-Principal Investigators: A.K. Verma, S.K. Nayak, Dhalongsaih Reang, Debajit Sarma, Shashi Bhushan
Technical Associates: Hasan Javed

List of externally funded projects

Technology demonstration of emerging fish species in biofloc culture system
Principal Investigator: Babitha Rani A. M.
Co-Principal Investigators: Shamna, N., Sreedharan, K., Upasana Sahoo
Funding agency: NFDB

Environmental and nutritional intervention to farm white leg shrimp, *Penaeus vannamei* in low saline water (LSW): a strategy for improving aquaculture production
Principal Investigator: Sukham Munilkumar
Co-Principal Investigators: Prem Kumar, T. I. Chanu
Funding agency: ICAR-NASF

Sensor Based Vertical Farming in Horticultural Crops and Aquaponic System Development for Fisheries
Principal Investigator: A.K. Verma
Co-Principal Investigators: Prem Kumar, Tincy Varghese
Funding agency: ICAR-NASF

All India Network project on Ornamental Fish Breeding and Culture: Technology development on captive breeding and seed production of selected indigenous ornamental fishes native to North Eastern Hill region and Western Ghats
Principal Investigator: Paramita Banerjee Sawant
Co-Principal Investigators: Debajit Sarma, Gouranga Biswas, Udipta Roy
Funding agency: ICAR

Investigations on ecological status, conservation, and enhancement of fisheries in Maharashtra part of Sardar Sarovar Reservoir
Principal Investigators : Sukham Munilkumar, Arpita Sharma, A.K. Jaiswar
Co-Principal Investigators: Kapil Sukhdhane, Karan Kumar Ramteke
Funding agency: Department of Fisheries, Government of Maharashtra

To study the effect of application of AQUALAABH on growth and production performance of *Peneaus vannamei* and fin fishes in Inland Saline waters
Principal Investigator: Debajit Sarma
Co-Principal Investigators: Kapil Sukhdhane
Funding agency: Agrocel Industries Pvt. Ltd., Gujarat

Technology demonstration of premium quality Masmin production in Lakshadweep for domestic and export market
Principal Investigator: B.B. Nayak
Co-Principal Investigators: Deepitha R.P.
Funding agency: NFDB

Distribution of pathogenic microaerophilic *Arcobacter* sp. in seafood and development of a rapid method for its detection
Principal Investigator: B.B.Nayak
Co-Principal Investigators: Manjusha L, Sanath Kumar H
Funding agency: Department of Biotechnology (DBT), Govt. of India

All India Network Project on AMR in fisheries and livestock
Principal Investigator : Sanath Kumar H
Co-Principal Investigators: Manjusha L, Jeena K, Saloni S
Funding agency: Indian Council of Agricultural Research

In Vitro Differentiation and Characterization of Fish Muscle and Optimization on Plant-Based Scaffolding Towards Whole Cut Seafood Production
Principal Investigator: Mukunda Goswami
Funding agency: Good Food Institute, USA

Characterization of Adaptive and Resilient Molecular Responses to Thermal Stress in *Labeo rohita* Through Multi-Omics Approach
Principal Investigator: N. S. Nagpure
Co-Principal Investigators: Mukunda Goswami, Manoj P. Brahmane, Kiran D. Rasal, Sunil Kumar, Sudhir Srivastava
Funding agency: Network Project on Agricultural Bioinformatics and Computational Biology of ICAR-IASRI

ICAR - Network Program on Precision Agriculture (NePPA)
Principal Investigator: Ashutosh D. Deo
Co-Principal Investigators: B.B. Nayak, A.K. Verma, Vinod Kumar Yadav, Vidya Shree Bharti, KaranKumar K. Ramteke, Layana P., Manish Jayant, Arun Sharma
Funding agency: ICAR

Study on the occurrence, impact on biotic communities and development of integrated technologies for remediation of the emerging pollutant Triclosan

Principal Investigator: Kundan Kumar
Co-Principal Investigators: S.P. Shukla, Saurav Kumar
Funding agency: DST, New Delhi

Referral Laboratory under the National Surveillance Programme for Aquatic Animal Diseases
Principal Investigator: Megha Kadam Bedekar
Co-Principal Investigators: Jeena K
Funding agency: MFAH&D, Govt. of India

Application of CRISPR/Cas system in molecular detection of fish and shrimp diseases
Principal Investigator: Megha Kadam Bedekar
Co-Principal Investigators: Rajendran KV, Jeena K, Kundan Kumar, Kiran Rasal
Funding agency: ICAR Consortia research platform for vaccine and diagnostics

All India Network Project on Fish Health
Principal Investigator: Megha Bedekar
Co-Principal Investigators: Swadesh P. Tiwari, Arun Sharna, Saurav Kumar
Funding agency: ICAR

Toxicological studies of consortia of pure culture microbial formulation applied in waste treatment in component of freshwater ecosystem like algal, cyanobacteria, daphnia and fish model
Principal Investigator: S.P. Shukla
Co-Principal Investigators: Munilkumar Sukham, Kundan Kumar, Saurav Kumar
Funding agency: Bioxgreen Private Limited, Chennai

A study on the algal biomass based aqua feed on fish growth and immunological properties
Principal Investigator: S.P. Shukla
Co-Principal Investigators: Kundan Kumar, Saurav Kumar, Manish Jayant
Funding agency: Reliance Industries Ltd

Evaluation of efficacy and safety of functional feed in *Litopenaeus vannamei* under experimental challenge condition
Principal Investigator: Megha K. Bedekar
Co-Principal Investigators: Saurav Kumar
Funding agency: TeOra Lifesciences Pvt Ltd.

Efficacy study of *Aeromonas veronii* vaccine
Principal Investigator: Megha Bedekar
Co-Principal Investigator: Gayatri Tripathi
Funding agency: Indian Immunologicals Pvt Limited

Toxicity evaluation of bio culture product personamedy *717 in freshwater ecosystem like algal and fish model
Principal Investigator: Kundan Kumar,
Co-Principal Investigators: S.P. Shukla, Saurav Kumar
Funding agency: J. M. Infra and Enviro technologies PVT. Ltd.

Identification and comparative expression analysis of novel immune-related genes against prevalent bacterial infections and development of remedial measures in Asian Seabass, *Lates calcarifer*
Principal Investigator: Gayatri Tripathi
Co-Principal Investigators: Amiya Kumar Sahoo, Dharmendra Kumar Meena, Jeena K, Kiran Rasal, Manish Jayant, R. Bharathi Rathinam
Funding agency: DBT

National Surveillance Project on Aquatic Animal Diseases (Phase - II)
Principal Investigator: Gayatri Tripathi
Co-Principal Investigators: Jeena K, Sreedharan K
Funding agency: PMMSY

Genetic Improvement of Common Carp Cyprinus carpio for Inland Saline Aquaculture: Strain development for underutilized water resources (Phase I)
Principal Investigator: Mujahidkhan A. Pathan, Aparna Chaudhari, Angom Lenin Singh, Babita Rani, Pankaj Kumar, Shreedharan K. Mohd. Aklakur, Sunil Kumar Nayak, Dhalong Se Reang
Project Associate: Ashok Kumar, Satyender Kumar Singh, Reshma Raje
Funding agency: Department of Fisheries, MFDAH, Government of India

Establishment of a Bio-resource Facility of Zebrafish (*Danio rerio*): A National Genetic Repository for Wild Type and Inbred Zebrafish- Phase I
Principal Investigator: Mujahidkhan A. Pathan
Co-Principal Investigators: Aparna Chaudhari, Angom Lenin Singh, Jeena K.
Funding agency: NFDB

Technology Demonstration of Singhi catfish culture in Recirculatory aquaculture system (RAS) and entrepreneurship development in the region.
Principal Investigator: MD Aklakur
Co-Principal Investigator: Ashutosh D Deo
Funding agency: NFDB

Captive breeding of Hilsa, *Tenualosa ilisha*: Phase II
CC Principal Investigator: Subrata Dasgupta (Till January, 2023), G. Biswas (February, 2023 onwards)
Co-Principal Investigators: Gayatri Tripathi, Mujahidkhan A. Pathan (Till June, 2023), Kiran Rasal (June, 2023 onwards), T.K. Ghoshal (August, 2023 onwards)
Funding agency: ICAR – NASF

Utilization of open race-way cultured micro-algae *Chlorella vulgaris* (CV) in the diet of Clarias magur fingerlings
Principal Investigator: Shamna N,
Co-Principal Investigators: Yogendra Shastri, Parimal Sardar
Funding agency: RGSTC, Govt of Maharashtra

Evaluation of StringBio products in fish and shellfish feed
Principal Investigator: Shamna N,
Co-Principal Investigators: Karthireddy Syamala,
Muralidhar P. Ande
Funding agency: String Bio Pvt Ltd, Bengaluru

Effect of feeding ricebran supplemented with exogenous enzyme on digestion, nutrient utilization and growth of carps
Principal Investigator: Shamna N.
Co-Principal Investigators: Muralidhar P. Ande, Shobha Rawa
Funding agency: Sri Venkatarama Gia Pvt LTD, Andhra Pradesh

Whole Genome Sequencing of *Labeo fimbriatus*
Principal Investigator: Aparna Chaudhari
Co-Principal Investigators: A. Pavan Kumar; Kiran D. Rasal
Funding agency: CRP Genomics Platform, ICAR

Elucidation of molecular mechanism of captive reproduction of *Clarias dussumieri* and derive relevant cues for successful induced spawning of male *Clarias magur*
Principal Investigator: Rupam Sharma
Co-Principal Investigators: Mujahidkhan Pathan, Kiran D. Rasal, Jitendra Kumar Sundaray
Funding agency: NASF

Swachhta Action Plan (SAP) Management and Commercial Utilization of Fish Waste in Fish Market
Principal Investigator: Arpita Sharma
Co-Principal Investigators: Swadesh Prakash, Ajit Verma, VidyaShree Bharti, Prem Kumar
Funding agency: ICAR New Delhi

Agri-Drone Technology Demonstration Project
Principal Investigator: Ananthan P.S
Co-Principal Investigators: A. K. Verma, Shivaji Argade, Abuthagir Iburahim, Gourang Biswas, Muralidhar Ande, Sunil Kumar Nayak, Md. Aklakur, Pankaj Kumar
Funding agency: Ministry of Agriculture and Farmers' Welfare, New Delhi

Institutional Projects

3.1. Aquaculture Division

3.1.1 Amelioration of Inland saline water for aquaculture use in Maharashtra

Project duration: 2023-26

Principal Investigator
Kapil S Sukhdhane

Co-Principal Investigators
Debajit Sarma, Munilkumar Sukham, Thongam Ibemcha Chanu, Madhuri Pathak, Ananthan P. S.

Technical Associate:
Narendra Aaglave

The study was conducted to evaluate the effect of ionic manipulation on the culture of Penaeus vannamei from inland saline waters of Western Maharashtra. The experiment included two control groups-one using diluted seawater and the other using raw saline water-and four treatments, each consisting of different combinations of essential minerals. These treatments focused on varying ratios of calcium (Ca^{2+}), magnesium (Mg^{2+}), and potassium (K^{+}) to assess their impact on water quality, shrimp growth, and physiological parameters. Water quality parameters, such as temperature, pH, dissolved oxygen, total ammonia nitrogen (TAN), NO_2-N, and NO_3-N, did not show significant variation. However, salinity, total alkalinity, total hardness, and the concentrations of Ca^{2+}, Mg^{2+}, and K^{+} ions varied significantly ($p<0.05$) across different treatments. Growth performance metrics, including survival rate, weight gain, specific growth rate, and feed conversion efficiency, were notably influenced by the presence of supplemental ions. Among the treatments, those enriched with K^{+} + Ca^{2+} and the combination of Ca^{2+} + Mg^{2+} + K^{+} resulted in the best growth outcomes. Physiological assessments indicated significant differences in enzyme activity, serum glucose levels, and osmolality between treatments, emphasizing the role of ionic composition in regulating stress. The study suggests that optimizing the ionic balance in inland saline waters of Maharashtra can enhance shrimp culture, providing a viable alternative for regions where high salinity limits agricultural productivity.

3.1.2 Propagation and utilization of red seaweed, *Gracillaria* spp. for sustainable shrimp aquaculture

Project duration: 2023-25

Principal Investigator
Madhuri Pathak

Co-Principal Investigators
Munilkumar Sukham, Vaibhav A. Mantri (CSIR-CSMCRI), Jeena K, Thongam Ibemcha Chanu, Kapil Sukhdhane

An optimization study of *Gracilaria foliifera* in shrimp wastewater over 96 hours identified the optimal stocking density of 1–3.5 g L^{-1}, based on nutrient uptake efficiency. In the co-culture experiment, the highest uptake was achieved when *G. foliifera* was stocked at 3.5 g L^{-1}, with different stocking densities of *Penaeus vannamei* (20, 40, 60, 80, 100 individuals m^{-2}) assessed, along with two controls: shrimp monoculture and *Gracilaria* monoculture. The results showed that co-culturing *P. vannamei* at 60 individuals m^{-2} with *G. foliifera* at 3.5 g L^{-1} resulted in the highest mean weight gain, specific growth rate, and improved water quality and physiological responses. Two seaweed cultivation methods-tubenet and monoline-were evaluated in ponds to develop a field-based co-culture model for *Gracilaria* spp. and *Penaeus vannamei*. The tubenet method failed as the seaweeds could not survive in the shrimp ponds due to the limited space in the tubenet pockets. The monoline culture method was adapted for shrimp ponds at three different days of culture (DOC): T1 (30th DOC), T2 (45th DOC), and T3 (60th DOC). Increased biomass of the seaweed in the co-culture system indicated that nutrients from shrimp effluent, particularly nitrogenous waste, benefitted seaweed growth and enhanced overall productivity. Overall, the results suggest that introducing seaweed at 45 days (T2) optimizes nutrient uptake, improves growth, and reduces stress, making it the most effective co-culture system for bioremediation.

Co-culture of seaweed and shrimp

3.1.3 Role of exogenous hormonal manipulation in environmental - endocrine relation in breeding performance and mating behaviour of *Clarias magur*

Project duration: 2022-2026

Principal Investigator
Thongam Ibemcha Chanu

Co-Principal Investigator
S. Jahageerdar, Arun Sharma, Dalongsaih Reang, Kapil Sukhdhane, Babitha Rani

Technical Associates:
Narendra K. Aglave, Hasan Javed

The effects of the combined exogenous peptide and steroid hormones were compared with their individual applications to assess their synergistic potential in enhancing reproductive outcomes. The male Magur fish, when treated with both hormones, exhibited improved sperm quality, as indicated by a higher sperm density and greater volume, along with a higher spermatocrit value. These findings suggest that the combination of both hormones has a more pronounced effect on reproductive success than their individual use. Furthermore, the observations of mating behavior indicated that steroid hormone induction triggered the onset of mating behavior in Magur and led to its sustained expression over a 48-hour period. The hormonal induction appeared to synchronize the mating activities within the population, making it a valuable tool for controlling and enhancing breeding in captive conditions. In conclusion, the results from all three experiments highlight the significant role of both peptide and steroid hormones in improving spermiation, sperm quality, and mating behavior in Magur. These findings contribute to a deeper understanding of hormone-mediated reproductive processes, which can be applied to enhance fish breeding programs in aquaculture.

3.1.4 Techno-economic feasibility and value addition prospects of biofloc technology in inland saline aquaculture

Project duration: 2022-24

Principal Investigator
Babitha Rani A M.

Co-Principal Investigators
Thongam Ibemcha Chanu, Shamna N, Pankaj Kumar, Sreedharan K, Upasana Sahoo

The semi-biofloc technology was tested in a total of six polylined ponds, each with an area of 200 m², using Pacific white shrimp with an average weight of 2.2 g. The ponds were treated with biofloc at a stocking density of 60 individuals per cubic meter and a control group with 40 individuals per cubic meter, in triplicates. The experimental trial was conducted over a period of 120 days. The ponds were inoculated with indigenously prepared biofloc consortia in a bioreactor, using soil enrichment at 15‰ salinity. The methodology for inoculation and maintenance of biofloc in open polylined ponds was standardized. Biofloc ponds were maintained as a zero-water discharge system, while the control ponds had limited water exchange. The biofloc consortium was fermented overnight using jaggery/molasses to maintain a carbon-to-nitrogen ratio of 10:1. Bio-growth parameters were significantly higher in the control ponds compared to the biofloc ponds. However, biomass yield and survival rates were significantly higher in the biofloc ponds. Other value-added parameters, such as the fatty acid profile and amino acid profile, showed enhanced values for various fatty acids and amino acids important for biofloc-reared shrimp. The nutritional composition of the shrimp was also significantly higher in the biofloc system compared to the control. Furthermore, the *Vibrio* load in the culture unit was significantly lower in the biofloc ponds compared to the control. A considerable reduction in the feed conversion ratio (FCR) was observed in the biofloc system (1.09) compared to the control (1.4), resulting in a better cost-to-benefit ratio for the biofloc system.

3.1.5 Performance evaluation of *Channa striata* during fry rearing phase using bioaugmentation technique in zero/minimal, water exchange system

Project duration: 2024-2025

Principal Investigator
Upasana Sahoo

Co-Principal Investigator
Debajit Sarma, Binaya Bhusan Nayak, Kedar Nath Mohanto, Babitha Rani, Saloni Shivam

Technical Associate:
Satya Prakash

In the 60-day experimental trial of the *Channa striata* rearing system with no water exchange, the best combination of exogenous microbes and enzymes for the formulation of the bioaugmentation agent was Treatment (T4), which included *Bacillus subtilis* (0.2 g/L), *Lactobacillus sporogenes* (0.1 g/L), Nitrobacter (0.1 g/L), and protease (0.25 g/L). This combination resulted in the highest weight gain percentage (360.20 ± 20.92%), with a final weight of 50.10 ± 0.90 g (compared to initial weight of 10 ± 1 g), the lowest feed conversion ratio (FCR) of 1.44 ± 0.05, and favorable water quality parameters: Total Ammonia-Nitrogen (0.60 ± 1.00 ppm), Nitrite-Nitrogen (0.06 ± 0.01 ppm), and Nitrate-Nitrogen (1.80 ± 0.10 ppm). Additionally, four indigenous ammonia-oxidizing bacteria were isolated from a zero-water exchange *Channa striata* rearing cement tank, which had been maintained for 15 days. The tank was subjected to daily ammonia spiking at different concentrations (C = 0 ppm; T1 = 1 ppm; T2 = 2 ppm; T3 = 3 ppm; T4 = 4 ppm). All four microbial strains were Gram-positive.

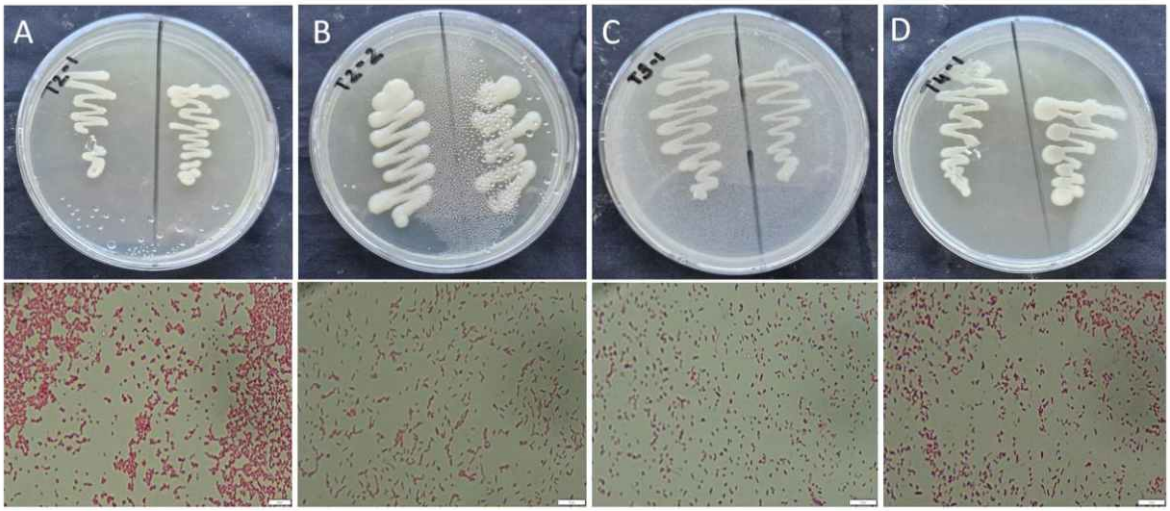

Figure 1. (A) Plate T2-1 colonies are gram positive, cocci (B) Plate T2-2 colonies are gram positive, rods (C) Plate T3-1 colonies are gram positive, coccobacilli (D) Plate T4-1 colonies are gram positive, cocci


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3.2. Aquatic Environment and Health Management Division

3.2.1 Risk assessment of E-waste leachates to aquatic microalgae and fish under climate change scenario and developing potential remediation approach

Project duration: 2024-2027

Principal Investigator
Saurav Kumar

Co-Principal Investigators
S.P. Shukla, Kundan Kumar, Vidya Shree Bharti, Megha K. Bedekar

The rapid evolution of electronic technology, combined with the rapid obsolescence of products, has compounded the issue of e-waste. Inadequate recycling and processing of e-waste components eventually lead to contamination of aquatic systems. The objective of the present study was to evaluate the impact of e-waste leachate on aquatic microalgae under experimental conditions. Two personal computer motherboards (PCMB), weighing 550 g and 580 g (Figure 1), sourced from end-of-life computers used in consumer electronics at the Internet & Communication Technology (ICT) Cell, ICAR-CIFE, Mumbai, were used to obtain leachates for further exposure experiments. The pieces of PCMB were submerged in a static tank of lake water from Powai Lake, with a soaking ratio of e-waste to freshwater at 1:10 (200 g of e-waste for 2000 mL of water). Water quality parameters and leachate profiles were monitored fortnightly over 30 days, following the United States Environmental Protection Agency (USEPA, 2003) Method 6010B, using inductively coupled plasma–mass spectrometry (ICP-MS) at the Institute of Chemical Technology, Mumbai. Heavy metals, including aluminum, nickel, copper, zinc, arsenic, and strontium, were detected in the leachate solution samples collected on days 30 and 45, while chromium, cobalt, cadmium, and lead were not detected in the samples. An acute toxicity test was conducted using five different diluted solutions from the stock leachate (100%, 75%, 50%, 25%, and 0% (control: no e-waste leachate)) for *Chlorella vulgaris*, according to OECD guidelines 201 (OECD, 2006) for 168 hours (7 days), with modifications as needed. Based on the growth rate (μ) of the *C. vulgaris* population, significant ($p < 0.05$) differences in growth inhibition were observed at various concentrations of e-waste leachate exposure. During the exposure period, the percent growth inhibition observed was 14.71% for the 25% treatment, 19.33% for the 50% treatment, 22.83% for the 75% treatment, and 53.58% for the 100% treatment (Figure 2). There was a significant decrease ($p < 0.05$) in chlorophyll a, b, and total chlorophyll levels in *C. vulgaris* exposed to e-waste leachate compared to the control groups.

Figure 1: The formation of e-waste leachates using non-acidic static process using two personal computer mother boards (PCMB) immersed in lake water and incubated for 30 days.

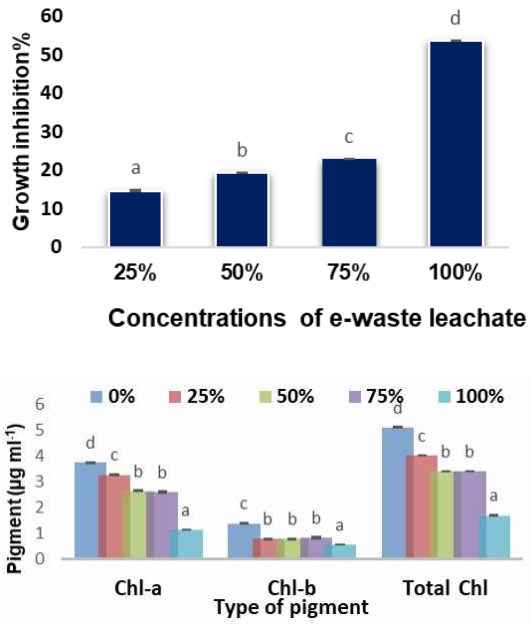


Fig. 2 The impact of e-waste leachate on the (a.) Growth Inhibition (%I) & (b) Chlorophyll pigments of Chlorella vulgaris. Data are presented as mean ± standard error.

3.2.2 Application of Heterologous Prime and Boost Strategies for Augmentation of Immunoprophylaxis in Nile Tilapia, *Oreochromis niloticus*

Project duration: 2022-2025

Principal Investigator
Jeena K.

Co-Principal Investigators
Megha K. Bedekar, Gayatri Tripathi, Madhuri Pathak

Inactivation of *Streptococcus agalactiae* was performed using various methods, with heat inactivation selected as the protocol for downstream processing. Heat-inactivated *S. agalactiae* and beta-glucan extracted from yeast cells were used as immunogens for the study during the reporting period. The prepared immunogens were evaluated by immunizing fish. Immunogenicity was assessed by analyzing phagocytic activity, lysozyme activity, opsonophagocytic assays, and the percentage of survival after a bacterial challenge post-immunization. The percentage survival was calculated at 66.6% in the inactivated *S. agalactiae*-immunized group following a challenge with *S. agalactiae*. A prime-and-boost approach of immunization was employed, using heterologous immunogens—beta-glucan and inactivated bacteria. The immunological analysis and survivability of fish immunized using the prime-and-boost approach were evaluated during an experimental gram-positive bacterial challenge. The longevity of the prime-and-boost immunization was estimated to be one to two months, and further experiments for evaluating longer durations of protection are ongoing. A primary culture of Tilapia head-kidney macrophages was established in vitro to analyze the prime-and-boost immunization approach. Macrophage cultures were characterized by staining and immunofluorescence, targeting and localizing the IBA1 protein on macrophages. The expression of epigenetic markers in macrophages during the prime-and-boost immunization was detected, and gene expression was quantified as the mean fold change in mRNA levels in stimulated head-kidney macrophages. In vitro analysis of heterologous prime-and-boost immunization using beta-glucan and inactivated *Streptococcus agalactiae* in Tilapia head-kidney macrophages was performed. The study successfully established the primary culture of Tilapia head-kidney macrophages as a model for studying trained immunity in fish. The immunoprotective efficacy of killed *S. agalactiae* was elucidated, and immune training was validated as an effective immunization strategy for fish aquaculture.

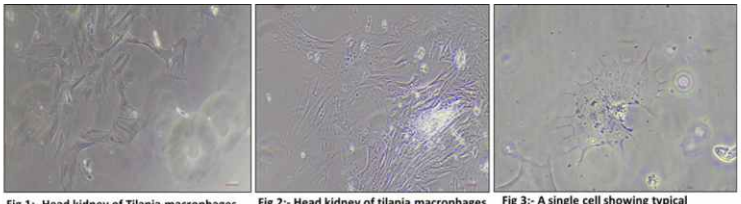
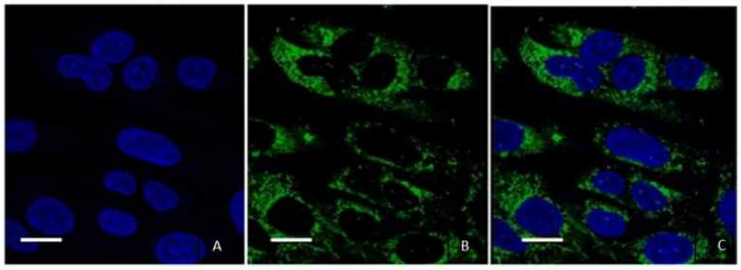


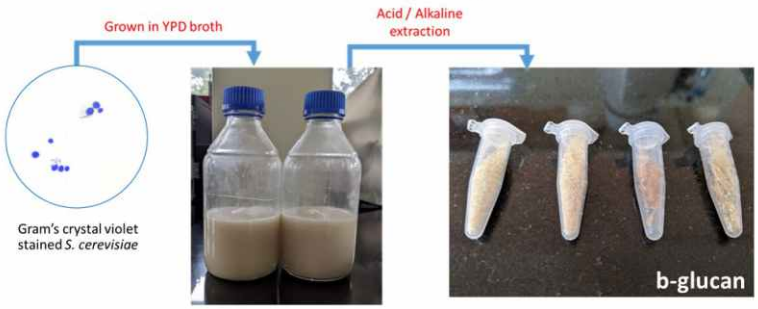
Fig 1:- Head kidney of Tilapia macrophages observed under 20x inverted microscope

Fig 2:- Head kidney of tilapia macrophages observed under 10x inverted microscope

Fig 3:- A single cell showing typical macrophage morphology (cropped image)



Localization of IBA1 protein in macrophages with Anti-IBA1. A: blue indicates nucleus stained with DAPI, B: Green indicates IBA1 fluorescence, C: Merged



3.2.3 Bioprospecting of thermotolerant freshwater microalgae in climate change scenario

Project duration: 2022-2025

Principal Investigator
S.P. Shukla

Co-Principal Investigators
Kundan Kumar, Saurav Kumar, Tincy Verghese

Unialgal populations of *Spirulina (Arthrospira) platensis* were cultured in CIFE medium at three different temperatures (24 ± 1°C; 30 ± 1°C and 40 ± 1°C) for 5 days. The biomass was harvested and the elemental composition was analyzed. The protein content in the biomass produced at 24 ± 1ºC was 59.31 % in the CIFE medium however, it increased to 65.93 % in the cultures exposed to 30 ± 1ºC for the same duration. The biomass produced at 30 ± 1ºC in the modified CIFE medium showed a decrease in protein content from 65.93% to 52.88%. A long term exposure (5 and 12 days) to 40 ± 1ºC exhibited a pronounced decline in protein content to 42.62% after five days of exposure. A continuous exposure of 12 days decreased the protein content to the level of 17.0% compared to the control (CIFE medium, 24 ± 1°C). An increase in protein content from 17 % to 19.69 % was recorded in the modified CIFE medium where the concentration of Sodium bicarbonate and Sodium nitrate was increased. The proximate analysis of the biomass harvested after an exposure to 40 ± 1°C for 72 hours in the modified medium showed 36.34% increase in protein, 3.35 folds increase in lipid content and a slight decreases (11.6%) in fiber content. The findings suggest that a short term exposure (5days) at 30 ± 1ºC enhanced the protein content in the biomass that reflects the thermo-tolerant attribute of *Spirulina platensis*. The possible reason for the enhanced protein synthesis may be the up-regulation of the synthesis of thermo-tolerant proteins to protect the cells from damage at higher temperature. An exposure to 40 ± 1°C for 5 days showed a clear contrast in the protein, lipid and fiber contents of the biomass cultured in normal and modified compositions of CIFE medium. The protein content increased to 31.70 % in modified medium from 23.25 % when compared with normal composition. The lipid content showed a remarkable increase to 3.92 % in the modified medium. This value is 3.35 folds higher compared to the biomass produced in normal composition of the medium. The findings endorse that modification of the basal composition of the CIFE medium where the concentrations of sodium bicarbonate and sodium nitrate were increased (bicarbonate from 8.0 to 10.0 gram; nitrate from 2.0 to 3.0 gram) imparts the thermo-tolerance mainly through enhanced lipid synthesis. Overall, the study provides baseline information about the potential changes in the proximate composition and elemental profile (C, H, N, S) of microalgae biomass in general and *Spirulina* in particular. It is concluded that the modifications in the culture media can overcome the detrimental effects of higher temperature in the climate change scenario through metabolic adjustments.

3.2.4 Development of Nano-Fertilizer enriched biochar and its effect on water productivity, fish growth and GHGs emission in aquaculture

Project duration: 2023-2026

Principal Investigator
Vidya Shree Bharti

Co-Principal Investigators
Rupam Sharma, A.K. Verma, Saurav Kumar, Suman Manna

The objectives of the study are to evaluate the nutrient release pattern of biochar-nanofertilizer nutrient complex, toxicity of the nanofertilizer and the effects of the complex on growth of the fish. End-point toxicity of Nano urea and Nano DAP solution for *Labeo rohita* (average weight 3±0.8 g) was determined following OECD test no. 203. The range finding (1, 5, 10, 15 and 20 ppm) for Nano urea and (1, 5, 10, 15, 20 and 25 ppm) for NanoDAP and final definitive test was performed in the range of 8, 9, 10, 11 and 12 ppm of nitrogen from Nano urea solution and 12, 14, 16, 18 and 20 ppm of Nano DAP solution respectively, a control group (without nano urea or NanoDAP solution) was maintained during the experiment. The end-point acute toxicity of nano fertilizers, i.e. Nano urea and Nano diammonium phosphate (Nano DAP), for *L. rohita* was estimated and 96-hour LC50 values was estimated 9.77 and 15.137 ppm respectively.

In another microcosm experiment the performance of *Cyprinus carpio* juvenile was evaluated during treatment of biochar-nanofertilizer for the period of 45 days (Figure 1). In this experiment, the sediment nutrient organic carbon and phosphorus availability has increased where biochar is complexed with inorganic fertilizer DAP or nanofertilizer DAP as compared to the control. Weight gain, Survival percentage, Specific growth rate of common carp was significantly higher in treatment where Biochar-NanoDAP composite> Biochar–DAP> DAP> Nano-DAP> Control. Dose dependent toxicity of nano-fertilizers to aquatic organisms and application of Biochar nanofertilizer composite enhances the weight gain and productivity of the aquatic system and enhances carbon content of the sediment and improves the sediment and water parameters.

3.3. Fisheries Resources, Harvest & Post-Harvest Management Division

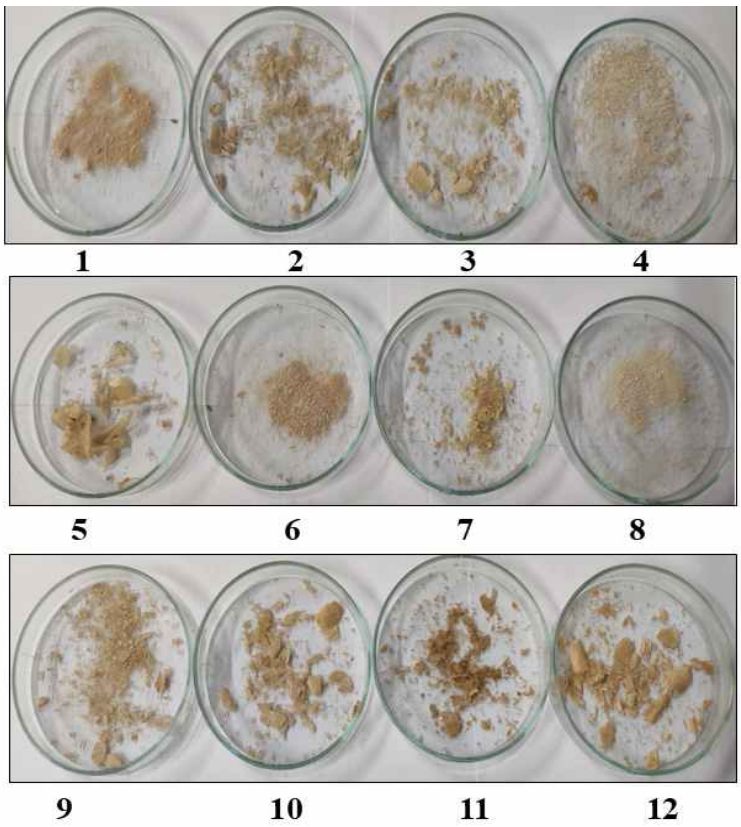
3.3.1 A novel approach to fish biowaste utilization by marine bacteria-mediated production of industrially valuable collagenases

Project duration: 2024-27

Principal Investigator
Sanath Kumar H

Co-Principal Investigators
Manjusha L , Nayak B.B

In our efforts to harness the power of marine microorganisms, a total of 19 bacterial strains isolated from seawater were evaluated for their ability to degrade fish scales—an indicator of collagen breakdown—using a medium of 0.25% peptone in seawater (20 ppt salinity). Impressively, 10 of these isolates demonstrated complete degradation of scales within just 15 days, highlighting their potential for biotechnological applications. To better understand these potent strains, partial 16S rRNA gene sequencing was conducted. This revealed that six of the active isolates belonged to various species of Vibrio, while the remaining were identified as *Exiguobacterium profundum*, *Acinetobacter* spp., *Kerstersia gyiorum*, and *Nitratireductor* spp. Further biochemical testing confirmed that select isolates were producing collagenase—an enzyme critical for collagen degradation—using the azocoll assay. We are currently advancing this research by purifying collagenase through gel filtration techniques and conducting enzyme kinetics studies to characterize their efficiency and potential applications. This promising line of research could pave the way for sustainable solutions in waste management, bioprocessing, and even marine biotechnology.



Degradation of fish scales by bacteria (1-12) isolated from sea water

3.3.2 Development of molecular methods for detection and quantification of *Cronobacter* spp. of human health significance in seafood

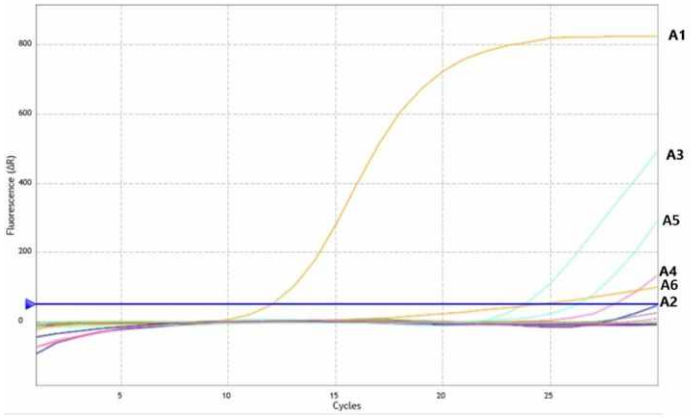
Project duration: 2022-25

Principal Investigator
Manjusha L.

Co-Principal Investigators
B. B. Nayak, Sanath Kumar H.

In a targeted effort to develop a rapid and reliable detection method for *Cronobacter sakazakii*, a set of virulence genes—*omp, hly, rpB, glu, wzz,* and *fhu*—were selected as genetic markers for primer design. Gene sequences were sourced from the NCBI GenBank database, and 11 primer sets were generated using the Primer-BLAST tool. Among these, the primer sets wzz II, hly II, and fhuF showed high specificity, successfully amplifying DNA only from *C. sakazakii* ATCC 29544, and not from other organisms. After a thorough evaluation of sensitivity and specificity, the wzz II primer—targeting the wzzB gene associated with desiccation tolerance—was selected for further application. The real time PCR using *wzz*-specific primers showed high sensitivity of 100 cells/g of *C. sakazakii* in artificially spiked shrimp.

This primer was then integrated into a real-time PCR (RT-PCR) platform, with conditions optimized to ensure accurate and sensitive detection. Ongoing work is focused on applying this newly developed RT-PCR assay to screen seafood samples for the presence of *C. sakazakii*. This diagnostic advancement is expected to significantly enhance food safety monitoring, particularly in marine and seafood-related sectors.



S. no.	Cq (ΔR)	Concentration (cfu/g)
A1 (*C. sakazakii* ATCC 29544)	12.10	-
A2 (Negative control)	No Cq	-
A3	23.88	1.24×10^5
A4	28.04	1.24×10^4
A5	24.36	1.24×10^3
A6	29.86	1.24×10^2
A7	No Cq	1.24×10
A8	No Cq	1.24

3.3.3 Taxonomical, biochemical evaluation and utilisation of order Dictyotales (Phaeophyceae) – brown algal species

Project duration: 2021-24

Principal Investigator
Layana P

Co-Principal Investigator
Annam Pavan Kumar

As part of our ongoing exploration of marine bioresources, 11 species of Padina—a genus of brown seaweeds—were collected from diverse coastal regions of India, including Tiruchendur, Mandapam, and Hare Island in the Gulf of Mannar (Tamil Nadu, East Coast), and from Ratnagiri and Malvan (Maharashtra Coast), as well as Okha and Shivrajpur (Gujarat Coast) on the West Coast. To evaluate their antioxidant potential, hydroalcoholic extracts were prepared using three different solvent systems: water, methanol, and a 1:1 mixture of water and methanol. The extracts were analyzed through key antioxidant assays, including Total Phenolic Content (TPC), DPPH

radical scavenging activity, Ferric Reducing Power, and Total Antioxidant Capacity. Among the species studied, *Padina fraseri*, *P. crassa*, and *P. tetrastromatica* from the Ratnagiri region stood out for their strong antioxidant activity. These promising findings suggest their potential for further development in functional foods and nutraceutical applications. This study not only highlights the rich biodiversity along India's coasts but also opens new avenues for the sustainable use of marine algae in health and wellness industries.

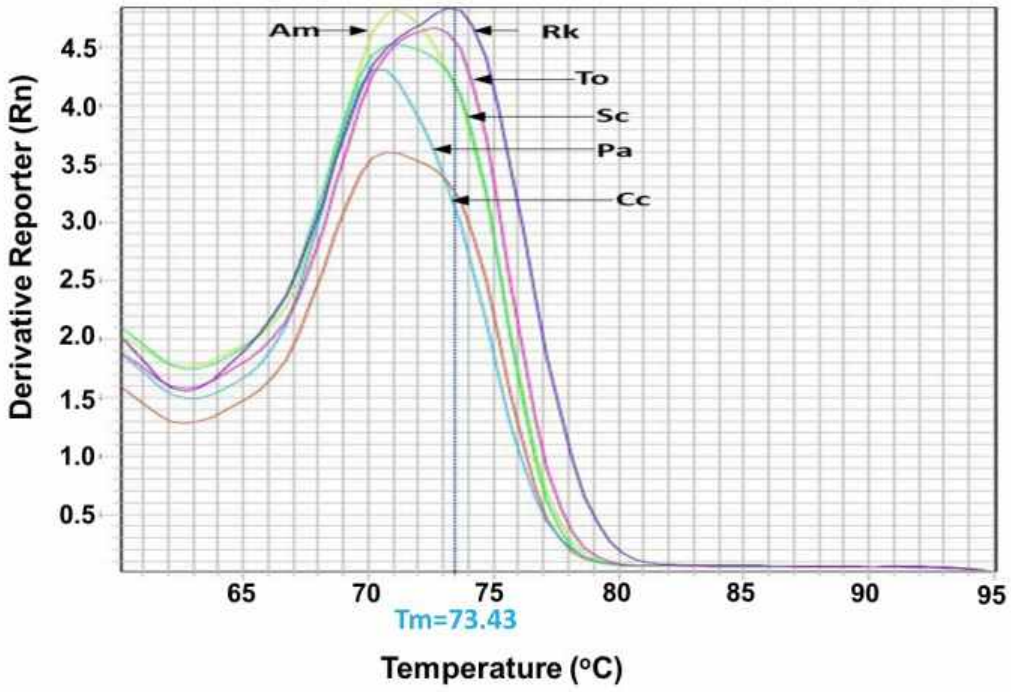
3.3.4 Development of reference DNA mini-barcodes and associated high-resolution melting (HRM) profiles for authentication of fish species in processed products

Project duration: 2021-24

Principal Investigator
A. Pavan Kumar

Co-Principal Investigators
Aparna Chaudhari, Manjusha, A.K. Jaiswar, Gireesh-Babu, Pankaj Kishore

Species-specific mini-barcodes integrated with High-Resolution Melting (HRM) analysis were successfully developed for the accurate identification of twenty marine species. This approach enabled the generation of unique HRM profiles, with each species exhibiting a distinct melting temperature (Tm), thereby facilitating precise and rapid identification. The melting temperatures recorded ranged from 65.88°C to 83.73°C, clearly distinguishing the species from one another. For instance, *Rastrelliger kanagurta* showed a Tm of 74.3°C, *Euthynnus affinis* at 73.1°C, *Scomberomorus commerson* at 72.8°C, *Pampus argenteus* at 70.9°C, *Arius maculatus* at 71.6°C, and *Charybdis feriata* at 71.2°C. On the lower end of the scale, *Nibea maculata* displayed a Tm of 65.88°C, *Acanthosepion pharaonis* at 66.69°C, and *Uroteuthis* (Photololigo) *duvaucelii* at 68.71°C. These consistent and species-specific melting profiles demonstrate the robustness and reliability of the mini-barcode-HRM technique in differentiating marine species with high precision. Further validation studies using processed seafood samples are currently underway to assess the method's effectiveness in real-world applications such as seafood traceability and quality assurance.



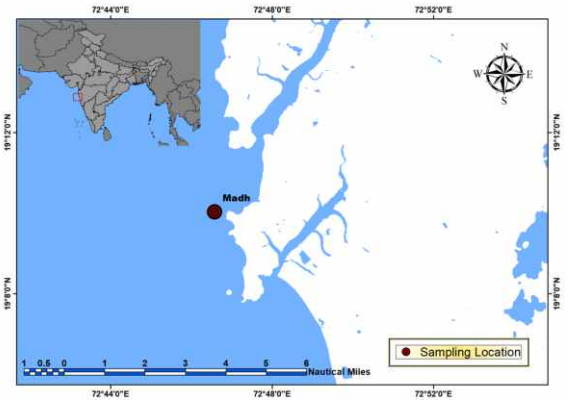
3.3.5 Modification of Dolnet for sustainable fisheries management along Mumbai coast

Project duration: 2022-25

Principal Investigator
Karankumar K. Ramteke

Co-Principal Investigators
Asha T. Landge, Abuthagir Iburahim, Shobha Rawat , Dayal Devadas

Experimental fishing was using a 45-meter dolnet incorporated three square mesh panels at the cod end to assess species retention and selectivity. The upper panel (50 mm mesh, 1.3 m length) recorded 52 species, the middle panel (35 mm mesh, 4 m length) noted 61 species, and the lower panel (10 mm mesh, 5 m length) registered 54 species. The trials identified a total of 78 species from 38 families and 19 orders, including elasmobranchs, finfish, shrimps, prawns, lobsters, crabs, cephalopods, and mantis shrimp. Dominant species observed included *Acetes indicus, Cynoglossus arel, Coilia dussumieri, Parapenaeopsis stylifera,* and Metapenaeus brevicornis. Key species with high retention or capture rates were *Cynoglossus arel, Coilia dussumieri, Metapenaeus brevicornis, Parapenaeopsis stylifera, Johnius belangerii, Trypauchen vagina, Solenocera crassicornis, Rastrelliger kanagurta, Charybdis callianassa, and Lepturacanthus savala.* The traditional dolnet yielded an average catch of 15 kg per haul, while the modified panels recorded 2.8 kg (upper), 3.5 kg (middle), and 8.7 kg (lower). Plastic waste constituted 3.51% of the total catch, peaking in March. Juveniles accounted for 6%, 12%, and 47% of the upper, middle, and lower panel catches.



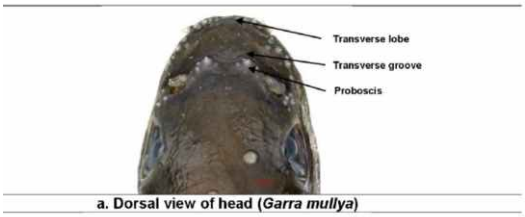
3.3.6 Ecological assessment and Multi-metric Index development for selected riverine ecosystems in Maharashtra, India

Project duration: 2024-25

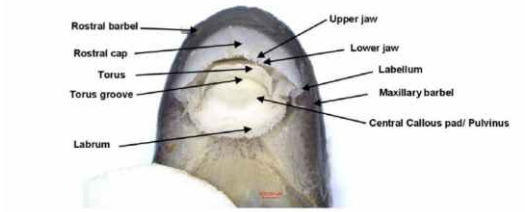
Principal Investigator
Sukham Monalisha Devi

Co-Principal Investigators
Asha T. Langde, Sangeeta Mandal, Karankumar K. Ramteke, Shobha Rawat, Dayal Devadas, Abuthagir Iburahim S., Shivaji Dadabhau Argade

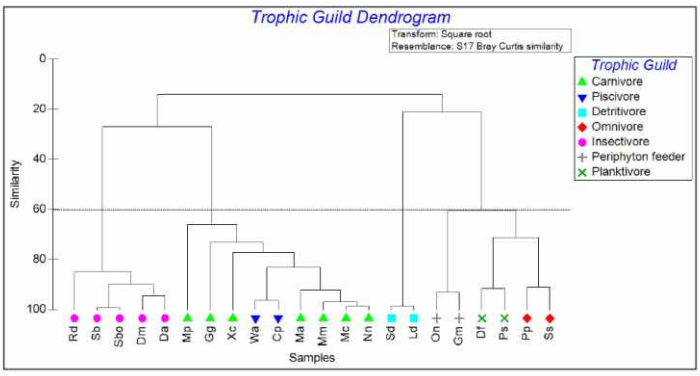
A comprehensive study involving 573 specimens of *Garra* collected from multiple rivers in Maharashtra—including the Ulhas, Tansa, Koyna, Patalganga, Kundalika, and Bhatsa—employed an integrated taxonomic approach to confirm all samples as Garra mullya. Interestingly, the species exhibited three distinct snout morphotypes: Type-R, characterized by numerous unicuspid tubercles, a transverse lobe, and a bilobed proboscis; Type-MR, with fewer tubercles and a weakly developed proboscis; and Type-S, distinguished by a smooth snout lacking tubercles. Despite these variations, all morphotypes shared a common transverse groove. To delineate these forms, researchers measured 28 morphometric and 11 meristic traits, identifying key distinguishing proportions such as maxillary barbel length, head depth, head length, and pectoral fin length relative to standard length, using Linear Discriminant Analysis (LDA). While Principal Component Analysis (PCA) did not show a clear separation, statistical analyses using the Kruskal-Wallis test and Dunn's post hoc test revealed significant differences in specific meristic traits. Additional differentiation methods included otolith structure analysis, scale patterning, X-ray imaging, and DNA barcoding via the mitochondrial COI gene. The genetic analysis showed intraspecific divergence ranging from 0.0001 to 0.0205, and a Neighbour-Joining tree helped clarify phylogenetic relationships, emphasizing the morphological plasticity of *Garra mullya* in the Western Ghats. Alongside morphological and genetic studies, a trophic guild analysis was also conducted. Dietary examinations revealed 33 different food items, suggesting niche partitioning among species. Most individuals were identified as mid-level carnivores, playing a vital role in ecosystem energy dynamics and trophic balance. The carnivorous guild, consisting of seven species, was the most diverse, followed by insectivores with five species. Other functional groups—piscivores, detritivores, phyto planktivores, omnivores, and planktivores - each comprised two species. Among planktivores, the diet was dominated by Bacillariophyceae (50%), followed by Chlorophyceae (46.1%) and Cyanophyceae (15.3%), offering deeper insights into the feeding ecology and ecosystem roles of these fish.



a. Dorsal view of head (*Garra mullya*)



b. Ventral view of oral and gular morphology (*Garra mullya*)



3.4. Fish Nutrition, Biochemistry & Physiology Division

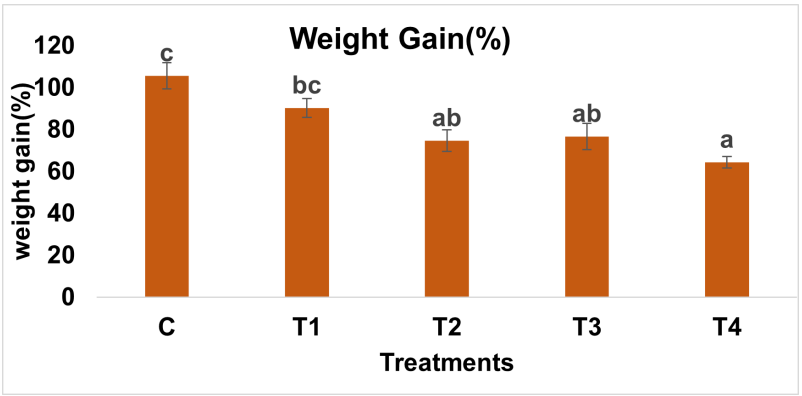
3.4.1 Enhancing the physiological and metabolic adaptive mechanisms of Tilapia to hyper-thermal stress through dietary interventions and environmental manipulation

Project duration: 2022-2025

Principal Investigator
Tincy Varghese

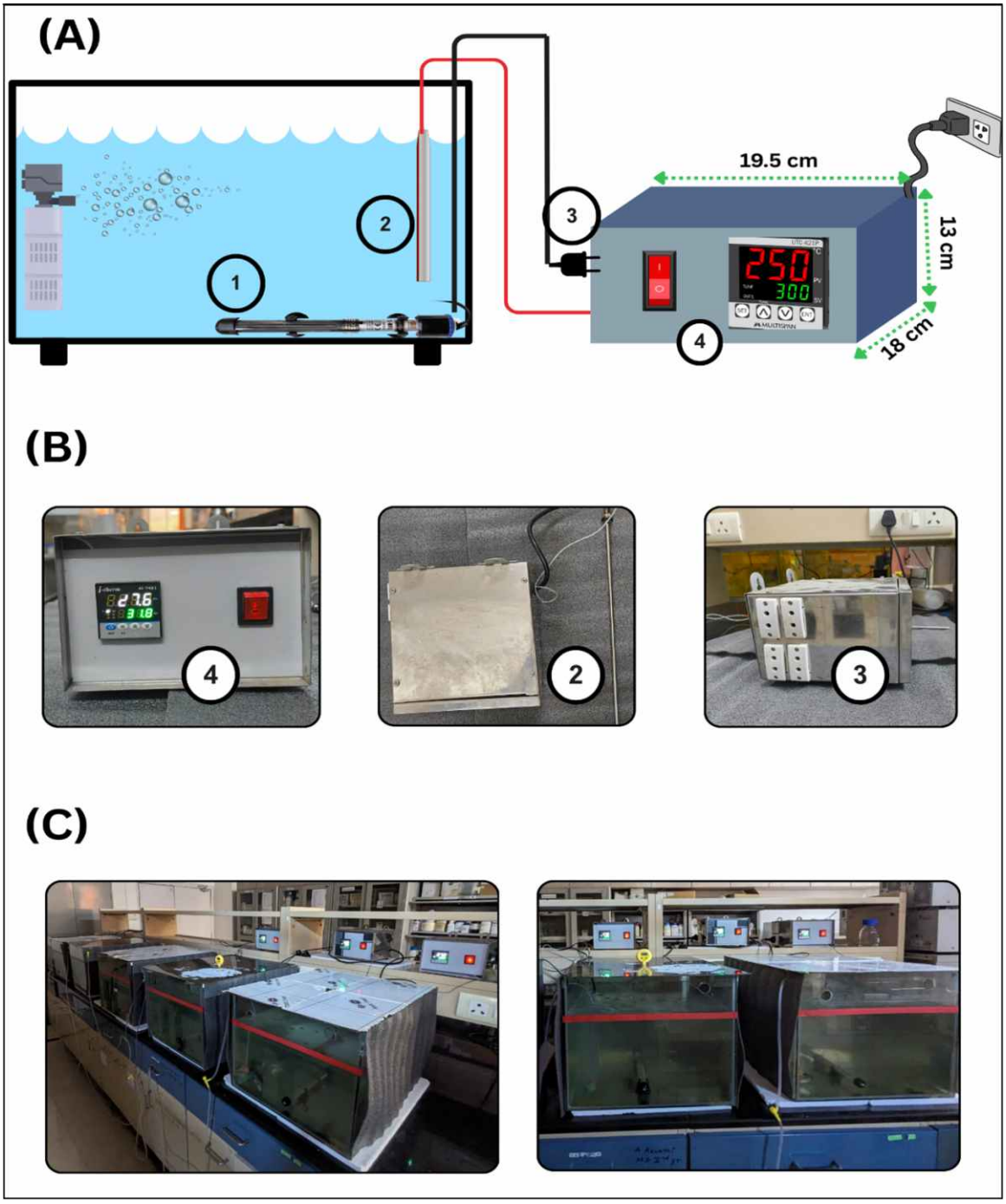
Co-Principal Investigators
Subodh Gupta, Sikendra Kumar, Md. Aklakur, Saurav Kumar

A thermal aquarium setup was designed to expose fish to hyperthermal stress (Fig.1.1). The effects of dietary metabolic modifier supplementation (0.5%) on genetically improved farmed Tilapia (GIFT) under normal (28°C) and high (33°C) temperature conditions were investigated. The GIFT tilapia fish was procured from RGCA, Chennai, and acclimatized for a week at an ambient temperature of 28.3 ± 0.8°C. The study was conducted over a 60-day feeding trial using two isonitrogenous (34% crude protein), isolipidic (12% lipid), and isocaloric (20.41 MJ/kg) diets. The control diet, P34L12, contained 34% protein and 12% lipid, while the test diet consisted of P34L12 supplemented with 0.5% metabolic modifier. The fish were reared in a freshwater recirculatory aquaculture system throughout the trial. A 60-day feeding trial was conducted using two isonitrogenous (34% crude protein) and isolipidic (12% lipid) diets. Metabolic modifier supplementation significantly enhanced growth performance, particularly at high temperatures, with the 33°C metabolic modifier-supplemented group showing the highest final weight (30.81g) and specific growth rate (2.77% day^{-1}). Feed efficiency improved with metabolic modifier supplementation, reducing the Feed Conversion Ratio at both temperatures. Body composition analysis revealed decreased crude lipid content with metabolic modifier supplementation, suggesting improved lipid utilization. Serum lipid profiles showed increased levels of all measured lipids with metabolic modifier supplementation, indicating enhanced lipid metabolism and transport. The study demonstrates that 0.5% metabolic modifier supplementation effectively mitigates the adverse effects of high-temperature stress in GIFT tilapia, improving growth performance and metabolic efficiency. These findings highlight metabolic modifier potential as a valuable feed additive in tilapia aquaculture, especially in regions prone to elevated water temperatures. In conclusion, Metabolic modifier supplementation (0.5%) in GIFT tilapia diets showed significant benefits, particularly under high-temperature conditions at 33°C, such as improved feed efficiency and reduced FCR, altered body composition, reduced lipid content, and potentially improved lipid utilization and enhanced lipid metabolism and transport, as evidenced by serum lipid profiles. These results suggest that metabolic modifier supplementation can effectively mitigate some negative effects of high-temperature stress in GIFT tilapia, improving their growth performance and metabolic efficiency.



WGP and thermal growth coefficient of gift

Another experiment was conducted in inland saline water with feeding of two nutraceuticals on GIFT tilapia cultured in 10 ppt and 15 ppt ISW under high-temperature conditions (35.3°C). Growth performance analysis revealed that KCl and organic nutraceutical supplementation significantly enhanced final body weight and weight gain percentage at both salinities despite the high-temperature stress. Lec ×10 treatment yielded the highest FBW (19.89 g) and WG (366.07%), while at 15 ppt, growth parameters were moderately reduced at HT yet remained highest in the KCl and nutraceutical-supplemented group. Despite the thermal stress, this stress-mitigating effect corresponded with enhanced survival rates in nutraceutical-supplemented groups. These findings suggest that while the combination of elevated temperature (33.3°C) and salinity induces substantial physiological stress in GIFT tilapia, dietary supplementation of organic and inorganic metabolic modifiers mitigates these adverse effects through improved osmoregulatory capacity and reduced metabolic expenditure, ultimately enhancing growth performance and survival under thermally challenging inland saline waters.



3.4.2 Reproductive endocrinology and captive breeding of one-striped spiny eel, *Macrognathus aral*

Project duration: 2022-2025

Principal Investigator
Prem Kumar

Co-Principal Investigators
Sukham Munilkumar
Rupam Sharma

The peacock eel (*Macrognathus aral*), valued both as a food and ornamental fish, holds significant commercial importance in Assam, Bihar, West Bengal, and across North-East India. Recognizing its potential, we have successfully developed a comprehensive captive seed production technology for the species. This breakthrough encompasses broodstock development, induced breeding, and larval rearing protocols under controlled conditions. In captivity, peacock eels reach sexual maturity at a body weight of 18–25 g, typically after one year of rearing. During the mid of June 2024, mature oozing males and gravid females were observed. In early July 2024, mature female brooders (average weight: 22 g, mean oocyte diameter: 1.45 mm) and males (average weight: 14 g) were selected in a 2:1 male-to-female ratio. These fish were administered a combination of LHRHa and domperidone, with females receiving a dose of 200 µl and males half that amount. Spawning occurred after an average latency period of 18 hours. Each female produced an estimated 3,500 eggs, which were greenish, spherical, and adhesive in nature. To facilitate fertilization and secure attachment, the roots of the aquatic plant *Pistia* were used as an egg-laying substrate . The fertilization rate was recorded at 45%, and the hatching rate at 20%. Eggs incubated at a water temperature of 28°C hatched within 18 hours. Newly hatched larvae, measuring 1.65 to 1.85 mm, were characterized by a prominent oval-shaped yolk sac. These larvae were transferred to outdoor nursery tanks, where *Pistia* plants served as natural hideouts. The yolk sac was absorbed by five days post-hatching (dph), at which point exogenous feeding was initiated using *Artemia* nauplii. Feeding with *Artemia* continued for 30 days, after which weaning onto a micro-particulate diet began. The resulting fry are currently being reared in outdoor tanks . This successfully demonstrated protocol marks a significant advancement in the captive breeding of peacock eel, paving the way for its large-scale seed production and sustainable aquaculture development in the region.

3.4.3 Utilization of Jojoba (*Simmondsia chinensis*) and mahua (*Madhuca indica*) cake/ meals based products in aquafeed

Project duration: 2022-2025

Principal Investigator
Manish Jayant

Co-Principal Investigator
Ashutosh D Deo, Shamna N, Subodh Gupta, Kiran Rasal

Standardization of the process for the preparation of protein concentrate from mahua cake

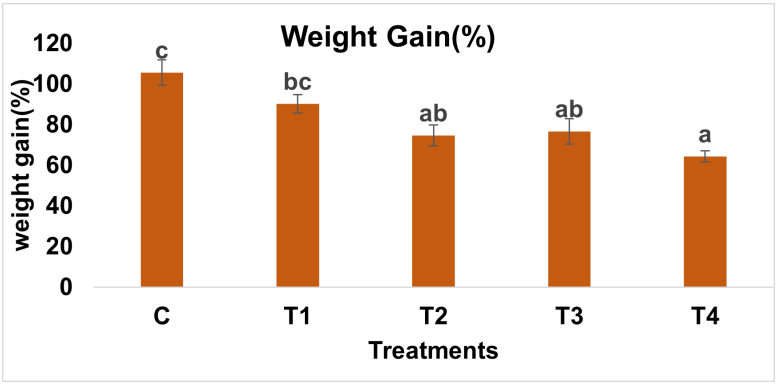
Mahua seed cake (MSC), a by-product with potential nutritional value, was processed to extract protein using an alkaline solubilization–isoelectric precipitation method, following protocols adapted from *Fawole* et al. (2016) and *Jayant* et al. (2021). To optimize the process, 16 different pH combinations were tested—ranging from solubilization at pH 11.0 to 12.5 and precipitation at pH 4.0 to 5.5. Among all combinations, the highest dry matter recovery (12.85%), protein recovery (71.01%), and crude protein (44.43%) content in the concentrate were recorded at pH 12.5 (solubilization) and pH 4.0 (precipitation).

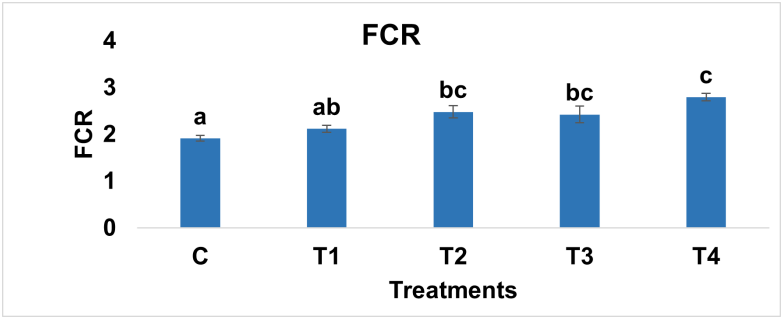
Proximate composition (dry weight basis) of MSC and MPC

The MSC comprised 7.06% moisture, 18.02% crude protein, 8.6% ether extract, 8.86% crude fibre, 59.03% nitrogen-free extract, and 5.49% total ash, whereas the MPC contained 6.64% moisture, 34.33% crude protein, 5.8% ether extract, 2.28% crude fiber, 51.59% nitrogen-free extract and 6% total ash. The gross energy value increased from 425.106 (kcal $100g^{-1}$) to 460.293 (kcal $100g^{-1}$) in protein concentrate when compared to MSC.

Feeding trials to study the possible substitution of soybean meal by MPC

Five iso-nitrogenous (30% crude protein) and isolipidic (6%) and iso-caloric (375 kcal DE/100 g) experimental diets were formulated and prepared. The control diet was formulated solely with 100% soybean meal without the mahua protein concentrate inclusion, whereas SBM was replaced by MPC at different substitutional levels, i.e., 25%, 50%, 75%, and 100% in the treatment diets and denoted as T1, T2, T3, and T4, respectively. Dietary MPC inclusion significantly affected the growth rates, feed conversion, and nutrient utilization of *L. rohita* fingerlings ($p<0.05$). Best growth performance and feed conversion (minimum feed conversion ratio) were observed in *L. rohita* in the control group ($P<0.05$). However, the growth rates in the T1 group did not differ from the control group ($P>0.05$). Substitution of more than 25% (T1 group) adversely affected the growth rates and feed utilization in rohu fingerlings ($P<0.05$). There were no significant differences ($P>0.05$) in lipase and amylase activities among the different experimental groups, whereas the protease





activities in *L. rohita* fingerlings were found to be significantly different (P<0.05). The T1 group exhibited the highest protease activity, followed by T3 and the control group (P<0.05). In the liver, a significant difference was observed in LDH activity among different experimental groups (P<0.05). In the liver, the control exhibited the lowest hepatic LDH activity (P<0.05); however, it did not differ with the T1 and T2 groups (P>0.05). At the same time, T3 and T4 groups exhibited the highest LDH activity (P<0.05). Similarly, the lowest MDH activity was found in control and T1 and then increased afterward (P<0.05). SOD activities in the liver and gill of rohu fingerlings were significantly influenced by dietary MPC inclusion (P<0.05). In the liver and gills, the highest SOD activity was recorded in T4, followed by T3, while the lowest activity was found in the control and T1 groups. Meanwhile, the CAT activities in the liver and gills did not vary between control and dietary treatments (P>0.05).

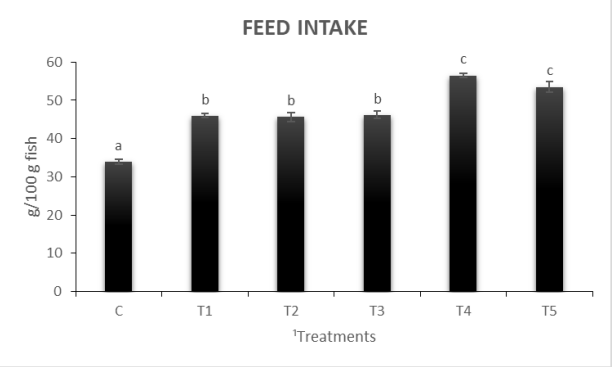
3.4.4 Evaluation of feeds for improved growth and survival of fishes during the winter season

Project duration: 2023-2026

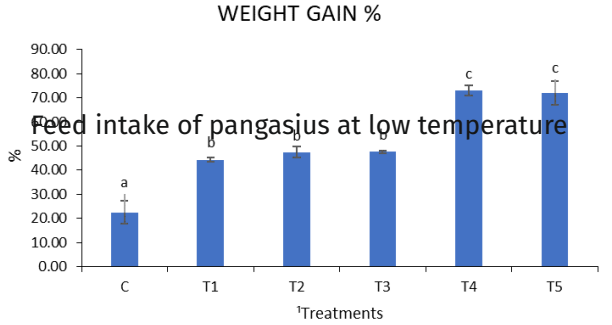
Principal Investigator
Ashutosh D Deo

Co-Principal Investigators
Manish Jayant, Shamna N, Md. Aklakur, Subodh Gupta, Dhalongsaih Reang

A feeding trial was conducted to evaluate the effect of dietary supplementation with propylene glycol and L-carnitine on feed intake, growth performance, survival, and physio-biochemical responses of *Pangasianodon hypophthalmus* fingerlings reared under low-temperature stress (18 ± 1°C) in a recirculatory aquaculture system. Six isonitrogenous (37% crude protein) and isocaloric (410.95 kcal/100g digestible energy) diets were formulated with varying levels of propylene glycol and L-carnitine: control (0%), T1 (1.25% propylene glycol), T2 (1% L-carnitine), T3 (0.625% propylene glycol + 0.5% L-carnitine), T4 (0.3125% propylene glycol + 0.75% L-carnitine), and T5 (0.9375% propylene glycol + 0.25% L-carnitine). The results showed that dietary supplementation significantly improved feed intake, final weight, weight gain, weight gain percentage, specific growth rate (SGR), thermal growth coefficient (TGC), feed efficiency ratio (FER), nutrient utilization, and survival, with the best performance observed in the T5 group, suggesting its effectiveness in mitigating cold stress. To validate the laboratory findings, a field trial was conducted during January–February 2024 at the ICAR-CIFE Powarkheda Centre, where fish fed with WA and WB metabolic modifier-supplemented diets exhibited 60% and 150% additional growth, respectively, under natural winter conditions. These findings confirm that dietary inclusion of propylene glycol and L-carnitine can significantly enhance the cold tolerance and growth performance of *P. hypophthalmus*, offering a promising strategy for sustaining production during winter months.



Feed intake of pangasius at low temperature



WGP of pangasius at low temperature

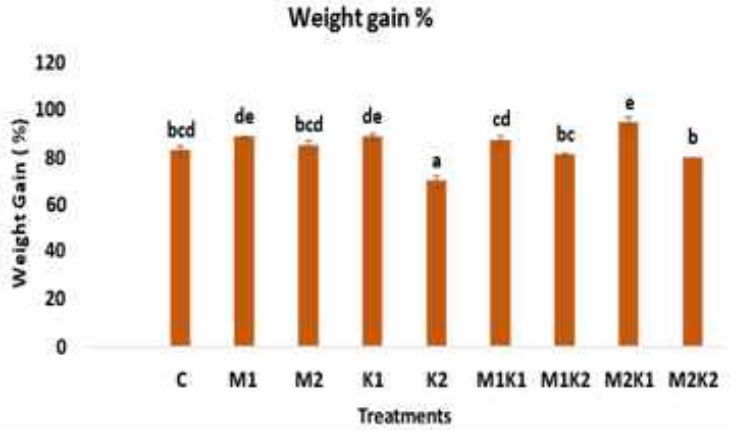
3.4.5 Comparative evaluation of carbohydrate-based prebiotics in enhancing eubiosis in fish

Project duration: 2024-2027

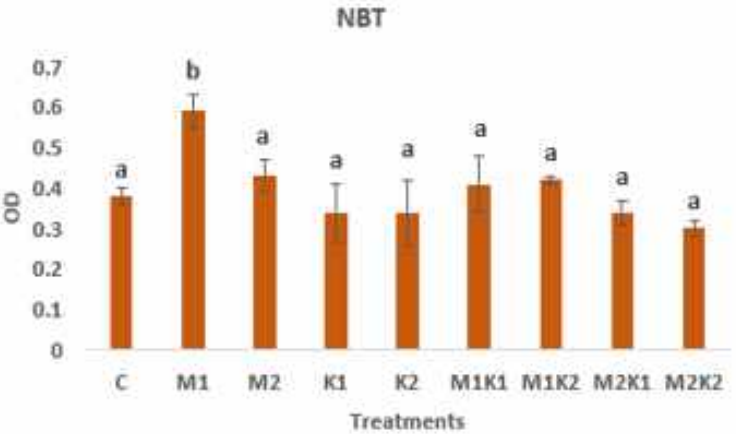
Principal Investigator
Subodh Gupta

Co-Principal Investigator
Aparna Chaudhari, Tincy Varghese, Parimal Sardar

A feeding trial was conducted on *Labeo rohita* fingerlings to assess the effects of dietary supplementation with mannan oligosaccharide (MOS) and potassium diformate (KDF) on growth, nutrient utilization, and physiological responses. Among the treatment groups, M2K1 demonstrated the best growth performance and nutrient utilization, followed by M1 and K1 groups. However, a higher dose of KDF (0.6%) led to a reduction in the Intestine Somatic Index (ISI). Elevated levels of MOS and KDF significantly enhanced protein and carbohydrate metabolic enzyme activities, along with catalase activity, particularly in the M1 group. Serum biochemical analysis revealed higher globulin levels in the K2 group, an elevated albumin/globulin (A/G) ratio in M2K1, and lower serum glucose levels in both the control and M2 groups. To identify optimal symbiotic combinations, an in vitro microbial growth curve study was conducted using three widely known probiotics (*Bacillus subtilis*, *B. amyloliquefaciens*, and *Lactococcus lactis*) obtained from MTCC, IMTECH, Chandigarh, and three prebiotics (MOS, fructo-oligosaccharide [FOS], and xylo-oligosaccharide [XOS]). All probiotic strains exhibited significantly enhanced growth with FOS, while the combination of FOS and XOS particularly promoted the growth of *B. subtilis*, followed by *Lactococcus lactis*. A 60-day field trial involving the dietary inclusion of selected oligosaccharides (MOS, FOS, XOS, and their combinations) in *L. rohita* feed demonstrated that XOS alone resulted in significantly higher growth performance. Notably, the combination of 0.5% MOS and 0.5% XOS yielded the best outcomes in terms of weight gain percentage, specific growth rate (SGR), and feed conversion ratio (FCR), confirming the efficacy of synbiotic formulations in enhancing the overall health and productivity of *L. rohita* under aquaculture conditions.



WGP of rohu after feeding prebiotic and KDF



NBT of rohu after feeding prebiotic and KDF

3.5. Fish Genetics & Biotaechnology Division

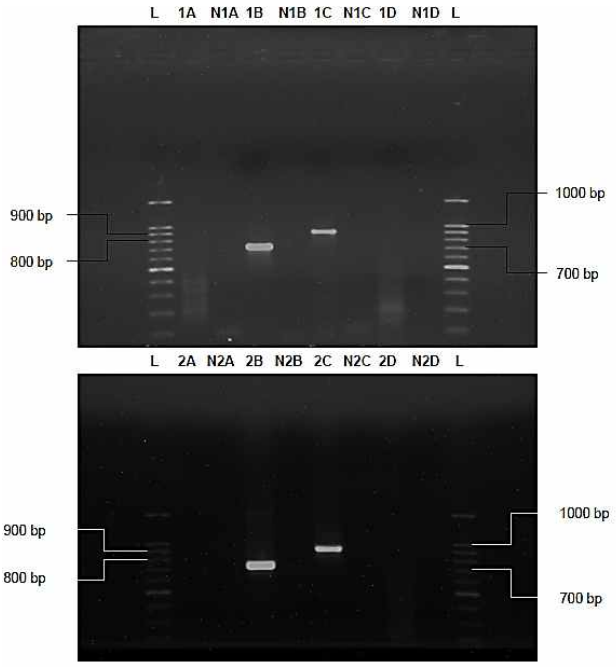
3.5.1 Evaluation of RNA-guided recombinase (RGR) platform for cell-independent and safer genome engineering in zebrafish vertebrate model

Project duration: 2022-25

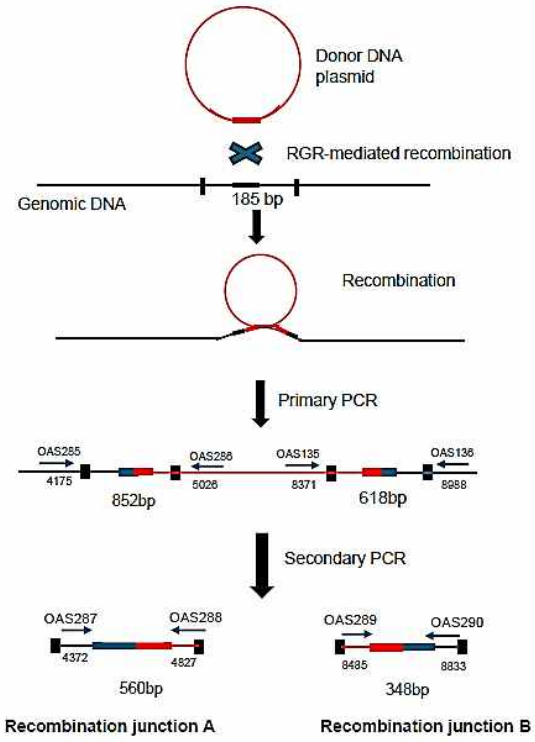
Principal Investigator
Arvind A. Sonwane

Co-Principal Investigators
Aparna Chaudhari, Manoj P. Brahmane, Mujahidkhan A. Pathan, Kiran D. Rasal

This study employed the RNA-guided recombinase (RGR) platform to attempt targeted transgenesis at the Enah-Srp9-1 locus in zebrafish. For this, the RGR platform components were microinjected into embryos at the 2–8 cell stage, and the injected embryos were subsequently reared under controlled conditions. A survival rate of 66.7% and a hatchability rate of 60% were recorded, indicating that the procedure was generally well tolerated. A nested PCR assay was developed to detect the recombination junctions specific to RGR-mediated transgenesis to assess successful targeted integration. Despite the robustness of the assay, no specific amplification of recombination junctions was observed in the tested samples or tissues, suggesting that targeted transgenesis at the selected Enah-Srp9-1 site either did not occur or was below the detection threshold. This result indicates that the efficacy of RGR-mediated targeted transgenesis may be site-dependent, potentially influenced by local chromatin accessibility or nucleosome positioning at the target locus. Additionally, the possibility of mosaicism in the founder (F0) generation could not be ruled out, especially as screening was limited to a single tissue type (fin). These findings underscore the need for further studies involving multiple genomic target sites, broader tissue sampling, and multi-generational (F0, F1, and F2) screening to comprehensively evaluate the potential and limitations of the RGR platform in zebrafish-targeted genome engineering.



Robustness of the designed nested PCR assay revealed using different primer combinations for amplification of control genomic regions



Nested PCR assay to carry out molecular characterization of RGR-mediated recombination junctions

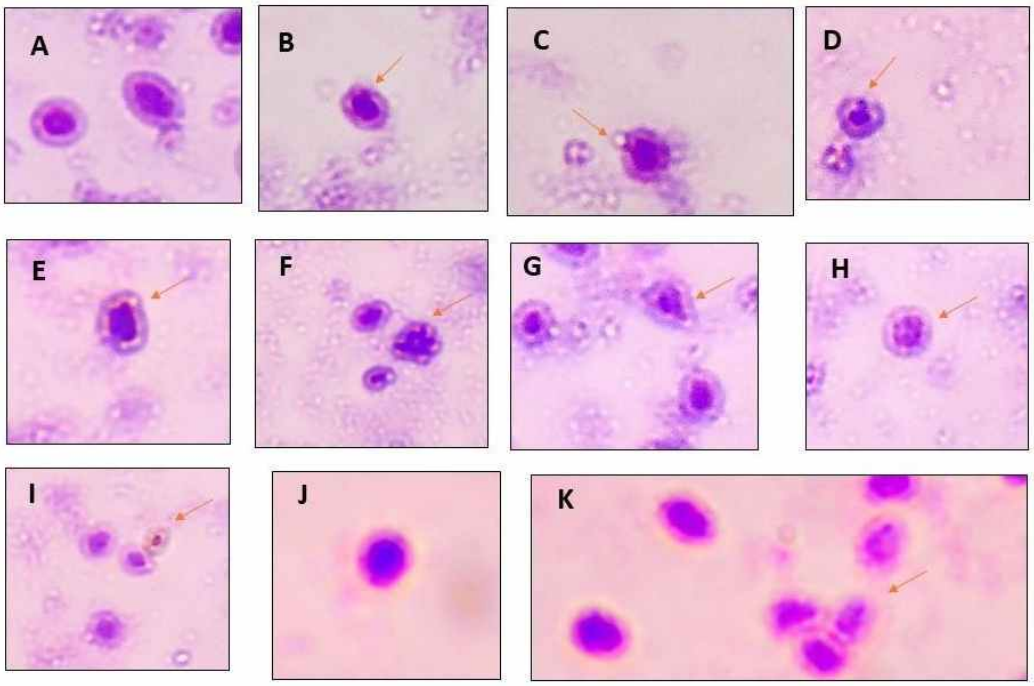
3.5.2 Toxicogenomic responses of microplastics exposure in intertidal bivalve *Gafrarium divaricatum* (Gmelin, 1791)

Project duration: 2024-26

Principal Investigator
N. S. Nagpure

Co-Principal Investigators
Mukunda Goswami, Rupam Sharma, Manoj P. Brahmane, Kiran D. Rasal

Microplastics (MPs) and nanoplastics (NPs) are emerging environmental contaminants of growing concern due to their potential adverse effects on aquatic organisms. Given the limited ecotoxicological data available for aquatic invertebrates, this study investigated the toxicity pathways of MPs and NPs in the forked venus clam (*Gafrarium divaricatum*, Gmelin 1791) using an integrated approach involving genotoxic, biochemical, histological, and molecular biomarkers. Acute toxicity bioassays using polyethylene microplastic (PE MP) spheres and filaments showed no mortality in G. *divaricatum*, even at the highest tested concentration of 1500 mg/L, indicating low acute lethality. To assess sub-lethal toxicological effects, clams were exposed for 96 hours and 15 days to three concentrations of PE MPs and polystyrene nanoparticles (PS NPs): T1 (0.1 mg/L, environmentally relevant concentration based on Mumbai coast data), T2 (1 mg/L), and T3 (10 mg/L). DNA damage was assessed using the comet assay, and results revealed a clear time- and concentration-dependent increase in DNA strand breaks in both gill and intestine cells. After 96 hours, % Tail DNA in gill cells followed the trend T3 (11.19%) > T2 (6.97%) > T1 (3.20%) > Control (0.40%), and a similar pattern was seen in intestine cells. At 15 days, DNA damage was more pronounced, especially in intestine cells, reaching 16.69% Tail DNA in T3. The clam micronucleus cytome (CMNcyt) assay revealed significant nuclear abnormalities, including micronuclei (MNi), nuclear buds, karyohexis, and nucleoplasmic bridges, particularly in the gill tissues at 96 hours and in the intestine tissues at 15 days in the highest exposure group (T3). Additionally, altered gene expression of *Cu-sod, cat,* and *xpd* in response to PS NP exposure indicated the activation of oxidative stress responses and DNA repair mechanisms. Histopathological analysis of gill tissues revealed distinct morphological alterations such as epithelial lifting, cell degeneration, and tissue disruption, further confirming physiological stress induced by MP and NP exposure. These findings highlight the sub-lethal but significant cellular and molecular stress responses induced by micro- and nanoplastics in marine bivalves, underscoring the ecological risk posed by plastic pollution in coastal environments.



Nuclear abnormalities in gill and intestine cells of *G. divaricatum* exposed to different concentrations of nanoplastics

3.6. Fisheries Economics, Extension & Statistics Division

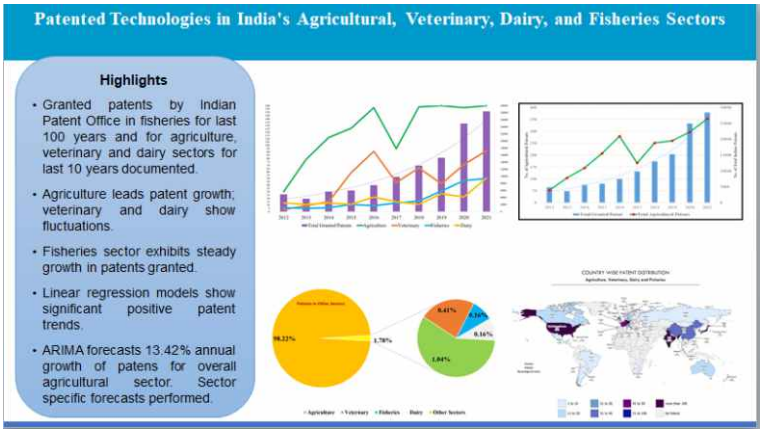
3.6.1 India's Patented Technological Innovations in Fisheries and Aquaculture

Project duration: 2022-25

Principal Investigator
Arpita Sharma

Co-Principal Investigator
Vinod K Yadav

The Indian fisheries sector has demonstrated growing engagement with various forms of intellectual property rights (IPRs)—notably patents, industrial designs, trademarks, and copyrights—as revealed through a detailed analysis using the CIFEPat search methodology, covering data from 1913 onward. This study highlights key trends and the evolving innovation landscape within the sector. In the area of patents, the majority (53.54%) were granted in fish processing technology, followed by aquaculture (33.72%) and fishing technology (12.74%). Notably, foreign applicants accounted for 51.41% of the total patents, underscoring international interest and investment in Indian fisheries innovations. However, the contribution of fisheries patents to India's overall patent portfolio remains relatively small at 0.13% over the last decade. For industrial designs, aquaculture dominated with 67.24% of registrations, followed by fish processing (24.14%) and fishing technology (8.62%). Unlike patents, Indian applicants constituted 93.10% of total design registrations, suggesting strong domestic engagement in product design. Nonetheless, fisheries-related designs contributed only 0.04% to India's total registered designs in the past decade. In terms of trademarks, 92.58% were filed by Indian applicants, reflecting robust branding activity within the country. Most trademarks (61.72%) were related to fish processing technology, with aquaculture (27.53%) and fishing technology (10.55%) following. The class distribution of registered trademarks revealed 57.03% under Class 29 (meat and fish products), 18.75% under Class 31 (agriculture/horticulture), and 8.20% under Class 22 (nets, ropes, etc.). However, fisheries trademarks represented just 0.01% of India's total over the past decade. In the copyrights domain, the fisheries sector registered the highest share in literary and dramatic works (51.52%), followed by artistic works (31.82%) and computer software (16.67%), indicating active documentation, visual content, and digital tool development. These copyrights accounted for 0.07% of the national total over the last ten years. While these contributions to the national IPR portfolio remain modest, they reflect a steady upward trajectory, particularly in patents. A broader analysis of IPR trends across agricultural, veterinary, dairy, and fisheries sectors revealed that agriculture leads in patent growth, while veterinary and dairy show fluctuations. The fisheries sector displays consistent growth, as confirmed by linear regression models and ARIMA forecasts, which project an average annual growth rate of 13.42% across the combined sectors. Sector-specific forecasts have also been conducted to support strategic planning and innovation management. To facilitate continued tracking and strategic decision-making, a dedicated IPR database for agriculture-related technologies is currently under development. This comprehensive approach underscores the potential for greater innovation and IP utilization within the fisheries sector, highlighting the need to strengthen awareness, capacity building, and targeted R&D to further enhance its contributions to India's knowledge economy.



3.7. CIFE Kolkata Centre

3.7.1 Strategies for quality fish production through species combination, environmental and nutritional interventions

Project duration: 2023-24

Principal Investigator
G. Biswas

Co-Principal Investigators
G.H. Pailan, P. Sardar, S. Sahoo, H. Mandakini Devi, D.K. Singh, Suman Manna, S. Pradhan, Leesa Priyadarsani

Technical Associate:
P.K. Behera

Comparison of muscle proximate composition, amino acid and fatty acid profiles, and mineral composition of rohu collected from four different culture systems. Rohu was selected as the representative species for assessment of its quality from different culture systems and species combinations. Rohu (300-500 g) from natural water (beel) had superior muscle amino acid and fatty acid profiles and flesh quality in terms of dressing yield and water holding capacity in comparison to the rohu from three different culture systems (freshwater semi-intensive, freshwater extensive, and brackishwater extensive) (Table 1). Muscle mineral (Mn, Cu and Se) levels were higher in rohu from brackishwater extensive system, whereas Co and Zn levels were higher in rohu from a freshwater semi-intensive system.

Table 1. Fillet quality of rohu collected from four different culture systems

Culture system	Cooking loss (%)	Dressing yield (%)	pH	Water holding capacity (%)	Flavour[1]	Taste[2]
Freshwater semi-intensive	24.96±1.13	58.66^{a}±0.30	6.86±0.01	82.26^{a}±1.10	8.00^{b}±0.01	8.07^{b}±0.17
Freshwater extensive	20.60±2.68	57.59^{a}±1.12	6.06±0.38	82.06^{a}±0.25	7.00^{a}±0.01	7.17^{a}±0.17
Natural water (Beel)	19.89±1.39	61.76^{b}±0.51	6.07±0.25	87.37^{b}±1.14	8.12^{b}±0.36	8.12^{b}±0.36
Brackishwater extensive	21.54±2.02	58.92^{a}±0.84	6.42±0.24	84.56^{a}±1.02	8.08^{b}±0.22	8.14^{b}±0.32
p-value	0.195	0.016	0.122	0.011	0.016	0.049

1,2 Based on 9-point hedonic scale; Data are expressed as mean±SE, n=10; Means bearing different superscripts in a column differ significantly (P< 0.05)

Flesh quality of rohu collected from freshwater semi-intensive and natural system (Beel) during ice storage

Comparison of flesh quality of rohu from a semi-intensive culture system and natural system (beel) during a 16-day ice storage indicated better quality fish from beel in terms of biochemical parameters, texture, sensory (freshness) attributes and organoleptic parameter

Assessment of the quality of fish in relation to species combination under polyculture system

Rohu from three-species, six species, and seven-species polyculture systems had similar proximate composition but with better fillet quality in terms of dressing yield, water holding capacity and organoleptic attribute in the three-species polyculture (Table 2)

Table 2. Fillet quality of rohu collected from three different species combinations in polyculture

Treatment[1]	Cooking loss (%)	Dressing yield (%)	pH	Water holding capacity (%)	Flavour[2]	Taste[3]
SP3	21.61^{a}±0.63	59.46^{b}±0.63	6.86±0.03	87.53^{b}±0.31	7.83±0.16	8.0^{b}±0.28
SP6	32.24^{b}±0.42	53.51^{a}±0.62	6.83±0.04	85.02^{a}±0.34	7.53±0.42	6.7^{a}±0.24
SP7	34.59^{b}±0.54	56.56^{a}±0.79	6.93±0.03	84.85^{a}±0.53	7.50±0.50	6.5^{a}±0.26
p-value	0.01	0.047	0.18	0.01	0.56	0.02

1SP3, Catla, Rohu & Mrigal; SP6, Catla, Rohu, Mrigal, Silver carp, Common carp, Grass carp; SP7, Catla, Rohu, Mrigal, Silver carp, Common carp, Grass carp & Silver barb; 2,3Based on 9-point hedonic scale

3.7.2 Evaluation of non-invasive detection methods for assessing stress response in fish (Fish Welfare part-2)

Project duration: 2023-26

Principal Investigator
Sujata Sahoo

Co-Principal Investigators
Leesa Priyadarsani, Suman Manna, D.K. Singh, G. Biswas, G. H. Pailan

The present study evaluated the effect of chronic crowding stress on fin cortisol levels in *Pangasianodon hypophthalmus* fingerlings, highlighting the utility of fin cortisol as a non-lethal, alternative biomarker for long-term stress assessment in aquaculture. Unlike blood cortisol, which offers only a momentary snapshot of stress at the time of sampling or death, fin cortisol provides an integrated measure of chronic stress, making it a more reliable indicator under prolonged rearing conditions. To investigate this, fingerlings weighing 12.02±0.47 g were randomly distributed into three groups with varying stocking densities (SD): SD1 (9 fish/100 L), SD2 (27 fish/100 L), and SD3 (45 fish/100 L). The fish were subjected to crowding stress for two months, followed by a 30-day withdrawal phase, during which SD2 and SD3 were adjusted to SD1 levels to evaluate recovery. Sampling was conducted at the end of the first and second month and then weekly during the withdrawal period. A standardized method for fin steroid extraction was established, and cortisol concentrations were measured using a commercial ELISA kit. On the 30th day, cortisol levels from various fin types—anal, caudal, pelvic, pectoral, and dorsal—were analyzed across groups. Results showed that fin cortisol levels were significantly elevated ($p<0.05$) in both SD2 and SD3 groups compared to SD1, with the pectoral fin showing the highest levels and the anal fin the lowest. This trend clearly demonstrated a dose-dependent response to stocking density stress. Importantly, following the withdrawal of crowding stress, cortisol concentrations began to decrease gradually, suggesting a potential for physiological recovery once optimal conditions were restored. Overall, this study establishes that fin cortisol is a viable, non-invasive biomarker for monitoring chronic stress in aquaculture systems. The results underscore the importance of maintaining optimal stocking densities and support the adoption of low-cost, non-lethal stress monitoring tools to enhance fish welfare and sustainable aquaculture practices.

3.7.3 Performance effectiveness and impact assessment of selected ICAR-CIFE's technologies in Eastern and North-Eastern regions of India

Project duration: 2024-27

Principal Investigator
G. H. Pailan

Co-Principal Investigators
T.K. Ghoshal, D. K. Singh, H. Mandakini Devi, S. Manna, S. Pradhan, L. Priyadarshani, Shivaji Argade

Technical Associates:
P.K. Behera, P. Das

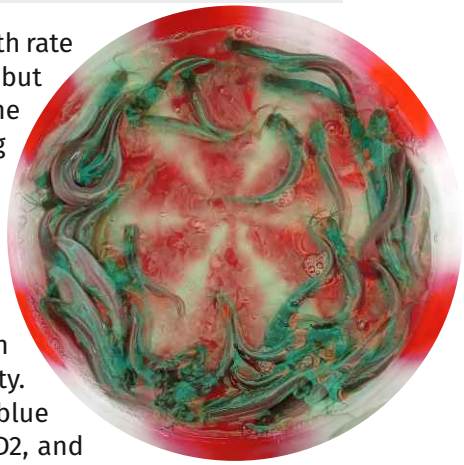
To promote sustainable aquaculture and improve livelihoods in Eastern and North-Eastern India, ICAR-CIFE Kolkata Centre implemented two major initiatives: the demonstration of water testing kits for fish farmers and entrepreneurship development through value-added fish products. Under the "Socio-economic Upliftment of Fish Farmers" initiative, ICAR-CIFE developed and introduced seven user-friendly aquaculture water testing kits, with field demonstrations focusing on pH and dissolved oxygen (DO) kits across West Bengal, Jharkhand, and Sikkim. A baseline survey involving 200 fish farmers was conducted through structured questionnaires to collect data on their pond ownership, culture species, farming practices, production levels, and profit margins. The survey revealed that most farmers lacked awareness of scientific fish farming practices, particularly regarding water quality management. Many were unfamiliar with the importance of pH and DO levels and did not monitor them regularly. In North Bengal and Jharkhand, acidic soil and water conditions were common, while in South 24-Parganas, low DO levels were frequently reported during summer, leading to poor fish growth and yield. Through field-level demonstrations using the CIFE pH and DO test kits, farmers were trained to understand and maintain optimal water quality parameters. This not only aimed at enhancing pond nutrient status and plankton availability but also sought to improve fish production, thereby contributing to better socio-economic and nutritional security for the farming families. In a parallel initiative for entrepreneurship development, demonstration-cum-training programs were organized to prepare value-added fish products to transform low-cost fish into high-value, ready-to-eat items. These sessions aimed to create awareness about the business potential of fish-based value addition, engaging 200 participants from across India. Most trainees were unaware of such products and had never been exposed to their market potential. As a follow-up, 12 promising beneficiaries were selected based on their entrepreneurial interest and demographic profiles.

3.7.4 Nutritional intervention for productivity enhancement of Asian stinging catfish (*Heteropneustes fossilis*) reared in intensified condition

Project duration: 2024-27

Principal Investigator
T.K. Ghoshal

Co-Principal Investigators
P. Sardar, G. Biswas, S. Sahoo, D.K. Singh, S. Pradhan, Leesa Priyadarsani



A 90-day feeding trial was conducted to optimize the stocking density for *Heteropneustes fossilis* (singhi) juveniles reared in cemented tanks with continuous aeration. Five stocking densities were evaluated: 50 (Sd1), 100 (SD2), 150 (SD3), 200 (SD4), and 250 (SD5) fish/m³. Fish were fed commercial pelleted catfish feed containing 38% crude protein and 6% lipid, offered to satiation three times daily. The results showed that growth parameters such as weight gain percentage (WG%) and specific growth rate (SGR) were statistically similar ($p>0.05$) among SD1, SD2, and SD3, but were significantly higher ($p<0.05$) than in SD4 and SD5. Conversely, the feed conversion ratio (FCR) followed an inverse trend, increasing significantly in SD4 and SD5, indicating poorer feed efficiency. Protein efficiency ratio (PER) was significantly lower ($p<0.05$) in SD4 and SD5, while SD1 and SD2 recorded the highest PER values, highlighting better protein utilization at lower densities. Viscerosomatic index (VSI) and hepatosomatic index (HSI) remained similar across SD1 to SD4 but were significantly elevated ($p<0.05$) in SD5, suggesting stress-related liver enlargement at the highest density. Immune response, as assessed by respiratory burst activity via nitro-blue tetrazolium (NBT) assay, was significantly higher ($p<0.05$) in SD1, SD2, and SD3 compared to SD4 and SD5, reflecting reduced immune function at higher densities. In terms of whole-body proximate composition (wet weight basis), moisture content decreased ($p<0.05$) with increasing stocking density, while lipid content increased, indicating a compensatory relationship. Crude protein content was significantly higher in SD1 to SD3 compared to SD4 and SD5, mirroring the trends in growth and feed utilization. For the indoor culture of singhi juveniles in cemented tanks, a stocking density up to 150 fish/m³ (SD3) is optimal, balancing growth, feed efficiency, immunity, and body composition. Higher densities beyond SD3 negatively affect growth performance and health, underscoring the importance of density regulation for sustainable singhi aquaculture.

Table 1. Growth performance of singhi, *Heteropneustes fossilis* juveniles

Parameters	Treatments[1]					*p*-value
	SD1	SD2	SD3	SD4	SD5	
WG[2] (%)	$132.06^{b}\pm6.37$	$128.14^{b}\pm4.51$	$119.33^{b}\pm2.94$	$72.16^{a}\pm3.50$	$76.42^{a}\pm2.63$	<0.001
SGR[3]	$0.93^{b}\pm0.03$	$0.92^{b}\pm0.02$	$0.87^{b}\pm0.02$	$0.60^{a}\pm0.02$	$0.63^{a}\pm0.02$	<0.001
FCR[4]	$1.05^{a}\pm0.04$	$1.10^{a}\pm0.04$	$1.23^{a}\pm0.04$	$2.13^{b}\pm0.08$	$2.35^{b}\pm0.13$	<0.001
PER[5]	$2.46^{c}\pm0.09$	$2.34^{c}\pm0.08$	$2.08^{b}\pm0.07$	$1.21^{a}\pm0.04$	$1.10^{a}\pm0.06$	<0.001

Mean values in the same row with different superscripts vary significantly ($p<0.05$)
1SD1, 50 fish/m3; SD2, 100 fish/m3; SD3, 150 fish/m3; SD4, 200 fish/m3; SD5, 250 fish/m3
2WG (%), Weight gain percentage; 3SGR, Specific growth rate; 4FCR, Feed conversion ratio; 5PER, Protein efficiency ratio.

3.8. CIFE Rohtak Centre

3.8.1 A study on the white faeces syndrome (WFS) in farmed *Penaeus vannamei* in inland saline areas and development of a management strategy

Project duration: 2022-25

Principal Investigator
Sreedharan K

Co-Principal Investigators
Babitha Rani A.M, Pankaj Kumar, Gayatri Tripathi, Sanath Kumar H.

Technical Associates
Ashok Kumar, Satyendar Singh

A phenotypic and molecular characterization study was conducted on 33 *Vibrio* isolates collected from White Feces Syndrome (WFS)-affected shrimp ponds in Bohar and Anwal, Haryana, to understand their virulence potential and antibiotic resistance profiles. The isolates were assessed for their hydrolytic enzyme activity—including amylase, gelatinase, lipase, and DNase production—as well as slime formation, all of which are indicators of potential pathogenicity. Notably, 14 isolates tested positive for all assays, suggesting a strong correlation with virulence factors. Molecular identification using 16S rRNA gene sequencing was performed on five selected isolates from Anwal, revealing the presence of *Aeromonas veronii* (three isolates from gut: ANW10, ANW13, ANW15) and *Vibrio* cholerae (ANW19, ANW20). These isolates were also positive for multiple hydrolytic enzymes, reaffirming their virulent nature. Furthermore, PCR screening for *Enterocytozoon hepatopenaei* (EHP) detected mild infections in three WFS-infected shrimp samples collected from Lahli, indicating a potential co-infection scenario contributing to WFS pathology. To further understand the pathogenic potential, PCR screening of virulence genes showed that six isolates were positive for *toxR*, *tlh*, and *trh* genes commonly associated with toxigenic *Vibrio* spp. Finally, antibiotic susceptibility testing revealed that all selected isolates exhibited Multiple Antibiotic Resistance (MAR), with MAR index values ranging from 0.32 to 0.64, indicating a high level of resistance and significant risk to aquaculture health management. These findings underscore the need for continuous monitoring and the development of targeted biosecurity measures and responsible antibiotic use in shrimp farming systems affected by WFS.

3.9. CIFE Powarkheda Centre

3.9.1 Evaluation of suitable common carp (*Cyprinus carpio*) with suitable plants for sub-tropical climatic conditions in Aquaponic system

Project duration: 2024-25

Principal Investigator
Harsha Haridas

Co-Principal Investigators
A.K. Verma, S.K. Nayak, Dhalongsaih Reang, Debajit Sarma, Shashi Bhushan

Technical Associate
Hasan Javed

An experiment was conducted at the Powarkheda Research Centre (Madhya Pradesh) to optimize the nutrient levels and stocking density of strawberry plants in a flood-and-drain aquaponics system integrated with common carp culture. The study utilized 18 identical aquaponic units, each comprising a fish culture tank, a gravel-bed hydroponic unit, a submersible water pump, and an aeration setup. The water was pumped from the fish tank to the hydroponic grow bed and returned via a bell siphon system, creating a flood and drain condition in the grow bed, with a hydraulic loading rate of 3.0 m/day maintained throughout the study. Each fish culture tank was a 90 L plastic round tub with an effective volume of 50 L. The hydroponic component consisted of halved HDPE barrels (0.90 × 0.50 × 0.21 m) filled with 20–25 mm gravel. Borewell water was used for initial filling, and the system underwent a seven-day fishless cycling period to allow the development of beneficial nitrifying bacteria. Common carp seeds with an average weight of 0.5 g and a length of 4 cm were stocked at two levels of fish density, and three plant densities were tested in a 2×3 factorial design. Water quality parameters remained within optimal limits for fish culture throughout the experiment, confirming system sustainability. Based on the outcomes, a fish stocking density of 6 fish per 10 L and 6 plants per 0.45 m^2 was identified as the optimal configuration for this flood-and-drain aquaponics system. However, during the trial, signs of nutrient deficiencies were observed in the strawberry plants and fruits, indicating limitations in nutrient availability within the system. To address this, a follow-up experiment has been designed to optimize the nutrient supplementation, focusing on key elements—Potassium (K), Phosphorus (P), and Calcium (Ca)—and their various combinations. This second phase aims to enhance plant nutrient uptake and yield, further improving the viability and productivity of integrated aquaponic systems for diversified agri-aquaculture applications.

3.9.2 Designing optimum cohort breeding programme for mass selection of IMCs

Project duration: 2022-25

Principal Investigator
Sunil Kumar Nayak

Co-Principal Investigators
Shrinivas Jahageerdar, M.A.Pathan, D. Reang, A.Lenin Singh, H.haridas, A.Sharma, Tincy Varghese, Shashi Bhushan

Technical Associate
Hasan Javed

Six geographical stocks of Rohu, viz., stock 1 to 6 were cultured in earthen ponds. Growth-related traits, viz., Body Weight (BW) and Total Length (TL), were recorded monthly wise for 390 days of pond age. The phenotypic selection for body weight was performed. The threshold BW for each stock at 390 days of pond age for stock 5, stock 1, stock 2, stock 3, stock 4, and stock 6 was 553.84g, 549.94g, 465.32g, 353.62g, 419.10g, and 329.21g respectively and the number of fish selected from the stocks are as well 78, 96, 60, 76, 50 and 85. After phenotypic selection, three cohorts comprising 37 families were produced using 74 males and 148 females. Further, the performance for early growth traits viz., BW1, BW2, TL1 and TL2 was 0.63 ± 0.01g, 1.88 ± 0.03g, 3.29 ± 0.02cm and 5.47 ± 0.04cm respectively. A moderate to high heritability estimates for BW2 (0.35 ± 0.07) and TL2 (0.49 ± 0.09) were obtained in the present study that suggest a significant genetic variation which can be utilized in cohort breeding programs.

3.10. CIFE Kakinada Centre

3.10.1 Valorization of Fruit and Vegetable Waste for Aquafeed

Project duration: 2022-25

Principal Investigator
Shamna N

Co-Principal Investigators
Parimal Sardar, Manish Jayant, Subodh Gupta, Manjusha L., Babitha Rani, Jeena K., Namrata A. Giri

The sixth experiment from this project explored the potential of agro-waste biomass as a cost-effective feed alternative by incorporating Green Pea Pod Meal (GPM) in carp diets. Two strategies—exogenous enzyme supplementation (cellulase & xylanase at 0.1%) and solid-state fermentation (SSF) with *Aspergillus niger*—were applied to enhance GPM's nutritional value. SSF improved crude protein and digestibility while reducing crude fiber and anti-nutritional factors.

A 60-day feeding trial with 315 *Labeo rohita* fingerlings (8.00 ± 0.21g) assessed growth, nutrient utilization, and enzyme activity. Diets (30% CP, 371 kcal/100g) included GPM at 15% and 30% in three forms: raw (GPM15, GPM30), enzyme supplemented (GPM15+EE, GPM30+EE), and fermented (FGPM15, FGPM30). Growth performance, protein efficiency, and nutrient utilization were significantly higher ($p<0.05$) in FGPM groups, followed by enzyme-supplemented diets, while feed conversion ratios were lower. Amylase and protease activities were elevated in fermented and enzyme-treated groups, whereas hepatic antioxidant enzyme activity was higher in GPM30-fed fish.

The study concludes that raw GPM can be included at up to 15%, but fermentation (15–30%) or enzyme supplementation enhances growth and nutrient utilization in *L. rohita* fingerlings.

3.10.2 Optimization of stocking density and feeding strategies in brackishwater polyculture models for enhanced production

Project duration: 2024-27

Principal Investigator
Muralidhar P. Ande

Co-Principal Investigators
Karthireddy Syamala, Shamna N, Gouranga Biswas

Technical Associates:
M. Usha Rani

This project examined the feasibility of utilizing agro-waste biomass as a sustainable and cost-effective feed alternative for Mugil cephalus. The digestibility of palm kernel meal (PKM) was evaluated using the method described by Ali et al. (2009). The enzymes were extracted from the alimentary canal of M. cephalus and incubated with PKM at 37° C for 12 h. The drop in pH was recorded over 10 min, with casein as the reference protein. Relative Protein Digestibility (RPD %) = (ΔpH of ingredients / ΔpH of casein) x 100

The IVRPD of PKM was determined to be 71.56%, indicating moderate digestibility in M. cephalus.

The formulated diets incorporated diverse protein sources, including soybean meal, groundnut oil cake (GNOC), de-oiled rice bran (DORB), insect meal, algal meal (Chlorella), and palm kernel meal (PKM), with targeted supplementation of taurine and betaine at varying concentrations.

A 60-day feeding trial was conducted using *M. cephalus* to evaluate growth performance, feed utilization, and nutrient assimilation. The experimental diets were formulated with 30% soybean meal, 20% GNOC, and varying levels of DORB, insect meal (IM), algal meal (AM), and PKM. Two functional additives—taurine (0.5% and 1%) and betaine (0.5% and 1%)—were tested to enhance feed palatability and digestion. The feeding trial is ongoing, with regular monitoring of growth and feed intake. Growth performance, nutrient utilization efficiency, and physio-metabolic enzyme analysis will be performed at the end of the experiment.

3.11. CIFE Motipur Centre

3.11.1 Screening and evaluation of species specific feeding stimulants and attractants for aquaculture

Project duration: 2022-25

Principal Investigator
MD Aklakur

Co-Principal Investigators
Ashutosh D Deo,
Udipta Roy

The project focused on evaluating species-specific responses to a range of attractants, additives, and minor ingredients in aquafeed formulations, aiming to enhance feed intake, nutrient utilization, and cost-effective aquaculture production. A diverse group of cultured species—Catla, Rohu, Mrigal, Common carp, Silver carp, Grass carp, Singhi, Anabas, and Pacific white shrimp (*Penaeus vannamei*) - were included in the trials to assess how each responded to a broad spectrum of feed components. These included natural ingredients such as floc meal, black soldier fly (BSF) meal, shrimp head meal, gastropod meal, fish hydrolysate, papain digest, detritus meal, spirulina meal, mixed algal meal, squid liver meal, and yeast ferment, along with synthetic attractants and amino acids like lysine, methionine, arginine, glutamic acid, DMPT, citric acid, glucose, betaine, taurine, hydroxyproline, alanine, glycine, and TMA (trimethylamine). The comprehensive screening revealed that many of these minor ingredients and attractants significantly improved feed palatability, stimulated higher feed intake, and led to better nutrient absorption, ultimately contributing to reduced feed waste, enhanced growth, and improved physiological and health parameters in the target species. Notably, responses varied among species, reinforcing the importance of customized feed formulations that cater to the specific feeding behavior and nutritional requirements of each species. These findings provide a valuable foundation for the formulation of precision aquafeeds, supporting the development of more sustainable and efficient aquaculture practices. The integration of both natural and synthetic attractants offers a balanced, cost-effective approach to improving feed utilization and minimizing environmental impact. By addressing species-specific feeding preferences and digestive capabilities, the study contributes critical insights toward next-generation aquafeed development, aligning with industry priorities for economic viability, resource efficiency, and environmental sustainability in modern aquaculture systems.

External Funded Projects

3.1.6. Technology demonstration of emerging fish species in biofloc culture system

Project duration: 2022-2024

Principal Investigator:
Babitha Rani A. M

Co-Principal Investigators:
Shamna, N., Sreedharan, K., Upasana Sahoo

Budget
Rs. 26.0 Lakhs

Funding agency
National Fisheries Development Board

The ready-to-use media for freshwater biofloc production was successfully standardized, and the ex-situ developed biofloc was evaluated as a ready-to-use medium for biofloc culture in fish. The characteristics of the floc-forming process were thoroughly assessed, and it was found that the biofloc starter media had the ability to produce biofloc in a significantly short period of time. This indicates the media's efficiency and potential for use in large-scale aquaculture systems. Water quality parameters were also carefully monitored, revealing that the toxic metabolites were consistently within the acceptable limits for a zero-water discharge system, ensuring that the rearing environment remained safe for fish growth. For the rearing trials, six biofloc units, each with a capacity of 15,000 liters, were stocked with Singhi fish (*Heteropneustes fossilis*), at stocking densities of 120 and 160 fish per square meter. These trials were conducted in triplicates to ensure the reliability of the results. The fish showed promising growth, with an average weight of 56 grams and the highest recorded weight reaching 90 grams. This outcome demonstrates the effectiveness of biofloc technology in promoting optimal fish growth under controlled conditions. Additionally, the dietary protein requirement and stocking density for Climbing perch (*Anabas testudineus*) in the biofloc culture system were standardized, with a protein requirement of 30% and a stocking density of 150 fish per cubic meter (150/m^3). Fish seeds with an average weight of 0.5 grams were stocked at a density of 150 fish/m^3 in four tanks, each with a 15,000 L capacity, to further study the efficacy of the biofloc system for this species. To promote the adoption of this technology, training, and demonstration sessions were held for entrepreneurs in two batches. These sessions focused on standard operating protocols for rearing emerging species in biofloc systems. A total of 29 individuals, including entrepreneurs and aquaculture professionals, were trained, equipping them with the necessary knowledge and skills to implement biofloc technology in their farming practices.

3.1.7 Environmental and nutritional intervention to farm white leg shrimp, *Penaeus vannamei* in low saline water (LSW): a strategy for improving aquaculture production

Project duration: 2023-2027

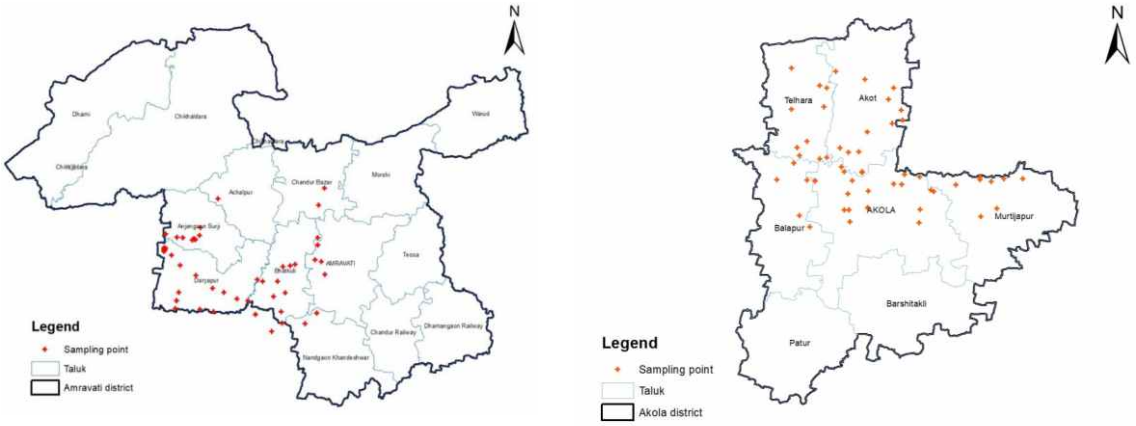
Principal Investigator:
Sukham Munilkumar

Co-Principal Investigators:
Prem Kumar , T.I.Chanu

Budget
Rs. 50.39 Lakhs

Funding agency
ICAR-NASF

In the Indian subcontinent, inland saline groundwater typically exhibits variations in ionic concentrations, which can significantly impact the survival and growth of various fish and shellfish species. Therefore, utilizing these unproductive inland saline resources for aquaculture could play a crucial role in reducing the reliance on freshwater resources, contributing to sustainable farming practices. Geographic Information System (GIS) mapping was specifically conducted in the Amravati and Akola districts in the Vidarbha region of Maharashtra. A total of 54 water samples from Amravati and 56 from Akola were analyzed for various physico-chemical and ionic compositions. The salinity levels in Amravati and Akola ranged from 0.3 to 9.25 g/L and 0.28 to 10.27 g/L, respectively. Additionally, 20 water samples from three talukas (Shegaon – 7, Sangrampur – 6, and Jalgaon – 7 samples) in the Buldhana district, as well as 11 samples from Satara district (including 3 soil samples), were also analyzed. The results showed that most samples from Akola were suitable for the cultivation of Penaeus vannamei, which can tolerate salinity ranges from 0.5 to 45 ppt. However, some samples may require adjustments to prevent stress in cultured species. Remote sensing data from Sentinel-2 satellite imagery further helped



delineate these areas. In addition to GIS mapping and water quality analysis, bioassay experiments were conducted to assess the survival of Penaeus vannamei under various treatments. The results showed higher survival rates in the control group (seawater and potassium-treated groups). Significant differences were observed between the control and treatment groups, suggesting improved stress management in potassium-treated shrimp. In conclusion, GIS mapping and water sample analysis from the Amravati and Akola districts indicate that the identified lands and water quality parameters could support sustainable aquaculture development in the region. However, the variability in salinity across different areas suggests that there is significant potential for the diversification of aquaculture species. Ionic manipulation, particularly potassium supplementation, plays a critical role in addressing deficiencies in water quality and enhancing aquaculture productivity.

3.1.8 Sensor Based Vertical Farming in Horticultural Crops and Aquaponic System Development for Fisheries

Project duration: 2023-2026

Principal Investigator:
A.K. Verma

Co-Principal Investigators:
Prem Kumar and Tincy Varghese

Budget
Rs. 38.70 Lakhs

Funding agency
ICAR-NASF

The hydroponic/soilless and recirculating aquaponic-based vertical farming system was designed and developed to optimize plant and fish production. The system was evaluated for its ability to maintain water quality, promote lettuce nutrient content, and ensure the welfare of fish. Vermicompost extract was found to be particularly effective, outperforming other supplements in achieving desirable outcomes in all these parameters. A vermicompost dose of 27.5 mg/L was identified as the optimal compromise, ensuring the overall system's efficacy. This dose contributed to enhanced plant growth and fish welfare, improving water quality and nutrient content in lettuce. Additionally, a Hydraulic Loading Rate (HLR) of 5.6 m/day with the vermicompost supplement (27.5 mg/L) was recommended as the best balance for optimal performance in the Channa striata-lettuce aquaponic system. Further, based on a quadratic regression model, an optimal dose of 30.20 mg/L of cow manure extract was recommended for optimal growth of pak choi and Murrel in aquaponics. The ongoing research focuses on evaluating the impact of different seaweed extract supplements on the growth performance and physiological responses of Channa striata (Bloch, 1793) and mint (Mentha arvensis) in aquaponics, with assessments being conducted over a 120-day period. This research aims to refine and enhance the aquaponic system for sustainable agricultural practices.

3.1.9 All India Network project on Ornamental Fish Breeding and Culture : Technology development on captive breeding and seed production of selected indigenous ornamental fishes native to North Eastern Hill region and Western Ghats

Project duration: 2023-2027

Principal Investigator:
Paramita Banerjee Sawant

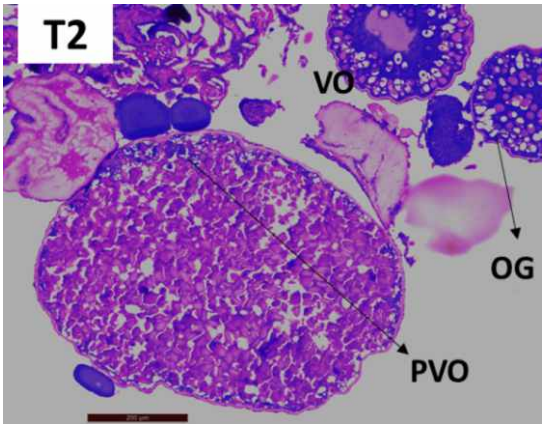
Co-Principal Investigators:
Debajit Sarma , Gouranga Biswas, Udipta Roy

Budget
Rs. 37 Lakhs

Funding agency
ICAR

Elucidating Ploidy Level Variations in Life History Traits of Zebra Loach (*Botia striata*):

Efforts to segregate reproductively active populations of the endangered zebra loach (Botia striata) from wild and captive stocks have focused on distinguishing sterile tetraploids from fertile diploids using karyotyping. In total, 150 chromosome spreads from the zebra loach were analyzed and categorized into metacentric, submetacentric, subtelocentric, and telocentric chromosomes. The karyotypic analysis identified 54 chromosomes with metacentric, submetacentric, subtelocentric, and telocentric configurations. Further ongoing analysis includes examining the relative length of chromosomes, centromeric formula, centromeric index, and total chromatin length. This detailed karyotypic data will be crucial for determining the ploidy status of both wild and captive zebra loach populations, enabling the identification and culling of sterile tetraploids from breeding groups and the retention of fertile diploids for breeding pairs.



Optimization of Feeding for Improved Gonadal Augmentation and Breeding of the Indigenous Golden Killifish (*Aplocheilus lineatus*):

A study was conducted to assess the impact of different feeding formats—extruded pellets, flakes, and commercial pellets—on the maturation of golden killifish (Aplocheilus lineatus) in captivity. Among the various treatments, fishes fed amorphous flakes (CIFEFLAK) exhibited the highest somatic growth and gonadal maturation. This superior performance can be attributed to the natural feeding behavior and gape size of A. lineatus, which primarily feeds at the water surface. The larger surface area and enhanced palatability of the flake format contributed to increased feed intake. Additionally, the efficient protein digestion and reduction in oxidative stress observed in these fish suggest that this feeding regime helped alleviate physiological stress. Reproductive assessments showed higher gonadosomatic index (GSI), advanced oocyte maturation stages, and a larger number of spermatids in fishes fed with the flake formulation, further validating its effectiveness in promoting reproductive success. Scanning electron microscopy (SEM) at 1000x magnification revealed significant differences in the structural integrity of the feed types. The cohesiveness and surface area of the CIFEFLAK format allowed it to

float longer, making it more accessible to surface-feeding species like the golden killifish, which has a large gape, leading to higher feed acceptability.

Maturation Studies on High Fin Barb (*Oreichthys crenuchoides*):

A study was conducted to evaluate the effects of the flavonoid compound, Quercetin, on the growth and maturation of the highfin barb (Oreichthys crenuchoides) in captivity. Results indicated that a dose of 10 mg/kg was optimal for promoting adequate maturation in the highfin barb. Broodstock development is currently underway at the Kolkata center for the first round of breeding. This research suggests that the use of Quercetin could be a promising strategy for enhancing growth and gonadal maturation in ornamental fish, particularly in the highfin barb, O. *crenuchoides*. The findings may lead to the development of captive seed production and commercialization for this species.

3.1.10 Investigations on ecological status, conservation, and enhancement of fisheries in Maharashtra part of Sardar Sarovar Reservoir

Project duration: 2024-2025

Principal Investigators:
Sukham Munilkumar, Arpita Sharma, A.K. Jaiswar

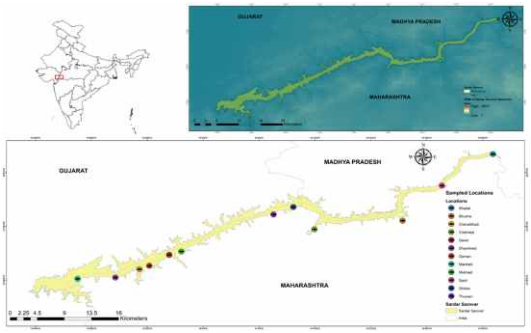
Co-Principal Investigators:
Kapil Sukhdhane, Karan Kumar Ramteke

Budget
Rs. 117 Lakhs

Funding agency
Department of Fisheries , Government of Maharashtra

The study evaluated the ecological status, conservation strategies, and fisheries development in the Maharashtra section of the Sardar Sarovar Reservoir (SSR), covering 6,000 hectares across 33 villages. The research aimed to enhance sustainable fisheries management by assessing habitat quality, fish diversity, and socio-economic factors. Monthly water quality monitoring at 12 sites showed rising air and water temperatures, promoting phytoplankton blooms, with transparency decreasing due to reduced water influx. Nutrient analysis indicated low nitrate, nitrite, and ammonia levels, but high phosphate concentrations during summer, contributing to algal growth. Chlorophyll-a levels suggested moderate primary productivity.

Heavy metal contamination in water, sediment, and fish samples was analyzed. Plankton studies identified 32 phytoplankton species and 17 zooplankton species. Fish diversity assessments recorded 33 species, and DNA barcoding confirmed 25 sequences. Trophic modeling supplemented by experimental fishing with gill nets revealed allometric growth patterns in smaller species. Fish reproductive biology, including fecundity and gonadosomatic index, was assessed. Socio-economic surveys of 40 fishers revealed an agrarian community engaged in agriculture, livestock farming, and fish processing. Cage culture profitability, with 470 cages managed by 16 cooperatives, showed a benefit-cost ratio (BCR) ranging from 0.97 to 1.2. The highest score was achieved by Narmada Navnirman Baba Gufanyadev Machhimar Sahkari Sanstha (NNBGMSS) (0.81). Livelihood assessments indicated that agrarian communities benefited from government-supported cage culture, improving income and human



capital. Interviews and focus group discussions revealed that households relied on rain-fed agriculture and capture fisheries. Women played a key role in fish processing and marketing. Some households benefited from government schemes, with transport via boats and bikes. Health services were available through biweekly boat dispensaries. Women actively participated in drag net fishing, catching small indigenous fish for household use and local markets.

3.1.11 To study the effect of application of AQUALAABH on growth and production performance of *Peneaus vannamei* and fin fishes in Inland Saline waters

Project duration: 2024-2025

Principal Investigator:
Debajit Sarma

Co-Principal Investigator:
Kapil Sukhdhane

Budget
Rs. 5.9 Lakhs

Funding agency
Agrocel Industries Pvt. Ltd., Gujarat

The experiment aimed to evaluate the effects of Aqua-labh treatments on shrimp growth performance, survivability, and proximate composition under different conditions. Various parameters, including shrimp length, weight, specific growth rate (SGR), survival percentage, and water quality factors like dissolved oxygen (DO), temperature, salinity, total dissolved solids (TDS), and mineral concentrations, were analyzed. Initial sampling showed no significant differences in shrimp length or weight across treatments, with all shrimp at similar developmental stages. However, final sampling revealed significant differences in length and weight, with treatments T2 and T8 showing the highest growth, significantly surpassing the control group (T0). These results highlight the role of mineral supplementation, particularly calcium and potassium, in promoting shrimp growth. Survivability also varied significantly among treatments, with T2 exhibiting the highest survival rate (93.33%), followed by T3 and T8. The control group had the lowest survival rate at 65%. Higher survival rates in the mineral-supplemented groups indicate the positive effects of minerals on shrimp health, with calcium, potassium, and sodium playing crucial roles in exoskeleton formation, osmoregulation, and metabolic processes. The correlation analysis further supported this, showing a strong relationship between survival and mineral concentrations. Proximate composition analysis revealed no significant differences in moisture content, crude protein, or crude fat across treatments. However, ash content showed a highly significant difference, with T2 and T5 having the highest ash content, likely due to greater mineral retention. Significant variations in mineral composition were observed, with T2 recording the highest calcium content (22.54 g/kg) and T7 having the highest potassium content (8.12 g/kg). These variations were closely linked to the growth and survival results.

Water quality parameters such as DO, temperature, salinity, and TDS were closely monitored, revealing positive correlations between higher DO levels and better growth. Stable temperatures and slight increases in salinity in treatments like T2 and T5 enhanced shrimp growth and survival, indicating that these environmental factors play important roles in shrimp physiology. TDS levels were also higher in these treatments, correlating with improved performance. Overall, Aqua-labh treatments with higher mineral content significantly outperformed the control group, confirming the importance of mineral supplementation in aquaculture. The findings suggest that integrating mineral enrichment strategies can enhance shrimp farming, leading to better growth, survival, and nutrient retention.

3.2.5 Study on the occurrence, impact on biotic communities and development of integrated technologies for remediation of the emerging pollutant Triclosan

Project duration: 2022-25

Principal Investigator:
Kundan Kumar

Co-Principal Investigators:
S.P. Shukla, Saurav Kumar

Budget
Rs. 63.64 Lakhs

Funding agency
DST, New Delhi

Triclosan (TCS), chemically known as 5-chloro-2-(2,4-dichlorophenoxy)phenol, is a broad-spectrum antimicrobial agent widely used in personal care products, veterinary applications, industrial products, and household goods. Due to its incomplete removal during wastewater treatment processes, TCS is frequently detected in aquatic ecosystems. There are concerns regarding its potential endocrine-disrupting effects and its antimicrobial properties. Additionally, studies suggest that TCS is toxic to aquatic organisms, including algae, invertebrates, and fish species. Two methods are employed to remove TCS from aquatic environments. The first involves the use of sugarcane bagasse biochar (SBB) in the presence of humic acid. Batch studies showed that SBB prepared at 400°C (Fig. 1) exhibited the highest adsorption capacity. The Langmuir isotherm model indicated maximum adsorption of 68.49 mg g^{-1} at pH 7.0, achieving 90% TCS removal at a concentration of 0.625 g L^{-1}. Adsorption followed the pseudo-second-order model, indicating chemisorption. In continuous-flow column experiments, 99% TCS removal was achieved at a concentration of 100 mg L^{-1} and a flow rate of 50 mL min^{-1}. The adsorption and breakthrough behaviors were described by the Langmuir isotherm, Thomas, and Yoon-Nelson models. The second method involves a biofilm-based ceramic adsorbent, where a biofilm is developed on the ceramic adsorbent surface. The biofilm assay demonstrated that the microbes present in the wastewater could form biofilms on the adsorbent surface. TCS removal was studied at concentrations of 5 mg L^{-1}, 10 mg L^{-1}, 20 mg L^{-1}, and 40 mg L^{-1}. The maximum removal was observed at a concentration of 5 mg L^{-1}, where 94.19% of TCS was removed within 3 hours. The biofilm-adsorbent system demonstrated rapid and effective TCS removal across various concentrations. At an initial concentration of 5 mg L^{-1}, 94.19% removal occurred within 3 hours, with complete (100%) elimination achieved within 6 hours. At 10 mg L^{-1}, removal rates were 70.20% in 3 hours, 97.15% in 6 hours, and 100% in 9 hours. For 20 mg L^{-1}, 63.16% was removed in 3 hours, 85.59% in 6 hours, and 99.94% by 12 hours, reaching 100% at 24 hours. At the highest concentration (40 mg L^{-1}), 29.45% was removed in 3 hours, 42.94% in 6 hours, and 77.75% by 12 hours, with 90.59% removal achieved by 24 hours. In contrast, control treatments showed significantly lower efficiencies, with maximum removal rates of 20.21%, 7.78%, 19.64%, and 13.35% for 5, 10, 20, and 40 mg L^{-1}, respectively, after 24 hours.

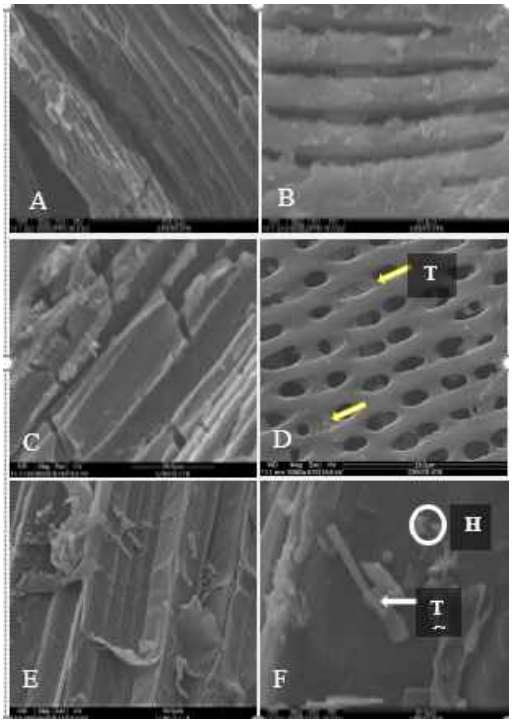


Fig.: SEM micrographs of Sugarcane Bagasse Biochar prepared at 400°C and used for developing column bed adsorbent for removal of triclosan from aqueous solution

3.2.6 Referral Laboratory under the National Surveillance Programme for Aquatic Animal Diseases

Project duration: 2022-25

Principal Investigator:
Megha Kadam Bedekar

Co-Principal Investigator:
Jeena K.

Budget
Rs. 10.00 Lakhs

Funding agency
Ministry of Fisheries, Animal Husbandry and Dairying (MFAH & D) Govt. of India

The ICAR-CIFE Referral Laboratory successfully passed proficiency testing in the molecular detection of OIE-listed shrimp and fish pathogens and received ISO/IEC 17025:2017 NABL accreditation for testing 10 aquatic animal pathogens. During the reporting period, targeted screening was conducted for emerging pathogens, including Tilapia Parvo Virus (TiPV), Infectious Spleen and Kidney Necrosis Virus (ISKNV), Cyprinid Herpesvirus 2 (CyHV 2), Carp Edema Virus (CEV), and Koi Rana Virus (KiRV). Screening for TiPV revealed a 41% prevalence of asymptomatic TiPV spread in selected farms in Maharashtra, raising concerns about its potential spread. Biosecurity advisories were issued for ISKNV, which showed widespread prevalence in Angel Fish (38.71%), Zebra Fish (28%), and Koi Carp (18.34%), with Zebra Fish identified as a novel host for this pathogen. The prevalence of CyHV 2 was 4.54% in Gold Fish and 6.06% in Koi Carp, with an overall prevalence of 10.6% during the monsoon season. Carp Edema Virus (CEV) was detected in Koi Carp at a prevalence of 0.89% during the summer season. KiRV prevalence was observed at 3.57% in the summer and 18.18% during the monsoon. Pathogen screening samples were collected from retail ornamental fish markets in Kurla, Borivali, and Navi Mumbai in Maharashtra, Ponneri and Kolathur in Tamil Nadu, and West Bengal. In shrimp farms in Maharashtra, incidences of slow growth, white spot disease, and white fecal diseases were recorded, although no cases of Infectious Myonecrosis Virus (IMNV) were reported during the year. The referral laboratory also serves as the focal point for screening imported fish and shellfish samples submitted by the Animal Quarantine and Certification Services, Government of India, Navi Mumbai, to detect OIE-listed pathogens.

Haemorrhage on gills; gill erosion

3.2.7 Application of CRISPR/Cas system in molecular detection of fish and shrimp diseases

Project duration: 2022-2025

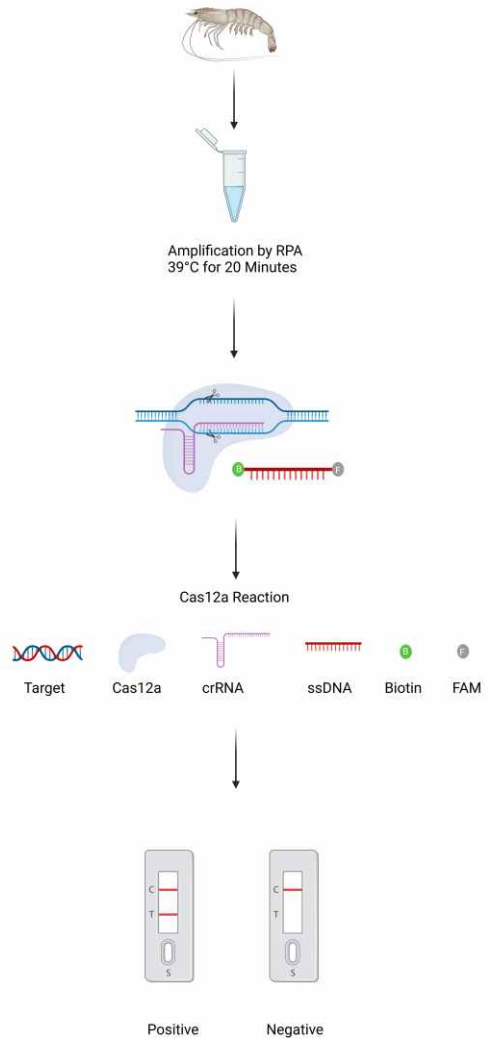
Principal Investigator:
Megha Kadam Bedekar

Co-Principal Investigators:
Rajendran KV, Jeena K, Kundan Kumar, Kiran Rasal

Budget
Rs. 19.29 Lakhs

Funding agency
ICAR consortia research platform for vaccine and diagnostics

The objectives of this project are to develop CRISPR-based diagnostic systems for detecting pathogens, specifically White Spot Syndrome Virus (WSSV) and Tilapia Lake Virus (TiLV). The project aims to create highly sensitive CRISPR-based diagnostic tests during the reporting period. ICAR-CIFE and IARI have jointly employed a CRISPR-based approach to target these two significant pathogens—WSSV and TiLV—and have developed the CIFE-SPOT and CIFE-TiLV-CRISPR tests. The WSSV test targets the VP28 and ORF 366 fragments of the virus, capable of detecting as few as 10 copies of the virus. The ORF 366 fragment is particularly useful in detecting asymptomatic infections of WSSV and has identified early infections in fry, shrimp larvae, and water successfully. The TiLV test targets segment six, the most conserved region of the virus among Indian strains, and can detect fewer than 20 copies of the virus. This test has been adapted into a point-of-care diagnostic format, using a lateral flow assay. The developed RPA-CRISPR/Cas12a platform demonstrates heightened diagnostic sensitivity, successfully detecting these viral pathogens even at very low concentrations. It also exhibits absolute target specificity, minimizing the risk of false positives. The isothermal nature of the assay enables rapid diagnostics within 1-2 hours, eliminating the need for complex temperature control equipment. Both tests are currently under patent applications (No. 202421013419 and 202321051170) and are undergoing field validation.



CRISPR-Casl 2a Virus Lateral Flow Assay based Detection

3.2.8 All India Network Project on Fish Health

Project duration:
Till December 2026

Principal Investigator:
Megha Kadam Bedekar

Co-Principal Investigators:
Swadesh Prakash Tiwari, Arun Sharma, Saurav Kumar

Budget
Rs. 12.01 lakhs

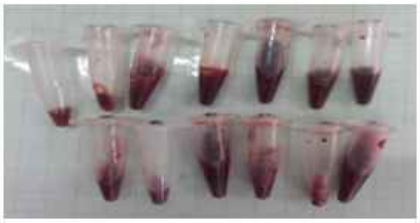
Funding agency
ICAR

The study aims to evaluate the withdrawal period, biosafety, and efficacy of Ivermectin in *Cyprinus carpio*. The pharmacokinetics of Ivermectin administered through feed in *Cyprinus carpio* have been evaluated. The LD50 value for Ivermectin in *Cyprinus carpio* was determined to be 9.34 mg/kg body weight, indicating high toxicity at elevated concentrations. Fish administered higher doses exhibited several behavioral changes, including loss of equilibrium, erratic swimming, mucus secretion, and hypoxia. Hematological findings revealed significant changes in red blood cell (RBC) count, hemoglobin levels, and mean corpuscular hemoglobin concentration (MCHC) in treated fish compared to control groups. Gene expression analysis showed a dose-dependent increase in HSP 70 gene expression in liver tissue. The expression of HSP 70 remained elevated for several days post-treatment, indicating a stress response to Ivermectin exposure. The study on the withdrawal period of ivermectin is still ongoing.

In addition, surveys were conducted in aquaculture fish and shrimp farm areas across Maharashtra, Gujarat, Andhra Pradesh, Telangana, and Haryana to assess the economic impact of aquatic animal diseases. Information regarding farming practices was collected during these surveys. A sensitization workshop on fish health management was organized on December 30, 2024, and it was attended by 74 fish farmers, Fisheries Development Officers, and Sargar Mitras.

Different concentrations of IVM-coated feed

Dissected experimental fish (common carp)



Collected blood samples from *C. carpio* after administration of IVM

Healthy experimental animal (common carp)

Experimental set up for determination of Biosafety under AINPFH project

Diseased common carp

3.2.9 Toxicological studies of consortia of pure culture microbial formulation applied in waste treatment in component of freshwater ecosystem like algal, cyanobacteria, daphnia and fish model

Project duration: 2024-2025

Principal Investigator:
S.P. Shukla

Co-Principal Investigators:
Munilkumar Sukham, Kundan Kumar, Saurav Kumar

Budget
Rs. 5.93 lakhs

Funding agency
Bioxgreen Private Limited, Chennai

Bioxgreen is a biotech company that produces a proprietary and innovative blend of products and solutions for the management of waste from municipal, agricultural, home, and environmental sources. The company manufactures bio-culture products for applications in bioremediation, wastewater treatment, and solid waste management projects. These bio-cultures are eco-friendly and biodegradable. The current project aims to evaluate the toxicological effects of BXGE on various components of the freshwater aquatic ecosystem (Fig. 1). Four standard bioassay tests were performed to evaluate the toxicological effects of BXGE on different biotic components of the ecosystem: (i) growth inhibition test on freshwater algae and cyanobacteria, (ii) fish acute toxicity test, (iii) toxicity studies on freshwater *Daphnia magna* reproduction, and (iv) toxicity studies on early life stages of fish. The findings highlighted differential responses in growth and pigment synthesis between *Chlorella vulgaris* and *Spirulina platensis* under various concentrations of the test chemical. *Chlorella vulgaris* exhibited enhanced pigment synthesis and growth at moderate concentrations, while *Spirulina platensis* displayed growth inhibition at higher chemical levels. There were no significant changes in vital water quality parameters during exposure to the Bioxgreen pure culture microbial formulation. Fish (Tilapia and Pangasius) did not exhibit significant mortality during 96 hours of exposure in the 1-5 ppm range. At five times the application dose, more than 95% survival was observed in the exposed fish. The mean number of living offspring produced by *D. magna* per parent animal in the control and up to 3 ppm was ≥ 60 at the end of the test. Overall, the BXGE microbial formulation at an application dose of 1 ppm was found to be non-toxic to freshwater algae, cyanobacteria, *Daphnia magna*, and early-stage fish.

Fig. 1: Model organism used for the toxicological studies of consortia of pure culture microbial formulation applied in waste treatment in component

3.2.10 A study on the algal biomass based aqua feed on fish growth and immunological properties

Project duration: 2024-2025

Principal Investigator:
S.P. Shukla

Co-Principal Investigators:
Kundan Kumar, Saurav Kumar, Manish Jayant

Budget
Rs. 16.25 lakhs

Funding agency
Reliance Industries Ltd

Reliance Industries Limited (RIL) is one of India's largest and most diversified conglomerates, with interests spanning petrochemicals, refining, oil and gas exploration, telecommunications, retail, and digital services. In addition to its established sectors, RIL has also ventured into the areas of fisheries and livestock, focusing on sustainable and technologically advanced solutions. Through its initiatives, the company aims to enhance the productivity and welfare of the agriculture and animal husbandry sectors. This includes providing high-quality fish feeds, aquaculture solutions, and livestock care products, ensuring better yields and supporting farmers and fishermen. RIL's integrated approach brings modern technology and innovation to these traditional industries, contributing to food security and rural development across India.

The present project is to evaluate the algal biomass-based aqua feed on fish growth and immunological properties. Fishes were procured from Raigad, Maharashtra, and acclimatized for a period of 21 days in large circular tanks. During this acclimatization phase, optimum rearing conditions and water parameters were maintained. After the 21-day acclimatization period, the fish were transferred into crates with a capacity of 160 liters, each holding approximately 90 liters of water. Each crate contained 20 fishes. A total of six sets of crates were prepared, with each set arranged in triplicate. Out of these, two sets were designated as control groups, while the remaining four sets were assigned as treatment groups for fish meal and soybean meal feed experiments. Sampling of fishes was conducted and the average weight was determined to be 14.5±1.8 grams, and the average length was found to be 11.7±1.5 centimetres. Feeding was provided to all fish in the crates twice daily, with feed amounts calculated based on the weight of the fish. The feeding protocol was adjusted according to the length and weight of the fishes to ensure optimal nutrition. Water quality parameters—including EC, pH, temperature, dissolved oxygen, hardness, alkalinity, and total dissolved solids (TDS)—were assessed and recorded thrice weekly after transferring the fish into the crates. The analyzed water quality parameters are as follows: Dissolved Oxygen (DO) was measured at 3.36 ± 0.43 mg/L, alkalinity at 280.53 ± 51.68 mg/L, hardness at 354.93 ± 93.76 mg/L, Electrical Conductivity (EC) at 54.74 ± 8.69 µS/cm, pH at 7.78 ± 0.27, Temperature (TEMP) at 27.3 ± 0.95 °C, and Total Dissolved Solids (TDS) at 416.8 ± 14.99 mg/L. This consistent monitoring ensured that the water environment remained suitable for the fish throughout the experimental period.

3.2.11. Toxicity evaluation of bio culture product personamedy *717 in freshwater ecosystem like algal and fish model

Project duration: 2024-2025

Principal Investigator:
Kundan Kumar

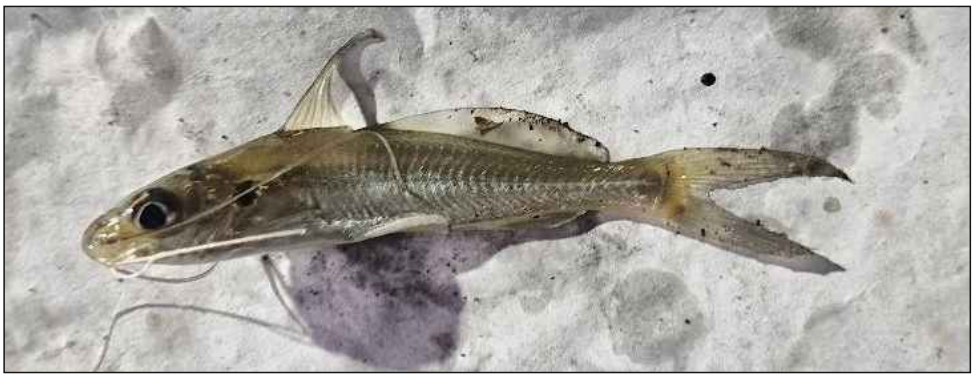
Co-Principal Investigators:
S.P. Shukla, Saurav Kumar

Budget
Rs. 6.76 lakh

Funding agency
J. M. Infra and Enviro technologies PVT. Ltd.

JM Infra & Enviro Technologies Pvt. Ltd., specializes in environmental pollution control, focusing on wastewater collection and treatment. The company designs, fabricates, installs, and commissions sewage treatment plants (STPs) for industries, residential complexes, and commercial establishments. Their services also include bioremediation using specialized bacteria, infrastructure development, ecological restoration of water bodies, and heritage conservation. The present project is to evaluate the toxicological effect of bio culture product personamedy *717 in the freshwater ecosystem. There were five different standard tests of bioassay viz. (i) growth inhibition test on freshwater algae and cyanobacteria; (ii) fish acute toxicity test; (iii) inhibitory effect on freshwater bacteria; (iv) toxicity studies on early life stages of fish (v) heavy metal content. The findings highlight differential responses in growth and pigment synthesis in *Chlorella vulgaris* under various concentrations of the test chemical, with enhanced pigment synthesis and growth was observed. There was no significant mortality in fish (*Labeo rohita* and *Mystus cavasius*) during 96 hours exposure in 3, 5, 7 and 10 ppm of bio culture product personamedy *717. The heavy metal concentrations were below the detectable range, and the Total Plate Count (TPC) was 1.015×10^5 CFU/mL.

(a) Model organism used for the toxicological studies of bio culture product



(b) Model organism used for the toxicological studies of bio culture product

3.2.12 Identification and comparative expression analysis of novel immune-related genes against prevalent bacterial infections and development of remedial measures in Asian seabass, *Lates calcarifer*

Project duration: 2024-2025

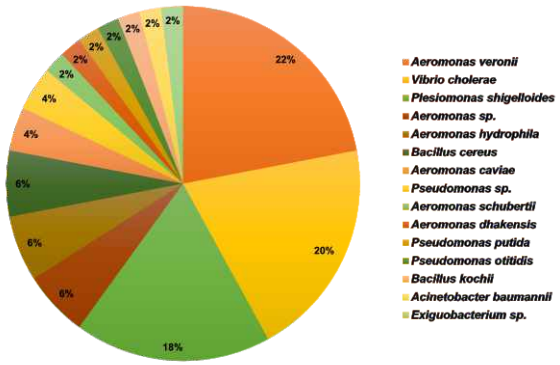
Principal Investigator:
Gayatri Tripathi

Co-Principal Investigators:
Amiya Kumar Sahoo, Dharmendra Kumar Meena, Jeena K, Kiran Rasal, Manish Jayant, R. Bharathi Rathinam

Budget
Rs. 61.059 Lakhs

Funding agency
Department of Biotechnology (DBT), Govt. of India.

Asian seabass is an economically important food fish in tropical and subtropical regions. The transition from brackish to freshwater farming presents significant opportunities for farmers but also poses challenges in disease management. An exploratory survey was conducted in 13 freshwater Asian seabass farms across the states of Andhra Pradesh, Karnataka, Maharashtra, and Gujarat. Fish samples exhibiting clinical symptoms were collected to determine the predominance of bacterial pathogens. A total of 44 Gram-negative bacterial isolates from diseased samples were subjected to phenotypic and molecular characterization to assess their virulence potential. A predominance of Aeromonas (42%), Vibrio (20%), and Plesiomonas (18%) species was observed. Virulence potential assessment identified *A. veronii* as a highly virulent pathogen in freshwater Asian seabass farms. Among the *Aeromonas* isolates, 38% carried the *aerA* gene (encoding aerolysin), while ahh (hemolysin) and act (cytotoxic enterotoxin) genes were present in 76% and 95% of the isolates, respectively. The virulence genes *astA, astB* (heat-stable enterotoxins), and *aphA* (virulence activator) were detected in *Plesiomonas* isolates. Additionally, 90% of *Vibrio* isolates displayed the *hlyA* (hemolysin) and *rtxA* (cytotoxin) genes. The *oprL* (outer membrane lipoprotein) virulence gene was identified in *Pseudomonas* isolates, while *recA* (recombinase) and *dnaK* (stress regulator) virulence genes were found in *Acinetobacter baumannii*. This study represents the first comprehensive effort to catalogue bacterial pathogens associated with freshwater Asian seabass culture systems across four Indian states. By characterizing the virulence potential of these pathogens, the study provides essential insights for monitoring and managing bacterial disease outbreaks in farmed Asian seabass.



Prevalent bacterial pathogens in freshwater farmed Asian seabass

Asian Seabass Exhibiting clinical symptoms

3.2.13 National Surveillance Project on Aquatic Animal Diseases (Phase - II)

Project duration: 2022-2025

Principal Investigator:
Gayatri Tripathi

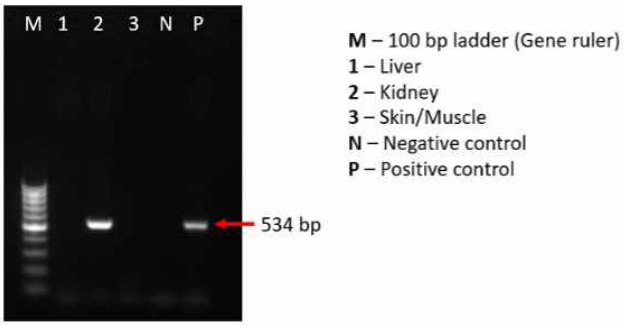
Co-Principal Investigators:
Jeena K, Sreedharan K, R. Bharathi Rathinam

Budget
Rs. 60.01 Lakhs

Funding agency
Pradhan Mantri Matsya Sampada Yojana (PMMSY), Govt. of India

The National Surveillance Programme for Aquatic Animal Diseases (NSPAAD Phase II) conducted comprehensive monitoring and sampling across 47 aquaculture farms in Maharashtra, Haryana, and Gujarat from January to December 2024. Samples of *Litopenaeus vannamei* and *Penaeus monodon* were collected from shrimp farms located in the districts of Raigad, Karjat, Palghar, Ratnagiri, and Thane in Maharashtra. These samples were screened for OIE-listed pathogens, including WSSV, EHP, HPV, IHHNV, MBV, and IMNV. White spots on the carapace and retarded growth were the primary clinical symptoms observed in the shrimp samples. Infections of WSSV and EHP were identified during the reporting period. *P. monodon* samples from Palghar, Maharashtra, tested positive for WSSV, while hepatic microsporidiosis was detected in *L. vannamei* samples from Raigad, Maharashtra. Fish samples of Indian Major Carps, Tilapia, Murrels, and Asian seabass were screened for KHV, VHS, TiPV, TiLV, IPNV, Lymphocystis, SVC, VNN, EHNV, and ISKNV. Clinical signs such as eroded fins, ulcerations, exophthalmia, and excessive mucus production were observed. Tilapia Parvovirus (TiPV) was detected in Tilapia samples collected from the Alipor and Navsari districts of Gujarat, and from the Raigad district in Maharashtra. *Labeo rohita* (Rohu) samples from the fish seed production centre in Pune were found to be infected with *Argulus* (fish lice). The mobile application developed by ICAR-NBFGR for reporting fish and shellfish disease outbreaks, known as the "Report Fish Disease App", was actively promoted, and farmers in contact were encouraged to use it. As part of NSPAAD Phase II activities, a one-day awareness programme on "Fish Health Management and Culture of Improved Fish Varieties" was successfully organized for aquaculture farmers in Nira, Pune. A total of 37 farmers participated in the event. During the programme, discussions focused on the challenges faced by aquaculture farmers due to emerging fish and shellfish diseases, best management practices to prevent disease outbreaks, and the importance of using probiotics as a preferred alternative to antibiotics. A demonstration of the "Report Fish Disease App" was conducted, and participants were encouraged to download and use the app to report disease outbreaks at the farm level.

TiPV Infected Tilapia fish



Positive Amplification for TiPV Infection (534bp) in Tilapia fish

3.2.14 Evaluation of efficacy and safety of functional feed In *Litopenaeus vannamei* under experimental challenge conditions

The present project aims to evaluate the efficacy of TeOra Function Feeds (TOFFs) in improving the survivability and overall health of Pacific shrimp juveniles (Litopenaeus vannamei) when challenged with the White Spot Syndrome Virus (WSSV). The study focuses on determining the potential of TOFFs to boost the resilience of shrimp against WSSV, a major pathogen in aquaculture, and to enhance their immune response and health during viral exposure. This research could provide valuable insights into effective nutritional strategies for mitigating the impact of WSSV in shrimp farming.

Project duration: 2024-2025

Personnel:
Megha K. Bedekar

Co-Principal Investigator:
Saurav Kumar

Budget
Rs. 2.30 Lakhs

Funding agency
TeOra Lifesciences Pvt Ltd.

3.2.15 Efficacy study of *Aeromonas veronii* vaccine

Indian Immunological PVT Limited is a Bangalore-based international company that has recently entered into aquatic vaccines. The company has prepared a batch of killed vaccines for Aeromonas veronii for fish use. CIFE team is testing the efficacy and safety of the batch. The batch has cleared the stability testing. The present vaccination project is being done at Westcoast Farms Nanded. Two batches of IMC (1-5g juvenile) and Tilapia are vaccinated with two doses. Efficacy testing will be done at three months and six months.

Project duration: 2024-2025

Principal Investigator:
Megha Bedekar

Co-Principal Investigator:
Gayatri Tripathi

Budget
Rs. 3.87 lakhs

Funding agency
Indian Immunologicals Pvt

3.3.7 Technology demonstration of premium quality Masmin production in Lakshadweep for domestic and export market

Project duration: 2022-25

Principal Investigator
B.B. Nayak

Co-Principal Investigator
Deepitha R.P.

Budget
Rs. 23.54 lakhs

Funding agency
National Fisheries Development Board (NFDB)

A total of 33 smoke-dried tuna samples were collected from five islands of Lakshadweep—Kalpeni, Amini, Agatti, Kavaratti, and Minicoy—for a comprehensive analysis of their microbial and nutritional quality. These samples were aseptically packed, stored at room temperature, and finely ground for microbial assessment, which included total plate count, total fungal count, total halophilic count, and screening for *Staphylococcus aureus, E. coli, Salmonella spp.,* and *Vibrio spp*. Alongside microbial evaluation, the study also involved proximate composition analysis to determine moisture, protein, fat, ash, salt content, and total phenolic content, providing valuable insights into the nutritional profile of the traditionally processed fish. Masmin, a smoke-dried tuna delicacy, was prepared in a divisional laboratory using the traditional Lakshadweep method. This involved cooking tuna fillets in seawater, followed by repeated cycles of smoking and sun drying until the final product reached a moisture content of less than 15%. To enhance this traditional practice, a customized Masmin smoking unit was developed and demonstrated by a collaborative team from ICAR-CIFE, Mumbai, and KVK, Lakshadweep, on Kavaratti Island. To support local capacity building, several training and awareness programs were conducted across the islands to educate stakeholders on hygienic handling and quality Masmin production. These included a training session on hygienic handling and processing held at Kavaratti Island from 7–15 February 2023 with 14 participants, and an awareness program on Amini Island during the same period with 18 participants. Further training sessions were organized in May 2024, with 30 participants each, focusing on advanced techniques in Masmin production (9 May) and various methods of Masmin utilization (13 May). A design patent for the newly developed smoking unit has also been prepared, marking a significant step towards innovation and standardization in traditional fish processing practices.

3.3.8 Distribution of pathogenic microaerophilic *Arcobacter sp*. in seafood and development of a rapid method for its detection

Project duration: 2021-24

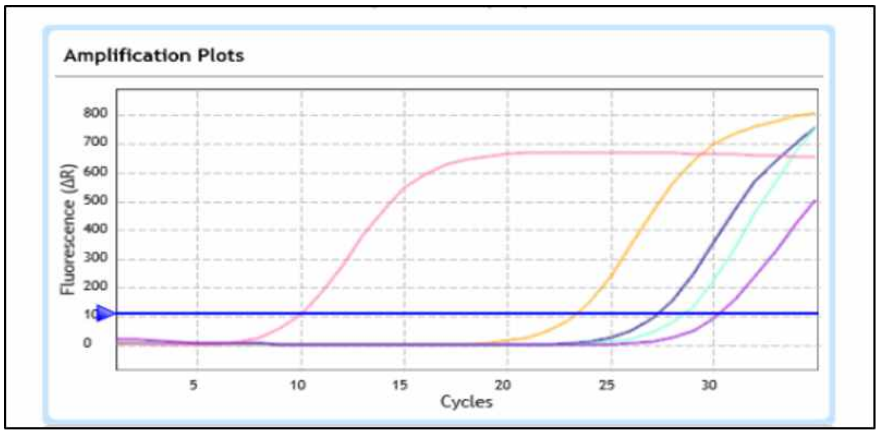
Principal Investigator
B.B. Nayak

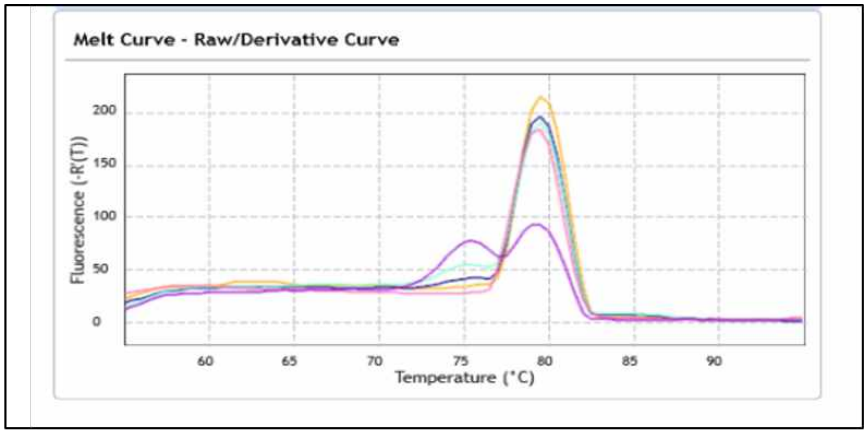
Co-Principal Investigators
Manjusha L, Sanath Kumar H

Budget
Rs. 52.92 lakhs

Funding agency
Department of Biotechnology (DBT), Govt. of India

A conventional MPN-PCR protocol was developed for the detection of *Arcobacter butzleri,* with sensitivity evaluated by inoculating bacterial cells at varying concentrations ranging from 10^3 to less than 1 CFU/ml. The method demonstrated a high level of sensitivity, successfully detecting as few as 1 cell per milliliter. The protocol was further miniaturized to enhance efficiency, and its detection capability was confirmed. To evaluate real-world applicability, the assay was tested on natural samples by artificially inoculating fish muscle tissue with the reference strain A. butzleri ATCC 49616. The method achieved a detection limit of 100 cells per gram of fish meat after a 12-hour enrichment period. Building on this, an MPN-based quantitative real-time PCR (MPN-qRT PCR) assay was developed. The RT-PCR primers designed during the study were highly specific to *A. butzleri*, showing no cross-reactivity with closely related species such as *A. skirrowii* and *A. cryaerophilus*. In recognition of the innovation and its potential applications, a patent application has been filed for the MPN-qRT PCR method developed through this project.





3.3.9 All India Network Project on AMR in fisheries and livestock

Project duration: 2024-26

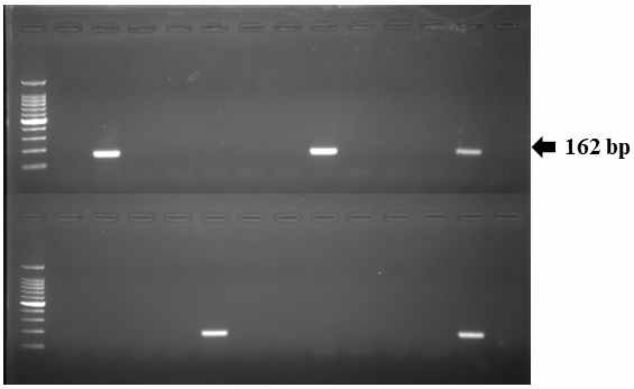
Principal Investigator
Sanath Kumar H

Co-Principal Investigators
Manjusha L, Jeena K, Saloni S

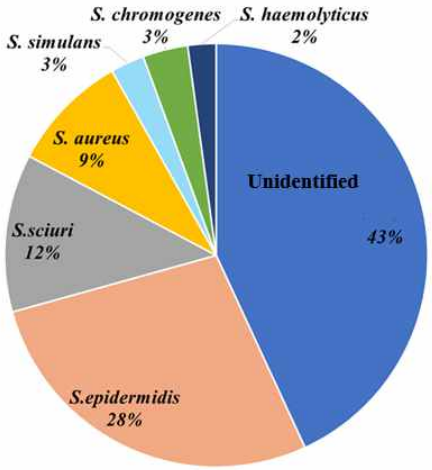
Budget
Rs. 17.00 lakhs

Funding agency
Indian Council of Agricultural Research

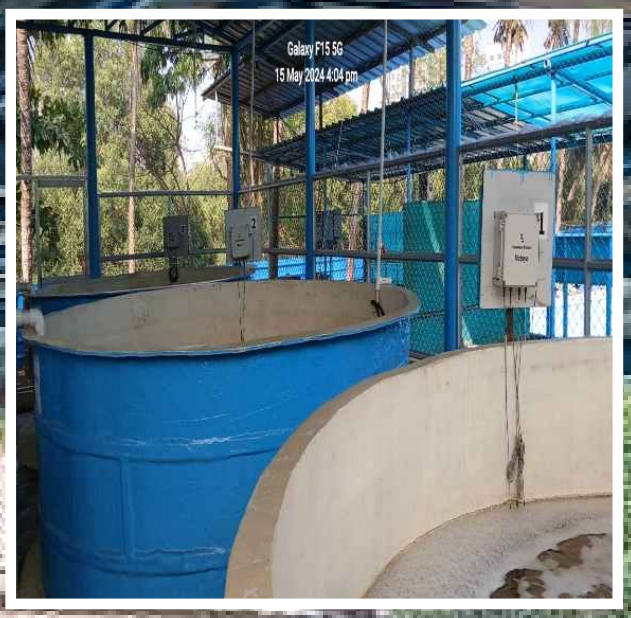
Antimicrobial resistance (AMR) poses a growing challenge across One Health sectors, including aquaculture. In western India, shrimp farming has expanded rapidly over the past two decades. This study conducted a year-long AMR surveillance in shrimp farms across Maharashtra and Gujarat to assess spatial and temporal trends in resistant bacterial pathogens associated with shrimp aquaculture. A total of 160 samples, comprising shrimp (*Penaeus vannamei* and *P. monodon*) and pond water, were collected from four districts. Key bacterial isolates included *Escherichia coli*, *Staphylococcus aureus*, coagulase-negative staphylococci (CoNS), and *Vibrio* spp. Isolates were subjected to biochemical and molecular identification, antimicrobial susceptibility testing, and phenotypic screening for extended-spectrum β-lactamases (ESBLs), methicillin-resistant *S. aureus* (MRSA), and methicillin-resistant CoNS (MR-CoNS). PCR assays confirmed the presence of resistance genes such as *mecA*/*mecC*, *tet*, and *erm* families. *E. coli* showed high resistance to ampicillin (58.6%) and imipenem (31%), with all cephalosporin-resistant strains displaying ESBL phenotypes. *S. aureus* showed high resistance to penicillin (86.7%), moderate resistance to ciprofloxacin (46.7%), low MRSA detection via cefoxitin (6.7%), and no *mecA*/*mecC* gene amplification, indicating a low MRSA prevalence. Resistance to erythromycin and linezolid was observed in 26.7% of isolates. CoNS showed 71.1% penicillin resistance Among CoNS isolates, 42% exhibited cefoxitin resistance, and *mecA*/*mecC* genotypes were detected in 21 isolates. *Vibrio* spp., including *V. parahaemolyticus*, displayed high resistance to ampicillin (55–68%) and cefoxitin (50–85%), but low resistance to meropenem and ciprofloxacin (<5%). The study highlights the importance of robust AMR monitoring, integrated farm management, and improved antimicrobial stewardship within the aquaculture and livestock sectors.



Detection of *mecA* in coagulase-negative *Staphylococcus* (CoNS)



Species distribution of CoNS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3.4.6 ICAR - Network Program on Precision Agriculture (NePPA)

Project duration: 2021-26

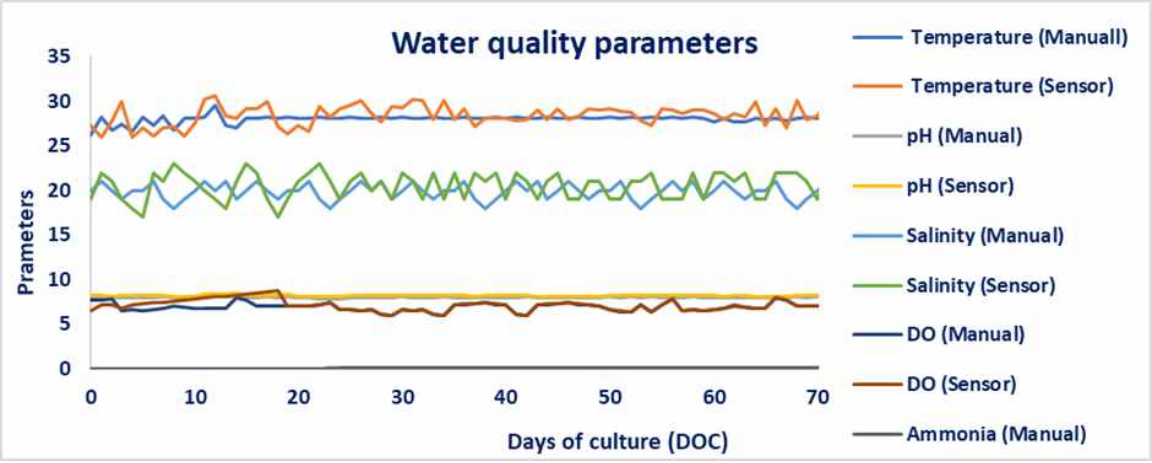
Principal Investigator
Ashutosh D. Deo

Co-Principal Investigators
B.B. Nayak, A.K. Verma, Vinod Kumar Yadav, Vidya Shree Bharti, Karankumar Ramteke, Layana P, Manish Jayant, Arun Sharma

Budget
Rs. 390 Lakhs

Funding agency
ICAR

Under this project, an automated intensive aquaculture system (IAS) was established for shrimp culture, integrating physicochemical sensors for real-time and remote monitoring of water quality. Shrimp were stocked at a density of 300/m³, and water quality parameters remained within optimal ranges throughout the 70-day culture period (pH: 7.71–8.13; Temperature: 25.09–30.02° C; Dissolved Oxygen: 5.99–7.8 ppm; Salinity: 20–22 ppt; Ammonia: 0.05–0.1 ppm). Growth performance indicators were encouraging, with shrimp body weight ranging from 7.87–8.23 g, a feed conversion ratio (FCR) between 1.17–1.31, and survival rates of 67.7% to 71.7%. Sensor data was validated against manually collected data, confirming system accuracy. The IAS significantly improved operational efficiency and minimized human intervention; however, high turbidity posed a challenge for imaging-based shrimp movement analysis. To address this, an AI-IoT-based Decision Support System (DSS) was developed, enabling real-time monitoring of key parameters (pH, DO, temperature) and behavioral analysis. A web-based dashboard was created to visualize sensor outputs and implement predictive models for early disease detection, including White Spot Syndrome Virus (WSSV) and Black Gill Disease. Machine learning algorithms were employed to predict fluctuations in water quality and shrimp behavior, while YOLO-based AI models facilitated shrimp detection, tracking, counting, and biomass estimation. Image classification techniques and Natural Language Processing (NLP) models further enhanced early diagnosis of disease conditions. In parallel, a sensor-based device for shrimp quality assessment was developed using hyperspectral imaging. This system tracked spoilage progression under different storage conditions, focusing on microbial growth and oxidation changes observed in the 600–700 nm wavelength range. The hyperspectral data was correlated with internal fish temperature and visual spoilage indicators, supporting the development of a rapid, non-invasive method for post-harvest shrimp quality monitoring. Collectively, these innovations demonstrate the potential of AI, IoT, and spectral technologies to transform shrimp aquaculture through smarter, more predictive, and sustainable farm management.



3.5.3 In Vitro Differentiation and Characterization of Fish Muscle and Optimization on Plant-Based Scaffolding Towards Whole Cut Seafood Production

Project duration:2021- 2024

Principal Investigators
Mukunda Goswami, CIFE, Reza, Virginia Tech. University, USA.

Budget:
Rs. 69.81 lakhs

Funding agency
Good Food Institute, USA

Muscle cell lines were successfully developed and characterized for four important aquaculture species: *Labeo rohita, Clarias magur, Oreochromis niloticus,* and *Lates calcarifer*. The identity of the myogenic cell types was confirmed through immunocytochemistry using Pax7 and MyoD antibodies, key markers for muscle stem and progenitor cells. To further understand the molecular mechanisms governing muscle development, the expression patterns of myogenic regulatory factors (MRFs)—including MyoD, Myf-5, myogenin, MEF2A, and Mrf4—were analyzed during both proliferation and differentiation phases of the cultured muscle cells. The protein expression profiles across different cell passages provided insights into key signaling pathways active during myogenesis and were also used to identify quality-enhancing peptides associated with different taste profiles—such as sweet, salty, sour, kokumi, and bitter—within the muscle cells. To support cellular morphology and structure, the muscle cells were grown on 2D scaffolds, and successful attachment and cytoskeletal organization were confirmed through phalloidin staining, targeting F-actin filaments.

3.5.4 Whole Genome Sequencing of *Labeo fimbriatus*

Project duration:2021- 2024

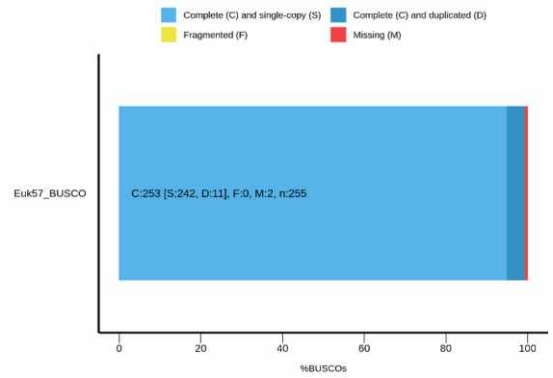
Principal Investigator
Aparna Chaudhari

Co-Principal Investigators
A. Pavan Kumar; Kiran D. Rasal

Budget:
Rs. 28.00 lakhs

Funding agency
CRP Genomics Platform, ICAR

The whole genome of *Labeo fimbriatus* was sequenced using short-read sequencing, yielding a total data output of 29.6 Gb, and long-read sequencing using PacBio Revio, with a data output of 88.8 Gb (Bionivid Technology). The transcriptome sequencing of developmental stages and adult tissues (muscle, gill, testis, ovary, kidney, brain, liver) produced 52 Gb of data. The genome was assembled using *L. rohita* as a reference, producing 25 pseudochromosomes (covering 98.98% of the genome) and 4 small scaffolds, with 95.5% BUSCO completeness confirming high-quality assembly. Total number of genes predicted are 34254, of which 24734 are protein coding genes, 30 are noncoding genes, 378 are pseudogenes and 9112 are LncRNA. Functional annotation analysis (BLAST2GO and KEGG) revealed zinc-binding proteins, primarily zinc finger transcription factors, emerged as the largest molecular function group.



Assessment of genome completeness by BUSCO

3.5.5 Elucidation of molecular mechanism of captive reproduction of *Clarias dussumieri* and derive relevant cues for successful induced spawning of male *Clarias magur*

Project duration:2024- 2027

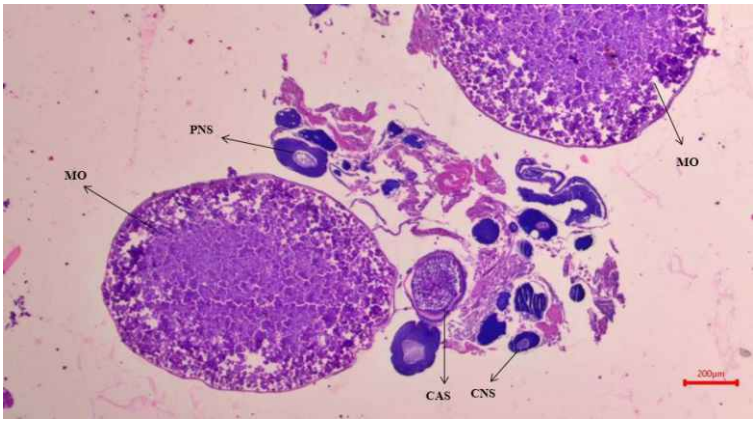
Principal Investigator
Rupam Sharma

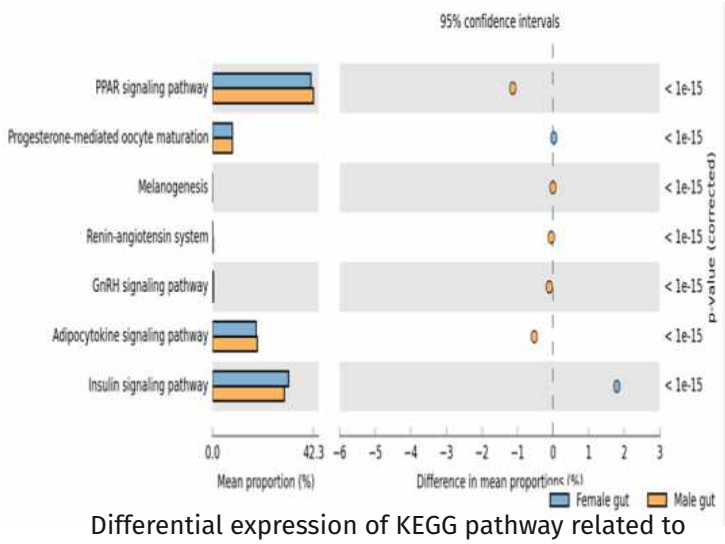
Co-Principal Investigators
Mujahidkhan Pathan, Kiran D. Rasal, Jitendra Kumar Sundaray

Budget:
Rs. 67.32 lakhs

Funding agency
NASF

The project was initiated to uncover the key molecular mechanisms underlying the reproduction of *Clarias dussumieri*, with the goal of enhancing our understanding of its physiological and molecular reproductive intricacies. This knowledge is also intended to be leveraged for comparative analysis with Clarias magur, a species known to face challenges in breeding under confined conditions. Hormonal profiling revealed that female *C. dussumieri* (wild and captive) expressed significantly higher levels of key reproductive hormones—GnRH, FSH, LH, and Estradiol (E2)—compared to their respective male counterparts, indicating a more active reproductive hormonal axis in females. Histological analysis, conducted using an inverted microscope, captured the various stages of oogenesis and spermatogenesis, along with cellular structures in the gonads and liver, providing important anatomical and developmental insights. For molecular analysis, primers were designed and standardized for β-actin as a reference gene, enabling the quantification of differential gene expression in the gonads and brain tissues of C. dussumieri. The gut and skin microbiota of males and females were also analyzed, revealing a total of 366,087 microbial reads comprising 65% bacterial, 22% fungal, 11% viral, and 2% archaeal origins. Notably, the male gut microbiome was found to be richer in species diversity and abundance, as confirmed by taxonomic composition profiling and SIMPER multivariate analysis. This analysis showed significant dissimilarities in the gut microbiome between sexes, while skin microbiota were largely similar. Among the microbial genera, Planococcus and Actinoplanes emerged as key contributors to KEGG pathways potentially linked to reproductive function. To explore the genetic underpinnings of reproduction, 13 specific reproductive genes—including STAR, 17βhsd2, Sox9a, CYP17a1, CYP11a1, LHβ, FSHβ, LHR, FSHR, SPATA2, 17βhsd3, SPNR, and β-





Differential expression of KEGG pathway related to Endocrine system

actin—were selected, and species-specific primers were designed for both *C. magur* and *C. dussumieri*. Standardization and expression analysis were successfully completed for four of these genes—STAR, Sox9a, 17βhsd2, and β-actin—in male and female samples of *C. dussumieri*. These findings lay the groundwork for a deeper comparative understanding of reproductive gene regulation between *C. dussumieri* and *C. magur*, and hold potential for addressing breeding challenges in captivity through molecular and microbiome-informed strategies.

3.5.6 Characterization of adaptive and resilient molecular responses to thermal stress in *Labeo rohita* through multi-omics approach

Project duration:2024- 2026

Principal Investigator
N. S. Nagpure

Co-Principal Investigators
Mukunda Goswami, Manoj P. Brahmane, Kiran D. Rasal, Sunil Kumar, Sudhir Srivastava

Budget:
Rs. 20 Lakhs

Funding agency
Network Project on Agricultural Bioinformatics and Computational Biology" of ICAR-IASRI

Understanding fish embryonic development and reproductive systems is essential for advancing both biological research and conservation efforts. In this study, the impact of heat stress on embryonic development in *Labeo rohita* (rohu) was investigated through RNA sequencing of fertilized eggs. Six spawn samples, three from a control temperature range (27–28°C) and three from a high-temperature stress group (33–34°C) were collected three days post-hatching for transcriptomic analysis. High-throughput RNA sequencing was conducted on the Illumina platform using paired-end reads, generating a total of 65 Gb of sequence data. The sequencing reads were aligned to the *L. rohita* reference genome (IGB Ref genome; GCF_022958175.1), resulting in a high mapping rate of 87.17% and the assembly of 30,667 contigs. Differential gene expression analysis was performed using DESeq2, identifying a total of 179 differentially expressed genes (DEGs) between the heat-stressed and control groups (Log2 fold change > 2, $P < 0.05$). Among these, 18 genes were significantly upregulated, and 12 genes were significantly down regulated, suggesting their potential involvement in regulating early embryonic responses to elevated temperatures. These genes may influence crucial developmental pathways, stress responses, and survival outcomes under heat-stress conditions. This study provides valuable molecular insights into how thermal stress affects embryonic development in rohu, offering a basis for improving climate-resilient breeding programs and informing future conservation strategies for freshwater fish species vulnerable to temperature fluctuations driven by climate change.

3.6.2 Swachhta Action Plan (SAP) Management and Commercial Utilization of Fish Waste in Fish Market

Project duration: 2023-26

Principal Investigator
Arpita Sharma

Co-Principal Investigators
Swadesh Prakash, Ajit Verma, VidyaShree Bharti, Prem Kumar

Budget
Rs. 20 Lakhs

Funding agency
ICAR New Delhi

As part of the Swacchta Action Plan, extensive cleanliness and hygiene interventions were carried out across seven fish markets in Mumbai, Delhi, and Nagpur, focusing on waste management and infrastructure improvement. Notably, one fish market in Mumbai underwent complete upgrades, including flooring, wall tiling, platform construction, drainage, and roof repair, with challenges during implementation duly recorded. A total of four training programmes on FishANUre®—an organic manure derived from fish waste—were organized at Nagpur, Gazipur, Delhi, and Mumbai, engaging 200 participants (138 women, 62 men). This entrepreneurship model was also introduced in two training sessions for fish farmers from Bihar. Additionally, three digital payment training sessions for fish retailers were held in Mumbai and Gazipur, benefiting 133 participants (126 women, 7 men). FishANUre® was showcased at five exhibitions organized by ICAR-CIFE in Mumbai and Delhi to promote clean technology and sustainable waste practices. In support of hygiene infrastructure, essential inputs such as ice boxes, water filters, fly catchers, dustbins, weighing scales, masks, and gloves were distributed to fish market societies in all three cities.

Further, fish manure's compatibility with entomopathogenic nematodes was assessed and samples submitted for Next-Generation Sequencing (NGS) analysis. An ergonomic 'Fish on Wheels' trolley was designed using CAD software through a participatory process involving fisherwomen, and a prototype AI-powered dustbin is under development, integrating field data and highlighting the role of cleaning workers. In parallel, laboratory trials of odour adsorbents have been initiated, with preliminary results indicating potential solutions to mitigate fish odour—backed by a literature review on associated health and environmental concerns. Trials have also commenced to explore the use of fish waste as a fertilizer for culturing live feed (Daphnia/Mina). Another innovative avenue is the testing of fish bone char as a heavy metal adsorbent, with planned comparisons to other bone chars and potential integration into aquaculture systems. Awareness activities targeting farmers on heavy metal contamination have been initiated.

A project video highlighting these achievements has been developed and showcased at seafood festivals in Mumbai, with 119 views to date and accessible via the CIFE YouTube channel. In terms of outreach, the project produced one training manual, two English leaflets, two Hindi leaflets, one Marathi leaflet, and Swacchta-themed placards. A significant milestone was the granting of a trademark for FishANUre® by the Trademark Office of India. Further, the FishANUre® technology has been successfully licensed to FISHOCPFED, Patna, Bihar as a Do-It-Yourself (DIY) innovation (CIFE ITMU Technology No. 23F/PD/0102), paving the way for scalable commercialization and sustainable waste valorization in the fisheries sector.

3.6.3 Agri-Drone Technology Demonstration Project

Project duration: 2022-26

Principal Investigator
Ananthan P.S

Co-Principal Investigators
A. K. Verma, Shivaji Argade, Abuthagir Iburahim, Gourang Biswas, Muralidhar Ande, Sunil Kumar Nayak, Md. Aklakur and Pankaj Kumar

Budget
Rs. 35 Lakhs

Funding agency
Ministry of Agriculture and Farmers' Welfare, New Delhi

The Agri-Drone Technology Demonstration Project was launched to introduce and promote the use of drone technology in fisheries and aquaculture management, providing hands-on demonstrations to fish farmers, students, and other stakeholders. The initiative began with the procurement of two advanced agricultural drones equipped with high-resolution cameras, sensors, and spraying/spreading mechanisms designed for precision operations. A specialized team of drone pilots—Dr. Ananthan P. S., Dr. Shivaji Argade, Mr. Abuthagir, Mr. Udipta Roy, and Dr. Pawan Kumar—was trained to operate and manage the drones and facilitate the demonstration sessions.

Over the course of the project, 50 demonstration sessions were conducted across various strategic locations, directly benefiting more than 400 shrimp and fish farmers. In addition, three hands-on training workshops were organized, with enthusiastic participation from over 200 students from ICAR-CIFE and other fisheries institutions. These demonstrations not only showcased the potential applications of drone technology in pond monitoring, input application, and data-driven management but also emphasized its role in cost and time efficiency, contributing to improved farmer income.

Despite initial technical and logistical challenges, the overall feedback from participants was highly positive, highlighting the project's practical value and future potential. In 2024, focused efforts were made to popularize drone applications in aquaculture among farmers, youth, and the general public. A project video capturing the essence of the drone demonstrations is available on the CIFE YouTube channel, further promoting awareness and engagement.

Drone demo at Shrimp Farm, Saphale

Moving ahead, the project envisions scaling up demonstrations and training across India, especially in fish and shrimp farming regions, to empower more farmers with modern, tech-driven solutions for sustainable aquaculture.

Drone demo to fish farmers from Bihar during aquapreneurship development training

3.7.5 Captive breeding of Hilsa, *Tenualosa ilisha*: Phase II

Project duration: 2021-24

Principal Investigator
Subrata Dasgupta (Till January, 2023), G. Biswas (February, 2023 onwards)

Co-Principal Investigators

Gayatri Tripathi, Mujahidkhan A. Pathan (Till June, 2023), Kiran Rasal (June, 2023 onwards), T.K. Ghoshal (August, 2023 onwards)

Budget
Rs. 69.91 Lakhs

Funding agency
NASF, ICAR, New Delhi

A field validation study was conducted to assess the effectiveness of anesthesia in pond-reared hilsa (*Tenualosa ilisha*), with the objective of facilitating safe and stress-free handling during reproductive interventions. At the Kakdwip center, anesthesia was successfully applied during egg collection via cannulation using a capillary tube, with no signs of physical injury to the fish, demonstrating the safety and efficacy of the method. Similarly, at Kolaghat, anesthesia was administered to hilsa brooders for maturity assessment through ultrasonography, which was also successful across multiple trials. After evaluating various doses, it was concluded that a concentration of 80 mg/L of MS-222 (tricaine methanesulfonate) was the optimal dose for effective anesthesia in captive hilsa, ensuring minimal stress and high recovery rates.

In parallel, luteinizing hormone (LH) gene expression in the pituitary of early spawning-stage female hilsa was analyzed following induction with different agents, including a commercial inducing agent and synthetic LHRH. Statistical analysis using ANOVA revealed no significant differences ($P > 0.05$) in LH gene expression levels among the treatment groups and control, suggesting that both inducing agents exert comparable effects on pituitary LH expression during the early spawning stage. These findings contribute valuable insights for developing safe broodstock management protocols and optimizing reproductive handling techniques for hilsa under captive conditions.

3.8.2 Genetic improvement of common carp *Cyprinus carpio* for inland saline aquaculture: Strain development for underutilized water resources (Phase I)

Project duration: 2023-25

Principal Investigator
Mujahidkhan A. Pathan

Co-Principal Investigators
Aparna Chaudhari, Angom Lenin Singh, Babita Rani, Pankaj Kumar, Shreedharan K, Md. Aklakur, Sunil Kumar Nayak, Dhalong Se Reang

Technical Associates
Ashok Kumar, Satyender Kumar Singh, Reshma Raje

Budget
Rs. 9.28 Crores

Funding agency
Department of Fisheries, Ministry of Fisheries, Dairying and Animal Husbandry, Government of India

In March–April 2024, approximately 340 families (F1, Batch II) of common carp were produced and reared separately in hapas until they reached taggable size. Passive Integrated Transponder (PIT) tagging was conducted in August 2024, with 6,000 fish randomly selected and tagged from these families. The tagged fish were then released into grow-out ponds in September 2024 across three geographical locations—CIFE Rohtak (Haryana), CIFE Powarkheda (Madhya Pradesh), and CIFE Motipur (Bihar)—and at three different salinity levels: freshwater, 2–4 ppt (S1), and 6–8 ppt (S2). Specifically, 4,000 tagged fish were released at CIFE Rohtak (2,000 each in S1 and S2 salinity), and 1,000 each at Powarkheda and Motipur in freshwater conditions.

The genetic evaluation of F1 Batch I for growth traits has been completed. At the time of stocking, the fish exhibited an average body weight (Bw) of 23.09 g, body length (Bl) of 8.97 cm, and body height (Bh) of 3.03 cm. After 340 days of pond rearing, the fish cultured at S1 salinity (2–4 ppt) demonstrated significantly superior growth, with average values of 1088.64 g (Bw), 30.88 cm (Bl), and 11.78 cm (Bh), compared to fish at S2 salinity (6–8 ppt), which recorded 745.75 g (Bw), 27.68 cm (Bl), and 10.33 cm (Bh). Notably, body weight heritability estimates at harvest were high—0.59±0.09 for S1 and 0.46±0.08 for S2—suggesting strong genetic control over growth traits. Additionally, moderate genetic correlations ranging from 0.64 to 0.85 between growth traits in different salinity conditions highlighted the presence of genotype × environment (G×E) interactions. To promote the use of improved genetic stocks, 1.5 tons of high-performing brooders were distributed to the Fisheries Department of Haryana and local fish farmers for large-scale seed production. Furthermore, 10,000 advanced fingerlings were supplied to farmers in Haryana and Rajasthan, supporting enhanced aquaculture productivity and seed dissemination at a regional scale.

3.8.3 Establishment of a Bio-resource Facility of Zebrafish (*Danio rerio*): A national genetic repository for wild type and inbred Zebrafish - Phase I

Project duration: 2023-25

Principal Investigator
Mujahidkhan A. Pathan

Co-Principal Investigators
Aparna Chaudhari, Angom Lenin Singh, Jeena K.

Budget
Rs.70 Lakhs

Funding agency
National Fisheries Development Board, Department of Fisheries (NFDB)

A total of 284 zebrafish matings were attempted at the CZeBraG facility, resulting in 120 successful spawning events. The study involved four distinct zebrafish lines—Line 1, Line 2, Line 3 (inbred lines), and a random bred line (NS)—with inbreeding coefficients (Fx) of 0.63, 0.59, 0.25, and 0, respectively. Using a full-sib mating design, 110 full-sib families were generated, comprising 9 families from Line 1, 26 from Line 2, 65 from Line 3, and 10 from NS. Key performance traits were evaluated, including fecundity at first spawning (measured as the number of fertilized eggs), survival traits at 5 days post-fertilization (5 dpf) and 45 dpf, and growth traits at 45 dpf such as body weight (BW), standard length (SL), and body depth (BD). Heritability estimates for these traits ranged from 0.36 to 0.75, indicating moderate to high genetic control, suggesting strong potential for selective breeding. No significant differences were observed in fecundity across the four lines. For survival traits, Line 1 exhibited the highest survival at 5 dpf, and comparable performance with Line 3 and NS at 45 dpf. Line 2 consistently showed the lowest survival rates at both time points. In terms of growth performance, the NS line outperformed all inbred lines, followed by Line 3, Line 2, and Line 1, with performance declining as the inbreeding coefficient increased. This pattern underscores the negative effects of inbreeding depression on growth traits, while the random bred line (NS) demonstrated superior phenotypic expression for all measured growth traits. As part of outreach and research support, approximately 800 zebrafish seeds were distributed to various research organizations including Jai Research Foundation, Dabur India, Haffkine Institute, and others, contributing to broader toxicological, biomedical, and genetic studies. These findings highlight the importance of genetic background and inbreeding management in zebrafish lines for experimental research and stock improvement.

3.10.3 Utilization of open race-way cultured micro-algae *Chlorella vulgaris* (CV) in the diet of *Clarias magur* fingerlings

Project duration: 2023-25

Principal Investigator
Shamna N

Co-Principal Investigators
Yogendra Shastri, Parimal Sardar

Budget
Rs. 11.91 Lakhs

Funding agency
RGSTC, Govt of Maharashtra

The raceway culture of *Chlorella vulgaris* (CV) was successfully standardized under natural daylight conditions, enabling scalable biomass production in open systems. While the open-cultured CV showed slightly lower crude protein (45.54%) and crude lipid (8.12%) compared to laboratory-cultured stocks (53.22% CP and 11.70% lipid), it exhibited higher total ash content (13.02%) and reduced levels of sulfur, phosphorus, and magnesium. A 4000 L raceway pond system yielded a biomass concentration of approximately 1.6 g/L after 28 days, establishing a viable model for large-scale algal cultivation. The nutritional potential of the raceway-grown biomass was evaluated through feeding trials in *Clarias magur* (Asian catfish) fingerlings. Formulated diets incorporating 21.8% Chlorella vulgaris meal (CVM) demonstrated that CVM could effectively replace up to 75% of fish meal at a 20% dietary inclusion level, based on protein equivalence. This substitution did not compromise growth performance or induce any negative physiological or metabolic responses, confirming the utility of CVM as a sustainable and cost-effective fish meal alternative. In a separate experiment, the ethanolic extract of CV was evaluated for its impact on feed intake and behavior in *C. magur* larvae. A total of 240 larvae were randomly distributed across four treatments: control, T0.1 (0.1% extract), T0.5 (0.5% extract), and T1 (1% extract). Over a 90-day feeding trial, the 0.5% inclusion level (T0.5) resulted in the highest feed intake, enhanced growth, and reduced cannibalism, indicating that moderate levels of CV extract can improve feeding behavior and survival in the early developmental stages of *C. magur*. Collectively, these studies underscore the nutritional and functional value of *Chlorella vulgaris*—both as a protein-rich feed ingredient and a natural feed attractant—for enhancing growth, immunity, and behavior management in catfish aquaculture while promoting sustainable feed formulations through fish meal replacement.

3.10.4 Evaluation of String Bio products in fish and shellfish feed

Project duration: 2023-24

Principal Investigator
Shamna N

Co-Principal Investigators
Karthireddy Syamala, Muralidhar P. Ande

Budget
Rs. 2.35 Lakhs

Funding agency
String Bio Pvt Ltd, Bengaluru

A 60-day feeding trial was conducted to evaluate the growth performance and immune responses of Pacific white shrimp (*Penaeus vannamei*) post-larvae fed diets containing two variants of single-cell protein (SCP) derived from methanotrophic bacteria: a bacterial meal extract (BME) and a hydrolyzed protein meal (BMH). Seven isonitrogenous (35% crude protein) and isolipidic (6%) diets were formulated, including a control diet without SCP (Tc), three diets supplemented with BME at 0.1%, 0.5%, and 2.0% (TE0.1, TE0.5, TE2.0), and three diets with BMH at 0.1%, 0.5%, and 2.0% (TM0.1, TM0.5, TM2.0). The results revealed that shrimp fed the diet containing 0.5% nucleotide-rich BME (TE0.5) exhibited significantly improved ($p<0.05$) survival rate, growth performance, moulting frequency, protein utilization, total antioxidant status, and expression of the immune-related gene crustin. These enhancements were followed by the group receiving 2.0% BMH (TM2.0), which also showed notable improvements in performance. No significant differences ($p>0.05$) were observed in digestive and metabolic enzyme activities among the treatments. However, dietary inclusion of BME and BMH resulted in reduced expression of stress-related genes, including heat shock protein 70 (HSP70) and prophenoloxidase (proPO), compared to the control group, while the specific activity of prophenoloxidase enzyme was elevated, suggesting functional enhancement of immune responses. The study concludes that dietary supplementation with 0.5% BME or 2.0% BMH effectively promotes growth and immune modulation in *P. vannamei* post-larvae, supporting their application as sustainable and functional feed ingredients in shrimp aquaculture.

3.10.5 Effect of feeding rice bran supplemented with exogenous enzyme on digestion, nutrient utilization and growth of carps

Project duration: 2024-25

Principal Investigator
Shamna N

Co-Principal Investigators
Muralidhar P. Ande, Shobha Rawat

Budget
Rs. 3.12 Lakhs

Funding agency
Sri Venkatarama Gia Pvt LTD, Andhra Pradesh

This project aims to evaluate the potential of rice bran, a widely available agro-industrial byproduct, as a sustainable feed ingredient for carps when supplemented with exogenous digestive enzymes. The study focuses on improving the digestibility, nutrient utilization, and growth performance of carps by mitigating the anti-nutritional limitations of raw rice bran through enzyme-enhanced formulations. The experimental design involves the formulation of isonitrogenous diets incorporating rice bran with and without supplementation of exogenous enzymes targeting fiber and phytate breakdown. All required ingredients have been successfully procured, and experimental diets have been formulated and prepared. The feeding trial is currently underway at the Freshwater Fish Farm Facility (FWFF) in Balabhadrapuram. During the trial, carps are being monitored for growth parameters, feed intake, and nutrient assimilation. Post-trial analyses will include digestive enzyme activity, feed conversion efficiency, and proximate body composition to assess the impact of enzymatic enhancement on rice bran digestibility. The outcomes of this study are expected to provide valuable insights into low-cost feed optimization and promote the utilization of agricultural byproducts in carp aquaculture, thereby contributing to cost-effective and eco-friendly fish farming practices.

3.11.2 Technology demonstration of Singhi catfish culture in Recirculatory Aquaculture System (RAS) and entrepreneurship development in the region

Project duration: 2023-25

Principal Investigator
MD Aklakur

Co-Principal Investigator
Ashutosh D Deo

Budget
Rs. 38.95 Lakhs

Funding agency
NFDB

With the growing global population and diminishing availability of arable land, the demand for sustainable and nutrient-rich food sources continues to rise. Aquaculture, recognized as one of the most efficient methods of animal protein production, holds great promise to help bridge the nutritional gap. System intensification has become essential to meet increasing demand while minimizing resource use. In this regard, Recirculating Aquaculture Systems (RAS) have emerged as a transformative solution, enabling high-density fish production within a compact footprint while significantly reducing water usage.

This project was launched with the primary objective of identifying operational challenges faced by farmers using RAS technology. The team conducted a critical assessment of existing RAS installations by engaging fish farmers across Bihar and Jharkhand through surveys, field visits, and stakeholder consultations. Key challenges observed included inefficient water quality management, biofiltration issues, high energy consumption, complex operational demands, and species compatibility concerns. These insights formed the foundation for developing a farmer-friendly, technically sound RAS model—named "MOTIRAS". The MOTIRAS system incorporates modular design principles to simplify management, coupled with efficient water recirculation, improved biofiltration, and energy-efficient aeration systems, making it especially suitable for small- to medium-scale aquaculture operations in resource-limited regions. The system is optimized for the culture of hardy and commercially important species such as Common carp (*Cyprinus carpio*), Singhi (*Heteropneustes fossilis*), Anabas (*Anabas testudineus*), and for the rearing of Indian Major Carp (IMC) seed. To ensure scalability and adoption, the MOTIRAS model was successfully transferred and commercialized in partnership with King Fisheries, a private aquaculture enterprise in Ranchi, Jharkhand. The system is currently operational and yielding encouraging results in terms of growth performance, feed conversion efficiency, and maintenance ease. Its ability to support multi-species culture within the same unit highlights its versatility and adaptability to regional farming needs and market preferences. This initiative serves as a model for promoting sustainable intensification in inland aquaculture, offering practical solutions to empower farmers while ensuring environmental responsibility.

Chapter 4
Extension Achievements


আধুনিক পদ্ধতিতে মিষ্টি জলের মাছের চাষ
পশ্চিমবঙ্গের পুরুলিয়া জেলার তফশীলি উপজাতির মৎস্যচাষীদের তিন দিনের প্রশিক্ষণ শিবির
তুইমা-বাড়াডি হেমাল উমুল
জল ব্যবহারকারি সমিতি
Regd. No. : S0005619 of 2019-2020
গ্রাম ঃ- তুইমা-বাড়াডি, পোষ্ট ঃ- সুপুরডি

4.1 Training Programs Organized under Tribal-Sub Plan

Nodal Officer: Dr. Munilkumar Sukham

Under the Development Action Plan for Scheduled Tribes/Tribal Sub-Plan (DAPST/TSP) scheme, ICAR-CIFE facilitated various capacity-building activities targeting Scheduled Tribe (ST) communities across India. Through collaborations with Krishi Vigyan Kendras (KVKs) and Fisheries Colleges, 46 training programs were organized during 2024, benefiting 1715 participants (Male: 1212, Female: 503). These programs focused on areas such as modern and sustainable freshwater aquaculture, fish breeding and hatchery operations, broodstock management, value-added fish product preparation, fish-based integrated farming systems, cage culture, biofloc technology, DNA sequencing, and genetic improvement in aquaculture species. The programs were conducted in Tripura (Sepahijala, Unakoti, Gomati, Dhalai), West Bengal (Bankura, Purulia, Malda), Mizoram (Mamit, Aizawl), Meghalaya (Ri Bhoi, West Khasi Hills, Jaintia Hills, Umiam), Assam (Lakhimpur, Udalguri), Jharkhand (East Singhbhum, Hazaribagh), Maharashtra (Palghar, Pune, Mumbai), Andhra Pradesh (Kakinada), Gujarat (Tapi, Nandurbar), and Telangana (Alluri Sitharama Raju). In addition to the knowledge and skill imparted, critical aquaculture inputs were distributed, which comprised fish seed (10.76 lakhs), fish feed (74.39 tonnes), lime (16.60 tonnes), and pH testing kits (120 Nos.) Dissolved oxygen (DO) testing kits (120 No.), Nets (111 No.), medicines (275 units), fish brooders (140 Nos.), etc. These programs significantly supported the upliftment of tribal communities by enhancing aquaculture-based livelihoods through scientific management practices. The training programs organized under TSP scheme during the year 2024 are listed Table 1.

Table 1: The training programs organized under TSP scheme during the year 2024

Title	Name of Coordinator(s)	Dates & Place	No. of Participants Total (Male, Female)
Composite Fish Culture	Dr. Munilkumar Sukham Dr. Shatabhisa Sarkar	11 January 2024 KVK, Sepahijala	16 (M: 16, F: 0)
Zero Waste Utilization of Fish	Dr. H. Mandakini Devi Dr. Leesa Priyadarsani	08-10 January 2024 ICAR-CIFE, Kolkata	30 (M: 30, F: 0)
Modern Methods of Freshwater Aquaculture	Dr. H. Mandakini Devi Dr. Leesa Priyadarsani	08-10 January 2024 ICAR-CIFE, Kolkata	30 (M: 23, F: 07)
Composite Fish Culture	Dr. Munilkumar Sukham Dr. Shatabhisa Sarkar	18 January2024 KVK, Sepahijala	10 (M: 10, F: 0)
Integrated Aquaculture, Fish Processing and Value-added Fish Products Preparation	Dr. Munilkumar Sukham Dr. Biswajit Bal	02 February 2024 KVK, Unakoti, Chantail, Kailashahar	25 (M: 0, F: 25)
Bio floc Technology/ Freshwater Aquaculture	Dr. Munilkumar Sukham Mr. Om Prakash	04-06 February 2024 KVK, Kondagaon	60 (M: 20, F: 40)
Modern Methods of Freshwater Aquaculture	Dr. Parimal Sardar	05-07 February 2024 ICAR-CIFE, Kolkata	30 (M: 28, F: 02)
Aqua Feed Production Technology and Feeding Management for Freshwater Aquaculture	Dr. Sikendra Kumar	14-16 February 2024 KVK, Palghar	20 (M: 13, F: 07)
Aquaculture Focusing on Carp Fish Breeding and Hatchery Operations	Dr. Munilkumar Sukham Dr. Vanlalhruaia Hnamte	19-23 February 2024 KVK, Mamit	35 (M: 18, F: 17)
Scientific Fish Farming in the Water Bodies	Dr. Munilkumar Sukham Dr. Moumita Dey Gupta	27-29 February 2024 KVK, Sonamukhi	30 (M: 30, F: 0)
Modern Methods of Freshwater Aquaculture	Dr. T. K. Ghoshal Dr. Sujata Sahoo Dr. Suman Manna	27-29 February 2024 KVK, Bankura	30 (M: 12, F: 18)
Fish Breeding and Hatchery Management	Dr. Munilkumar Sukham Dr. Syam K. R.	29 February - 03 March 2024 KVK, Dhalai Salema	22 (M: 09, F: 13)
Fish-based Integrated Farming System for Farm Women	Dr. Munilkumar Sukham Dr. Biswajit Debnath	04-02 March 2024 KVK, South Tripura	25 (M: 0, F: 25)
Integrated Fish Farming	Dr. Munilkumar Sukham Dr. M. Mokidul Islam	06-08 March 2024 KVK, Ri Bhoi Umiam	30 (M: 01, F: 29)
Fish-based Integrated Farming System	Dr. Munilkumar Sukham Dr. L. Warjri	06-08 March 2024 KVK, West Khasi Hills	25 (M: 07, F: 18)
Integrated Fish Culture and Fish Health Management	Dr. Munilkumar Sukham Dr. M. Mokidul Islam	11-13 March 2024 KVK, Ri Bhoi Umiam	25 (M: 19, F: 04)
Fish-based Integrated Farming System	Dr. Munilkumar Sukham Dr. L. Somendro Singh	12-14 March, 2024 KVK, Churachandpur	25 (M: 20, F: 05)

Aquaculture for Livelihood and Improving Socio-economic Status	Dr. Munilkumar Sukham Dr. Somendra Kumar	12 March 2024 KVK, North Tripura	20 (M: 11, F: 09)
Fish-based Integrated Farming System	Dr. Munilkumar Sukham Dr. N. Soranganba	12 March 2024 KVK, Churachandpur	30 (M: 25,F: 05)
Value Added Fish Product Development for Farm Women	Dr. Munilkumar Sukham Dr. Biswajit Debnath	13-21 March 2024 KVK, South Tripura	25 (M: 0, F: 25)
Sustainable Freshwater Aquaculture Practices	Dr. Munilkumar Sukham Dr. N. Soranganba	13 March 2024 KVK, Churachandpur	25 (M: 18, F: 07)
Enhancement of Fish Productivity through Farmer Participatory Research	Dr. Munilkumar Sukham Dr. N. Soranganba	14 March 2024 KVK, Churachandpur	28 (M: 16, F: 12)
Cage Culture for Fish Farmers of Sardar Sarovar Reservoir	Dr. Kapil Sukhdhane Dr. Munilkumar Sukham Dr. Debajit Sarma	14 March 2024 Nandurbar	174 (M: 167, F: 07)
Demonstration-Cum- Training Program on Fisheries Activities	Dr. Munilkumar Sukham Dr. Pradyut Biswas	14-16 March,2024 CoF, Lembucherra	30 (M: 16, F: 14)
Fish Processing and Value-Added Fish Products	Dr. Munilkumar Sukham Dr. L. Warjri	14-16 March 2024 KVK, West Khasi Hills	27 (M: 05, F: 22)
Broodstock Management and Seed Production of *Clarias magur*	Mr. Dhalongsaih Reang Dr. Munilkumar Sukham Dr. Arun Sharma Dr. T. I. Chanu Dr. Sunil Kumar Nayak Mr. Alish Debbarma	14 March 2024 KVK, Gomati District	23 (M: 21, F: 02)
Genetically Improved Fish Species for Aquaculture	Dr. Manoj P. Brahmane Dr. Arvind Sonwane Dr. Kiran Rasal	15-16 March 2024 Junnar, Pune	100 (M:80, F:20)
Integrated Fish Farming	Dr. Munilkumar Sukham Dr. Pasweth	19-22 March 2024 KVK, Jaintia Hill	25 (M: 12, F: 13)
Entrepreneurship Development through Commercial Fish Farming	Dr. Munilkumar Sukham Dr. P. K. Pathak	19-27 March 2024 KVK, Lakhimpur	75 (M: 41, F: 34)
Fish Based Integrated Farming System	Dr. Munilkumar Sukham Dr. Lalrohlupuii	27 March 2024 KVK, Aizwa	26 (M: 18, F: 08)
Ornamental Fish Culture: Potential & Opportunities	Dr. Shamna N. Mrs. Shobha Rawat Dr. Muralidhar P. Ande Dr. K. Syamala Mr. Rajeev	19-21 June 2024 ICAR-CIFE, Balabhadrapuram	10 (M: 02, F: 08)
Seed Production and Rearing of GIFT and Jayanti Rohu	Dr. Kiran Rasal	25-27 July 2024 Patas, Pune	50 (M: 50, F: 0)
Cage Aquaculture: A Profitable Livelihood Option	Dr. Madhuri Pathak Dr. Kapil Sukhdhane Dr. Debajit Sarma	13-14 August, 2024 ICAR-CIFE, Mumbai	18 (M: 18, F: 0)
Polyculture of Air-breathing Fish with Carp using Different Feeds	Dr. Munilkumar Sukham Dr. Shailesh Kumar	03-08 September 2024 KVK ,Malda	60 (M: 35, F: 25)

Modern Methods of Freshwater Aquaculture	Dr. T. K. Ghoshal Dr. Suman Manna	26-28 September 2024 Khatra, Bankura	20 (M: 20, F: 0)
Modern Methods of Freshwater Aquaculture	Dr. T. K. Ghoshal Dr. Suman Manna	03-05 October 2024 Barabazar, Purulia	20 (M: 06, F: 14)
Capacity Building of Scheduled Tribe Farmers	Dr. Dilip Kumar Singh	16-18 October 2024 East Singhbhum	20 (M: 12, F: 08)
Aquaculture for Livelihood and Improving Socio-economic Status	Dr. Munilkumar Sukham Mr. Alish Debbarma	07-09 November 2024 KVK, Gomati	25 (M: 25, F: 0)
Fish Genetic Improvement Program for Enhancement of Aquaculture Production	Dr. Mukunda Goswami Mr. Angom Lenin Singh	07-08 November 2024 Udalguri, BTC	100 (M: 75, F: 25)
Fish Genetic Improvement Program for Enhancement of Aquaculture Production	Mr. Angom Lenin Singh Dr. Shirinivas Jahageerdar	11-03 November 2024 Umiam	30 (M: 16, F: 14)
Modern Methods of Freshwater	Dr. Gouranga Biswas	12-14 November, 2024 Tezu	20 (M: 13, F: 07)
DNA Sequencing using Ion Torrent NGS Platform and Data Analysis	Dr. Aparna Chaudhari Dr. Annam Pavan Kumar	04-11 December 2024 ICAR-CIFE, Mumbai	10 (M: 03, F: 07)
Feed-based Scientific Fish Farming	Dr. Sikendra Kumar Dr. Tincy Varghese Dr. K. N. Mohanta	12-14 December 2024 KVK, Palghar	28 (M: 25, F: 03)
Genetically Improved Fish Species (GIFT and Jayanti Rohu/ GI Catla)	Dr. Manoj P. Brahmane Dr. Arvind Sonwane Dr. Sunil Kumar Nayak Dr. Kiran Rasal	13-14 December 2024 Junnar, Pune	127 (M: 125, F: 02)
Aquaculture Practices and Feed Management	Dr. Shamna N. Mrs. Shobha Rawat Mr. Rajeev	16-22 December 2024 ICAR-CIFE, Kakinada	07 (M: 07, F: 0)
Freshwater Fish Farming	Dr. Kapil Sukhdhane Dr. Munilkumar Sukham Dr. Madhuri Pathak Dr. Debajit Sarma	22 December 2024 Ukai	94 (M: 92, F: 02)
		Total	**1715 (M: 1212, F: 503)**

4.2 Training Programmes Organised under Scheduled Caste-Sub Plan (SCSP)

Nodal Officer: Dr. Munilkumar Sukham

ICAR-CIFE, Mumbai, conducted outreach programs under the DAPSC/SCSP scheme across various states through its regional sub-centers and partner institutions. These efforts aimed to enhance the skills and economic status of Scheduled Caste (SC) communities by providing technical training and essential resources. During the 2024 period, 63 training programs were conducted, reaching 2272 beneficiaries (1477 males and 795 females). The initiatives covered key technical areas such as freshwater aquaculture, integrated and composite fish farming, duck-cum-fish and chicken-cum-fish farming models, post-harvest processing and value addition, Vannamei shrimp farming, seaweed cultivation, ornamental fish culture, and the use of ICT in aquaculture. These programs were implemented across several states and districts including Muzaffarpur (Bihar), Datia and Jhansi (Madhya Pradesh and Uttar Pradesh), Gumla and Hazaribagh (Jharkhand), Kawardha and Mungeli (Chhattisgarh), Ludhiana and Tarn Taran (Punjab), Sambhaji Nagar (Maharashtra), Bhiwani and Rohtak (Haryana), Jalpaiguri, Kolkata, Purulia, and Bankura (West Bengal), Nellore (Andhra Pradesh), and Sonarpur (Assam). In addition to training, significant inputs were distributed to beneficiaries, including 4,18,200 fish seeds, 83.87 tonnes of fish feed, 8.74 tonnes of lime, 950 kg of micronutrients, 1,800 poultry chicks/ducklings, 15 small animals (pigs, goats, sheep), 110 pH testing kits, 100 DO testing kits, 120 nets, 20 kg of probiotics, 10 kg of feed supplements, 1,000 PIT tags, and 1,000 kg of rice bran. These provisions were critical in enabling sustainable aquaculture and livestock practices in rural SC communities.The training programmes organized under SCSP scheme during the year 2024 are listed in Table 2.

Table 2: The training programs organized under SCSP scheme during the year 2024

Title	Name of Coordinator(s)	Dates & Place	No. of Participants Total (Male, Female)
Integrated Fish Farm ing Model Duck and Desi Chicken-Cum-Fish Farming	Dr. Md. Aklakur Mr. Udipta Roy	03-09 January 2024 ICAR-CIFE, Motipur	27 (M: 27, F: 0)
Induced Breeding of Fish and Seed Production Technique	Dr. Munilkumar Sukham Dr. B. K. Behera	15-17 January 2024 Datia	25 (M: 20, F: 05)
Fish Processing and Value Addition	Dr. Munilkumar Sukham Dr. A. K. Singh	17-19 January 2024 BAU, Gumla	20 (M: 0, F: 20)
Integrated Fish Farming Model (Duck, Desi Chicken & Fish)	Dr. Md. Aklakur Mr. Udipta Roy	23-29 January 2024 ICAR-CIFE, Motipur	27 (M: 26, F: 01)
Composite Fish Culture through Scientific Methods	Dr. Munilkumar Sukham Dr. B. K. Behera	27-29 January 2024 Datia	25 (M: 20, F: 05)
Composite Fish Culture	Dr. Munilkumar Sukham Dr. A. K. Singh	27-29 January 2024 BAU, Gumla	22 (M: 11, F: 11)
Scientific Fish Farming	Dr. Munilkumar Sukham Dr. Nightingale Devi	30 January - 01 February 2024 CoF, Kawardha	30 (M: 11, F: 19)
Fish and Water Health Management	Dr. Munilkumar Sukham Dr. A. K. Singh	01-03 February 2024 BAU, Gumla	27 (M: 17, F: 10)
Vannamei Shrimp Farming Practices	Dr. Munilkumar Sukham Dr. G. Arul Oli Dr. K. S. Amirtharaj	05-07 February 2024 FCRI, Toothikudi	25 (M: 06, F: 19)
Species Diversification in Carp Polyculture	Dr. Parimal Sardar Dr. Suman Manna	08-10 February 2024 ICAR-CIFE, Kolkata	20 (M: 19, F: 01)
Scientific Fish Farming	Dr. Munilkumar Sukham Dr. Nightingale Devi	13-15 February 2024 CoF, Kawardha	30 (M: 10, F: 20)
Species Diversification in Carp Polyculture	Dr. Gouranga Biswas	15-17 February 2024 ICAR-CIFE, Kolkata	20 (M: 19, F: 01)
Open Sea Cage Culture Technology	Dr. Munilkumar Sukham Dr. G. Arul Oli	19-21 February 2024 FCRI, Toothikudi	25 (M: 20, F: 05)
Fish Farming	Dr. Munilkumar Sukham Dr. Vaneet Inder Kaur	19 February - 01 March 2024 GADVASU, Ludhiana	100 (M: 66, F: 34)
Fish Processing and Value Addition	Dr. Munilkumar Sukham Dr. A. K. Singh	21-23 February 2024 BAU, Gumla	16 (M: 0, F: 16)
Ornamental Fish Culture & Aquarium Fabrication	Dr. Munilkumar Sukham Dr. Nightinglal Devi	27-29 February 2024 CoF, Kawardha	30 (M: 19, F: 11)

Integrated Fish Farming	Dr. Munilkumar Sukham Dr. A. K. Singh	27-29 February 2024 BAU, Gumla	17 (M: 06, F: 11)
Value-Added Fish Products	Dr. Shamna N. Dr. Muralidhar P. Ande Dr. K. Syamala Dr. P. Srinivasa Rao	03-05 March 2024 ICAR-CIFE, Kakinada	10 (M: 7, F: 3)
Improved Marine Ornamental Fish Culture Techniques	Dr. Munilkumar Sukham Dr. G. Arul Oli Dr. K. S. Amirtharaj	04-06 March 2024 FCRI, Toothikudi	25 (M: 0, F: 25)
Ornamental Fish Culture and Aquarium Fabrication	Dr. Munilkumar Sukham Dr. Nightingale Devi	05-07 March 2024 CoF, Kawardha	30 (M: 30, F: 0)
Integrated Fish Farming	Dr. Munilkumar Sukham Dr. A. K. Singh	05-07 March 2024 BAU, Gumla	18 (M: 0, F: 18)
Fish Processing and Value Addition	Dr. Munilkumar Sukham Dr. A. K. Singh	13-15 March 2024 BAU, Gumla	20 (M: 0, F: 20)
Seaweed Cultivation and Value Addition	Dr. Munilkumar Sukham Dr. G. Arul Oli	13-15 March 2024 FCRI, Toothikudi	25 (M: 08, F: 17)
Magur Culture	Dr. Shamna N. Dr. Muralidhar P. Ande Dr.P. Srinivasa Rao	14-16 March 2024 ICAR-CIFE, Kakinada	15 (M: 10, F: 05)
Seed Production and Farming Technology Freshwater Prawn, *Machrobrachium Rosenbergii*	Dr. Prem Kumar	14-16 March 2024 Hazaribagh	19 (M: 13, F: 06)
Induced Breeding, Seed Production, Nursery Rearing & Management of Genetically Selected Common Carp for Inland Saline Aquaculture	Dr. Babitha Rani A. M. Dr. Mujahid K. Pathan Dr. Pankaj Kumar Dr. Sreedharan K.	14-23 March 2024 ICAR-CIFE, Rohtak	10 (M:10, F:0)
Scientific Aquaculture Practices	Dr. Munilkumar Sukham Dr. Biswarup Saha	15 March 2024 West Bengal University, Kolkata	100 (M: 96, F: 04)
Scientific Aquaculture Practices	Dr. Munilkumar Sukham Dr. Biswarup Saha	16 March 2024 South-24 Parganas	100 (M: 70, F: 30)
Fish Health Management and Disease Diagnosis	Dr. Munilkumar Sukham Dr. B. K. Behera	16-18 March 2024 Bundelkhand	25 (M: 19, F: 06)
Better Management Practices in *P. Vannamei* Farming	Dr. Shamna N.	18-20 March 2024 ICAR-CIFE, Kakinada	25 (M: 13, F: 12)
Fish and Water Health Management	Dr. Munilkumar Sukham Dr. A. K. Singh	18-20 March 2024 BAU, Gumla	20 (M: 06, F: 14)
Scientific Fish Farming Interventions	Dr. Debajit Sarma Dr. Munilkumar Sukham	18 -20 March 2024 Nagaon	100 (M: 70, F: 30)
Entrepreneurship Development in Fisheries	Dr. Munilkumar Sukham Dr. Shib Kinkar Das	19-21 March 2024 West Bengal University, Kolkata	30 (M: 30, F: 0)

Multi-Species Brackish Water Finfish Culture Models	Dr. Shamna N.	21-22 March 2024 ICAR-CIFE, Kakinada	10 (M: 07, F: 03)
Fish Pond Management	Dr. Munilkumar Sukham Dr. Pradeep Kumar Singh	22-24 March 2024 KVK, Mungeli	25 (M: 14, F: 11)
Utilization of Information Communication Technology Tools	Dr. Munilkumar Sukham Dr. Arul Oli Dr. K. S. Amirtharaj	20-22 April 2024 FCRI, Toothikudi	25 (M: 09, F: 16)
Advanced Freshwater Ornamental Fish Culture Technologies	Dr. Munilkumar Sukham Dr. Arul Oli Dr. K. S. Amirtharaj	25-27 April 2024 FCRI, Toothikudi	25 (M: 06, F: 19)
Fish Feed Production Technology for Entrepreneurship Development	Dr. Sikendra Kumar	29-31 May 2024 ICAR-CIFE, Mumbai	14 (M: 07, F: 07)
Emerging And Existing Diseases in Inland Saline Shrimp Farms	Dr. Babitha Rani A. M. Dr. Mujahid K. Pathan Dr. Pankaj Kumar Dr. Sreedharan K.	7-10 June 2024 Bhiwani	60 (M: 52, F: 08)
Seed Culture using Lined Pond-Based Semi-Biofloc Technology	Dr. Md. Aklakur Mr. Udipta Roy	21-27 June 2024 ICAR-CIFE, Motipur	30 (M: 28, F: 02)
Freshwater Pearl Farming and Fish Culture	Mrs. Sweta Pradhan	3-5 July 2024 ICAR-CIFE, Motipur	20 (M: 17, F: 3)
Modern Methods of Freshwater Aquaculture	Dr. Parimal Sardar Dr. T. K. Ghoshal	15-17 July 2024 Madarihat	20 (M: 18, F: 2)
Feed-based Species Diversified Aquaculture	Dr. Parimal Sardar Dr. Suman Manna	18-20 July 2024 Madarihat	20 (M: 1, F: 19)
Fish Farming	Dr. Gauranga Biswas	23-25 July 2024 Daspara, Jalpaiguri	20 (M: 12, F: 08)
Modern Methods of Freshwater Aquaculture	Dr. G. H. Pailan	23-25 July 2024 Jalpaiguri	20 (M: 14, F: 6)
Modern Methods of Freshwater Aquaculture	Dr. Gouranga Biswas	24-26 July 2024 Cooch Behar	20 (M: 7, F: 13)
High Value Ornamental Fish Breeding and Culture	Dr. G. Biswas Dr. P. Sardar	31 July - 2 August 2024 South 24 Parganas	20 (M: 20, F: 0)
Integrated Multi-Trophic Aquaculture (IMTA)	Dr. Prem Kumar	10-12 August 2024 Hazaribagh	60 (M: 25, F: 35)
Breeding & Seed Production of Indian Major Carps	Dr. Shamna N. Mrs. Shobha Rawat Mr. Rajeev	19-23 August 2024 ICAR-CIFE, Kakinada	20 (M: 11, F: 09)
Modern Methods of Freshwater Aquaculture	Dr. Suman Manna	28-30 August 2024 Belguma, Purulia	30 (M: 28, F: 02)

Bioinformatics	Dr. Shrinivas Jahageerdar	30 August - 03 September 2024 ICAR-CIFE, Mumbai	97 (M: 39, F: 58)
Modern Methods of Freshwater Aquaculture	Dr. Leesa Priyadarsani Dr. Hanjabam Mandakini Devi	09-11 September 2024 ICAR-CIFE, Kolkata	30 (M: 30, F: 0)
Modern Methods of Freshwater Aquaculture	Dr. T. K. Ghoshal Dr. G. Biswas	18-20 September 2024 Indas, Bankura	20 (M: 20, F: 0)
Freshwater Fish Farming	Dr. Kapil Sukhdhane Dr. Munilkumar Sukham Dr. Debajit Sarma	23 September 2024 Sambhaji Nagar	105 (M: 97, F: 08)
Modern Methods of Freshwater Aquaculture	Dr. P. Sardar Dr. Suman Manna	19-21 October 2024 South 24 Parganas	30 (M: 15, F: 15)
Breeding and Seed Production of Maha Magur, *Clarias magur*	Dr. Shamna N. Mrs. Shobha Rawat Mr. Rajeev	21-23 October 2024 ICAR-CIFE, Kakinada	21 (M: 13, F: 8)
Better Management Practices in Inland Saline Shrimp Farming	Dr. Sreedharan K.	22-24 October 2024 ICAR-CIFE, Rohtak	12 (M: 12, F: 0)
Scientific Methods of Bio Floc Fish Farming	Dr. Debajit Sarma	03 November 2024 Kalong-Kapili, Sonarpur	100 (M: 75, F: 25)
Scientific Fish Farming	Dr. Munilkumar Sukham Dr. Piverjeet Kaur Dhillon	25-29 November 2024 KVK, Tarn Tran	70 (M: 39, F: 31)
Modern Methods of Freshwater Aquaculture	Dr. Suman Manna	06-08 December 2024 ICAR-CIFE, Kolkata	50 (M: 45, F: 05)
Fish Processing and Value Addition	Dr. Munilkumar Sukham Dr. Piverjeet Kaur Dhillon	09-13 December 2024 KVK, Tarn Taran	70 (M: 39, F: 31)
BMPs in Nursery Management in *P. Vannamei* Farming	Dr. Karthireddy Syamala	11-12 December 2024 ICAR-CIFE, Kakinada	20 (M: 13, F: 07)
Integrated Aquaculture	Mrs. Shobha Rawat Dr. Muralidhar Ande	13 December 2024 Nellore	150 (M: 85, F: 65)
		Total	**2272 (M: 1477, F: 795)**

4.3 Training Programs Organised under the North-Eastern Hill (NEH) Scheme

Nodal Officer: Dr. A. K. Verma

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Title	Name of Coordinator(s)	Dates & Place	No. of Participants Total (Male, Female)
Carp Fish Breeding & Hatchery Operation	Dr. A. K. Verma Dr. S. Zeshmarani	15-19 January 2024 KVK, Thoubal	25 (M: 05, F: 20)
Integrated Aquaculture	Dr. A. K. Verma Dr. Biswajit Bal	31 January 2024 KVK, Unakoti	25 (M: 0, F: 25)
Health Management in Fish-based Integrated Farming System	Dr. Arun Sharma Mr. Dhalongsaih Reang Dr. T. I. Chanu	17-19 February 2024	40 (M: 30, F: 10)
Duck-cum-Fish Farming	Dr. A. K. Verma Dr. Arun Kumar	20 February 2024 Dhaiai, Tirpura	15 (M: 13, F: 02)
Poultry-cum-Fish Farming	Dr. A. K. Verma Dr. Arun Kumar	21 February 2024 Dhaiai, Tirpura	15 (M: 11, F: 04)
Pig-cum-Fish Farming	Dr. A. K. Verma Dr. Arun Kumar	23 February 2024 Dhaiai, Tirpura	15 (M: 12, F: 03)
Value-added Fish Product Preparation and Marketing	Dr. B. B. Nayak Dr. Layana P.	26-28 February 2024 Tinsukia and Dhemaji, Assam	30 (M: 0, F: 30)
Value-added Fish Products Preparation	Dr. A. K. Verma Dr. A. K. Balange	27-28 February 2024 Dhemaji and Lakimpur, Assam	50 (M: 0, F: 50)
Ornamental Fish Culture & Aquarium Management	Dr. A. K. Verma Dr. Biswajit Bal	06 March 2024 KVK, Unakoti	25 (M: 0, F: 25)
Integrated Fish Culture and Fish Health Management	Dr. A. K. Verma Dr. M. A. Salam	06-12 March 2024 Imphal	25 (M: 15, F: 10)
Communication Skills Among Youth of North-eastern and Hilly Regions of India	Dr. A. K. Verma Dr. Deepitha R. P.	11-13 March 2024 ICAR-CIFE, Mumbai	26 (M: 14, F: 12)
Mass Scale Production of Pure Fish Seed of Indigenous Commercially Important Minor Carp, *Labeo calbasu*, for Improving Livelihood and Nutritional Security	Dr. Debajit Sarma	11-13 March & 18-20 March 2024 Udalguri and Darrang, Assam	100 (M: 60, F: 40)
Sustainable Freshwater Aquaculture Practices for Livelihood Improvement	Dr. A. K. Verma Dr. Biswajit Bal	13 March 2024 KVK, Unakoti	25 (M: 25, F: 0)
Freshwater Pearl Culture Technology	Mrs. Sweta Pradhan	13-15 March 2024 Assam	25 (M: 17, F: 08)
Preparation of Improved Quality Traditional and Other Value-added Fish Products	Dr. H. Mandakini Devi Dr. Leesa Priyadarsani	14-16 March 2024 Imphal East, Manipur	50 (M: 16, F: 34)
Sustainable Freshwater Aquaculture Practices	Dr. A. K. Verma Dr. M. A. Salam	17 March 2024 Imphal	34 (M: 09, F: 25)
Aquaculture for Livelihood and Improving Socio- economic Status	Dr. A. K. Verma Dr. M. A. Salam	18 March 2024 Imphal	32 (M: 26, F: 06)
Modern Methods of Freshwater Aquaculture	Dr. Parimal Sardar Dr. T. K. Ghoshal	18-20 March 2024 Aizawl, Mizoram	20 (M: 11, F: 09)
Modern Methods of Freshwater Aquaculture	Dr. Suman Manna Dr. Sujata Sahoo	18-20 March 2024 Gangtok	20 (M: 011, F: 09)

Fish-based Integrated Farming System	Dr. A. K. Verma Mrs. Thongam Monika Devi	19 March 2024 KVK, South Garo Hills	25 (M: 0, F: 25)
Integrated Fish Culture & Fish Health Management	Dr. A. K. Verma Dr. Biswajit Bal	20 March 2024 KVK, Unakoti	25 (M: 25, F: 0)
Enhancement of Fish Productivity through Farmer Participatory Research	Dr. A. K. Verma Dr. M. A. Salam	22 March 2024 Imphal	26 (M: 05, F: 21)
Enhancement of Fish Productivity through Farmer Participatory Research	Dr. A. K. Verma Dr. M. A. Salam	23 March 2024 Imphal	31 (M: 22, F: 09)
Sustainable Freshwater Aquaculture Practices	Dr. A. K. Verma Dr. M. A. Salam	24 March 2024 Imphal	35 (M: 9, F: 26)
Carp Fish Breeding and Hatchery Operations	Dr. A. K. Verma Dr. M. A. Salam	25-27 March 2024 Imphal	27 (M: 09, F: 18)
Fish Processing and Value-added Fish Products	Dr. A. K. Verma Dr. M. A. Salam	26-28 March 2024 Imphal	25 (M: 0, F: 25)
Carp Fish Breeding and Hatchery Operations	Dr. A. K. Verma Dr. M. A. Salam	28-30 March 2024 Imphal	25 (M: 01, F: 24)
Aquaculture for Livelihood and Improving Socio- economic Status	Dr. A. K. Verma Dr. M. A. Salam	March 31 2024 Imphal	39 (M: 26, F: 13)
Aquarium Fabrication & Ornamental Fish Keeping for Entrepreneurship Development	Dr. A. K. Verma Dr. A. K. Balange	03-05 April 2024 Dhemaji and Lakimpur, Assam	27 (M: 21, F: 06)
Carp Fish Seed Production using the Portable Hatchery	Dr. A. K. Verma Dr. Deepanjali Deori	26-28 June 2024 Lower Dibang Valley	20 (M: 16, F: 04)
Freshwater Pearl Culture Technology	Mrs. Sweta Pradhan	26-28 June 2024 Bechamari, Assam	10 (M: 01, F: 09)
Modern Methods of Freshwater Aquaculture	Dr. D. K. Singh Dr. G. Biswas	26-28 June 2024 Lower Dibang Valley	20 (M: 16, F: 04)
Modern Methods of Freshwater Aquaculture	Dr. T. K. Ghoshal Dr. Parimal Sardar	03-05 September 2024 Aizawl, Mizoram	20 (M: 18, F: 02)
Fish Farming & Distributing Carp Seeds	Dr. Suman Manna Mrs. Sweta Pradhan	29 September - 01 October 2024 West Sikkim	20 (M: 15, F: 05)
Prawn/fish Pickles Preparation, Packaging and Quality Control	Dr. H. Mandakini Devi Dr. Leesa Priyadarsani	26-30 October 2024 Manipur	50 (M: 06, F: 44)
Modern Methods of Freshwater Aquaculture	Dr. T. K. Ghoshal Dr. Suman Manna	7-9 November, 2024 Sipahijala, Tripura	20 (M: 6, F: 14)
Modern Methods of Freshwater Aquaculture	Dr. Sujata Sahoo & Dr. Suman Manna	12-14 November 2024 Ri-Bhoi, Meghalaya	20 (M: 11, F: 09)
Modern Methods of Freshwater Aquaculture	Dr. G. H. Pailan Dr. D. K. Singh	27-29 November 2024 Dibrugarh, Assam	20 (M: 16, F: 04)
		Total	**1082** **(M: 498, F: 584)**

4.4 Skill Development Programmes (SDPs)

4.4.1 Skill Development Programmes (SDPs) / Refreshers Course / Online Courses

Title	Name of Coordinator(s)	Date/Duration Place	No. of Participants Total (Male, Female)
Aquaculture Division			
Ornamental Fish Culture and Aquarium Management	Dr. Paramita Banerjee Sawant Dr. Upasana Sahoo Dr. Debajit Sarma	18-25 August 2024 Mumbai	15 (M: 15, F: 0)
		Total	**15 (M: 15, F: 0)**
Aquatic Environment & Health Management Division			
Technical Know-how for *Spirulina* Biomass Production and Utilization	Dr. S. P. Shukla Dr. Saurav Kumar Dr. Kundan Kumar	15-20 January 2024 Mumbai	14 (M: 13, F: 1)
Technical Know-how for *Spirulina* Biomass Production and Utilization	Dr. S. P. Shukla Dr. Saurav Kumar Dr. Kundan Kumar	05-10 February 2024 Mumbai	19 (M: 15, F: 4)
PCR Based Disease Diagnosis	Dr. Megha Kadam Bedekar Dr. Jeena K.	5-7 November 2024 Mumbai	15 (M: 11, F: 4)
The Application of CRISPR-Cas Mediated Genome Editing for Vaccines and Diagnostics	Dr. Megha Bedekar	02-06 December 2024 Mumbai	12 (M: 10, F: 2)
		Total	**60 (M: 49, F: 11)**
Fisheries Economics, Extension and Statistics Division			
Preparation of Organic Manure from Fish Waste	Dr. Arpita Sharma	29 January 2024 Nagpur	40 (M: 30, F: 10)
Preparation of Organic Manure from Fish Waste for Fish Retailers and Wholesalers	Dr. Swadesh Prakash Dr. Arpita Sharma	04 March 2024 New Delhi	27 (M: 25, F: 02)
Digital Payment Transactions on Various Platforms for Enabling Clean Business & Preparation of Organic Manure from Fish Waste for Retailers and Wholesalers	Dr. Arpita Sharma Dr. Vidya Shree Bharati Dr. Prem Kumar	07 March 2024 Fish Market, Khar Danda	27 (M: 02, F: 25)
		08 March 2024 Fish Market, Worli	106 (M: 05, F: 101)
Shrimp Crop Insurance and Loss Assessment	Dr. Ananthan P. S. Dr. Munilkumar Sukham Dr. Shivaji Argade	29 April - 03 May 2024 Mumbai	22 (M: 17, F: 05)
Advancing Understanding of Fisheries Economics for Tomorrow's Leaders (Online)	Dr. Swadesh Prakash Dr. Vinod Kumar Yadav Dr. Arpita Sharma	24-28 June 2024 Mumbai	10 (M: 07, F: 03)
Computer Vision in Fisheries Using Machine Learning (Online)	Dr. Vinod Kumar Yadav Dr. Arpita Sharma	08-13 July 2024 Mumbai	12 (M: 07, F: 05)

Aqua Business Models for Promoting Aquapreneurship	Dr. Shivaji Argade Dr. Ananthan P. S. Dr. Ankush Kamble Dr. Arpita Sharma	05-09 August 2024 Mumbai	17 (M: 17, F: 0)
Aqua Business Models for Promoting Aquapreneurship	Dr. Shivaji Argade Dr. Ananthan P. S. Dr. Ankush Kamble Dr. Arpita Sharma	17-21 August 2024 Mumbai	15 (M: 15, F: 0)
		Total	**276 (M: 125, F: 151)**

Fisheries Resources, Harvest and Post-Harvest Management Division

Communication Skills for Youth of North Eastern and Hilly (NEH) Regions of India	Mr. Iburahim. S. Dr. Deepitha R. P. Dr. Manish Jayant Dr. Kapil Sukdhane Dr. Arpita Sharma	11-13 March 2024 Mumbai	30 (M: 15, F: 15)
Fish Processing and Value-added Fish Products	Dr. Layana P. Mr. Avinash Sable	13-22 August 2024 Mumbai	30 (M: 0, F: 30)
Fish Processing and Value-added Fish Products	Dr. Layana P. Mr. Avinash Sable	28 August - 04 September 2024 Mumbai	30 (M: 0, F: 30)
		Total	**90 (M: 15 F: 66)**

Fisheries Genetics & Biotechnology Division

Real-Time PCR and Applications	Dr. Mukunda Goswami Dr. Arvind Sonwane Dr. Kiran Rasal	23-25 January 2024 Mumbai	56 (M: 22, F: 34)
Microinjection and Gene Editing Techniques in Zebrafish	Dr. Mukunda Goswami Dr. Arvind Sonwane Dr. Kiran Rasal	21-30 May 2024 Mumbai	01 (M: 0, F: 01)
		Total	**57 (M:22, F: 35)**

Fish Nutrition, Biochemistry and Physiology Division			
Aquafeed Production Technology and Feeding Management for Freshwater Aquaculture	Dr. Sikendra Kumar Dr. Manish Jayant	4-8 March 2024 Mumbai	25 (M:25, F: 0)
Fish and Shrimp Feed Production Technology for Enhancing Aquaculture Production	Dr. Sikendra Kumar Dr. Manish Jayant	26-30 August 2024 Mumbai	22 (M:22, F: 0)
Nutrition and Feed Management in Aquaculture Pond Practices	Dr. Sikendra Kumar Dr. Manish Jayant	9-13 September 2024 Mumbai	20 (M: 15, F: 5)
Nutrition and Feed Management in Aquaculture Pond Practices	Dr. Sikendra Kumar Dr. Manish Jayant	26-30 September 2024 Mumbai	20 (M: 15, F: 5)
		Total	**87 (M:77, F: 10)**

ICAR-CIFE, Kolkata Centre			
Techniques of Aquaculture and Different Management Practices	Dr. T. K. Ghoshal	09 January - 07 February 2024	03 (M: 03, F: 0) Bihar
Mithe Pani Me Machli Palan	Dr. Suman Manna	11-17 January 2024	20 (M: 20, F: 0) Darbhanga, Bihar
Mithe Pani Me Machli Palan	Dr. Sujata Sahoo	23-29 January 2024 Madhepura, Bihar	20 (M: 20, F: 0)
Mithe Pani Me Machli Palan	Dr. L. Priyadarsani	13-19 February 2024 Bhagalpur, Bihar	20 (M:20, F: 0)
Mithe Pani Me Machli Palan	Dr. H. Mandakini Devi	28 February - 05 March 2024 Bhojpur, Bihar	20 (M: 20, F: 0)
Mithe Pani Me Machli Palan	Dr. G. H. Pailan	06-12 March 2024 Khagaria, Bihar	20 (M: 20, F: 0)
Promotion of Scientific Aquaculture Practices in Sundarban	Dr. T. K. Ghoshal	20-21 March 2024 Sundarban, West Bengal	29 (M: 23, F: 06)
Post-harvest Management in Brackish Water Aquaculture	Dr. H. Mandakini Devi	29 April - 01 May 2024 Sundarban, West Bengal	13 (M: 13, F: 0)
Student Ready Programme	Dr. T. K. Ghoshal	06-20 May 2024 Ranchi, Jharkhand	24 (M: 13, F: 11)
Advances in Aquaculture Practices	Dr. G. Biswas Dr. P. Sardar	04-10 June 2024 West Bengal	45 (M: 32, F: 13)
Mithe Pani Me Machli Palan	Dr. P. Sardar Mrs. Sweta Pradhan	20-26 August 2024 East Champaran, Bihar	30 (M: 30, F: 0)
Mithe Pani Me Machli Palan	Dr. G. H. Pailan Dr. D. K. Singh	03-09 September 2024 Sheohar, Bihar	30 (M: 30, F: 0)
Management of Soil, Water and Fish Diseases in Aquaculture	Dr. Suman Manna, Dr. Leesa Priyadarsani Dr. H. Mandakini Devi	17-23 September 2024 Bihar	42 (M: 25, F: 17)

Mithe Pani Me Machli Palan	Dr. Suman Manna Dr. G. Biswas	17-23 September 2024 Saran, Bihar	30 (M: 30, F: 0)
Mithe Pani Me Machli Palan	Dr. Sujata Sahoo, Dr. T. K. Ghoshal	15-21 October 2024 Madhepura, Bihar	30 (M: 30, F: 0)
Mithe Pani Me Machli Palan	Dr. G. Biswas, Dr. Suman Manna	22-28 October 2024 Katihar, Bihar	30 (M: 30, F: 0)
Methods of Freshwater Aquaculture	Mrs. Sweta Pradhan	04-08 November 2024 Angul, Dhenkanal & Jajpur, Odisha	30 (M: 30, F: 0)
Methods of Freshwater Aquaculture	Mrs. Sweta Pradhan	11-15 November 2024 Odisha	30 (M: 17, F: 13)
Fish Processing and Value-Added Fish Products	Dr. H. Mandakini Devi Dr. Sujata Sahoo, Dr. D. K. Singh	19-25 November 2024 Bihar, West Bengal	27 (M: 18, F: 09)
Mithe Pani Me Machli Palan	Dr. D. K. Singh, Dr. P. Sardar	19-25 November 2024 Bhagalpur, Bihar	30 (M: 30, F: 0)
Freshwater Pearl Farming	Mrs. Sweta Pradhan Dr. Suman Manna	02-06 December 2024 West Bengal, Bihar, Gujarat	15 (M: 09, F: 06)
Mithe Pani Me Machli Palan	Dr. Parimal Sardar Dr. H. Mandakini Devi	03-09 December 2024 Banka, Bihar	30 (M: 30, F: 0)
Fish Nutrition and Feeding Strategies	Dr. Parimal Sardar Dr. D. K. Singh	10-16 December 2024 Bihar & West Bengal	30 (M: 16, F: 14)
Mithe Pani Me Machli Palan	Dr. T. K. Ghoshal Dr. G. Biswas	11-17 December 2024 Munger, Bihar	30 (M: 30, F: 0)
Farm-made Aqua Feed Formulation and On-farm Feeding Management	Dr. T. K. Ghoshal Dr. G. H. Pailan	18-24 December 2024 West Bengal & Mizoram	21 (M: 18, F: 03)
Mithe Pani Me Machli Palan	Mrs. Sweta Pradhan Dr. G. H. Pailan	18-24 December 2024 Araria, Bihar	30 (M: 30, F: 0)
		Total	**679 (M: 587, F:92)**

ICAR-CIFE Powarkheda Centre

Matsya Evam Jhinga Palan Ki Aadhunik Vidhiyan	Dr. Sunil K. Nayak Mr. Dhalongsaih Reang Dr. Harsha Haridas Mr. Hasan Javed	03-09 January 2024 Kaimur, Bihar	15 (M: 15, F: 0)
Matsya Evam Jhinga Palan Ki Aadhunik Vidhiyan	Dr. Sunil K. Nayak Mr. Dhalongsaih Reang Dr. Harsha Haridas Mr. Hasan Javed	14-20 February 2024 Baxar, Bihar	13 (M: 13, F: 0)
Tagging of Catfish and Carp using PIT Tag	Dr. Sunil K. Nayak Mr. Dhalongsaih Reang	02-03 March 2024	12 (M: 12, F: 0)
Matsya Evam Jhinga Palan Ki Aadhunik Vidhiyan	Dr. Sunil K. Nayak Shri Dhalongsaih Reang, Dr. Harsha Haridas, Shri Hasan Javed	12-18 June 2024 District: Munger State: Bihar	14 (M: 14, F: 0)

Carp Hatchery Management	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas Mr. Hasan Javed	22-26 July 2024 MP, Maharashtra, UP	06 (M: 06, F: 0)
Carp Culture Practices and Recent	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas Mr. Hasan Javed	19-23 August 2024 MP, Maharashtra	15 (M: 14, F: 01)
Matsya Evam Jhinga Palan Ki Aadhunik Vidhiyan	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas Mr. Hasan Javed	03-09 October 2024 Samastipur, Kishanganj & Hajipur Bihar	43 (M: 39, F: 4)
Matsya Evam Jhinga Palan Ki Aadhunik Vidhiyan	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas Mr. Hasan Javed	20-26 November 2024 Banka, Bihar	15 (M: 15, F: 0)
		Total	**133 (M:128, F:5)**

ICAR-CIFE Rohtak Centre			
Induced Breeding, Seed Production, Nursery Rearing, and Management of Genetically Selected Common Carp for Inland Saline Aquaculture	Dr. Mujahidkhan A. Pathan	14-23 March 2024 Rohtak, Haryana	15 (M: 15, F: 00)
Standard Operating Protocol for Emerging Fish Species in Biofloc Culture System	Dr. Babitha Rani A.M. Dr. Sreedharan K. Dr. Upasana Sahoo	29-31 August 2024 Rohtak, Haryana	17 (M: 16, F: 01)
Standard Operating Protocol for Emerging Fish Species in Biofloc Culture System	Dr. Babitha Rani A.M. Dr. Sreedharan K. Dr. Upasana Sahoo	1-3 September 2024 Rohtak, Haryana	12 (M: 11, F: 01)
		Total	**44 (M:42, F:02)**

ICAR-CIFE, Kakinada Centre			
Fish and Prawn Culture	Dr. Muralidhar P. Ande Dr. K. Syamala Dr. Shamna N. Mrs. M. Usha Rani	02-08 February 2024 Madhubani, Bihar	25 (M: 25, F: 0)
Alternative Species for Bracishwater Aquaculture	Dr. Muralidhar P. Ande Dr. K. Syamala Dr. Shamna N. Mrs. M. Usha Rani	26 February - 01 March 2024 Andhra Pradesh	20 (M: 14, F: 06)
Fish and Prawn Culture	Dr. Muralidhar P. Ande Dr. K. Syamala Dr. Shamna N. Mrs. M. Usha Rani	14-20 March 2024 East Champaran, Bihar	24 (M: 24, F: 0)
Fish and Prawn Culture	Dr. Muralidhar P. Ande Dr. K. Syamala Dr. Shamna N. Mrs. M. Usha Rani	15-21 May 2024 Purmea, Bihar	25 (M: 25, F: 0)
Ornamental Fish Culture Potential and Opportunities	Dr. Shamna N. Mrs. Shobha Rawat. Dr. Muralidhar P. Ande Dr. K. Syamala	19-21 June 2024 East Godavari, Andhra Pradesh	04 (M: 03, F: 01)
Seed Production and Larval Rearing of Carps	Dr. Shamna N. Mrs. Shobha Rawat. Dr. Muralidhar P. Ande Dr. K. Syamala	01-05 July 2024 Maharashtra, Tamil Nadu, East Godavari District, Vishakhapatnam	04 (M: 04, F: 0)
Fish and Prawn Culture	Dr. Muralidhar P. Ande Dr. K. Syamala Dr. Shamna N. Mrs. M. Usha Rani	02-08 July 2024 Begusarai, Bihar	25 (M: 25, F: 0)
Breeding and Seed production of IMCs	Dr. Shamna N. Mrs. Shobha Rawat	19-23 August 2024 Vishakhapatnam, Eluru, West Godavari District, East Godavari District, Andhra Pradesh	19 (M: 13, F: 06)
Better Management Practices for Shrimp Farming	Dr. Muralidhar P. Ande Dr. K. Syamala Mrs. M. Usha Rani	23-27 September 2024 Andhra Pradesh	16 (M: 11, F: 05)
Breeding and Seed production of Maha Magur, *Clarias magur*	Dr. Shamna N. Mrs. Shobha Rawat Mr. Rajiv	21-23 October 2024 Kakinada, Eluru, West Godavari District, East Godavari District, Andhra Pradesh	18 (M: 12, F: 06)
Backyard Biofloc Systems for Shrimp Culture	Dr. K. Syamala Dr. Muralidhar P. Ande	09-13 December 2024 Andhra Pradesh and Gujarat	05 (M: 04, F: 01)
		Total	**185 (M: 166, F: 19)**

ICAR-CIFE Motipur Centre			
Aquaculture Enterprise Management	Dr. MD. Aklakur Mr. Udipta Roy	20 June - 20 July 2024 Bihar	13 (M: 09, F: 04)
Aquaculture Enterprise Management	Mr. Udipta Roy Dr. MD. Aklakur	21 October - 20 January 2025 Bihar	11 (M: 06, F: 05)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	02- 07 September 2024 Muzaffarpur, Bihar	25 (M: 22, F: 03)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	09-14 September 2024 Sitamarhi, Bihar	27 (M: 25, F: 02)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	23-28 September 2024 East Champaran, Bihar	28 (M: 25, F: 03)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	30 September – 05 October 2024 West Champaran, Bihar	25 (M: 25, F: 0)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	14-19 October 2024 Vaishali, Bihar	25 (M: 25, F: 0)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	21-26 October 2024 Sheohar, Bihar	29 (M: 18, F: 11)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	11-16 November 2024 Saran, Bihar	25 (M: 25, F: 0)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	18-23 November 2024 Samastipur, Bihar	26 (M: 26, F: 0)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	25-30 November 2024 Siwan, Bihar	25 (M: 25, F: 0)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	02-07 December 2024 Darbhanga, Bihar	25 (M: 19, F: 06)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	09-14 December 2024 Madhubani, Bihar	25 (M: 24, F: 01)
Aadhunik Meetha Jal Matsya Palan Aur Prabandhan	Dr. MD. Aklakur Mr. Udipta Roy	16-21 December 2024 Gopalganj, Bihar	25 (M: 25, F: 0)
		Total	**334 (M: 299, F: 35)**
		Grand Total	**1970 (M: 1531, F: 439)**

4.4.2 Trainings Conducted under the Central "Next Generation Sequencing (NGS)" Lab

Course Director: Dr. Aparna Chaudhari

Course Coordinators: Dr. Annam Pavan Kumar, Dr. Kiran D. Rasal

The Central NGS Lab of the institute has organized a total of three training programmes, sponsored by ICAR, the Tribal Sub-Plan (TSP), and through paid training. The details of these training programmes are provided below.

Title	Funding	Duration	No. of Participants Total (Male, Female)
Hands-on Training on DNA Sequencing Using Ion Torrent NGS Platform and Data Analysis	ICAR	22–31 January 2024	20 (M: 12; F: 8)
Hands-on Training on DNA Sequencing Using Ion Torrent NGS Platform and Data Analysis	Tribal Sub-Plan	4–11 December 2024	10 (M: 6; F: 4)
Hands-on Training on DNA Sequencing Using Ion Torrent NGS Platform and Data Analysis	Paid Training	4–11 December 2024	10 (M: 3; F: 7)
		Total	**60 (M:21; F:19)**

4.4.3 Special Training Organised

Title	Name of Coordinators	Duration	No. of Participants Total (Male, Female)
In-Plant Training of BFSc Students, CoF, Sasaram	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas Mr. Hasan Javed	14 August – 13 September 2024	19 (M: 15, F: 04) Bihar
In-Plant Training of BFSc Students, CoF, Nagpur	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas Mr. Hasan Javed	17 September – 30 November 2024	10 (M: 06, F: 04) Maharashtra
Exposure-Cum-Inplant Training of BFSc Students, CoF, Dholi	Dr. Muralidhar P. Ande Dr. K. Syamala Mrs. M. Usha Rani	03-09 October 2024	37 (M: 23, F: 14) Dholi, Bihar
		Total	**66 (M: 44, F: 22)**

4.5 Workshops, Seminars, Farmer Meets, etc. Organised

Title	Name of Coordinators	Date and Place	No. of Participants Total (Male, Female)
National Seminar on Seafood Safety & Public Health	Dr. Sanath Kumar H. Dr. Manjusha L, Dr. Nayak B.B	04-05 January 2024	60 (M:40, F:20)
Sensitization Workshop for Students of Agricultural Universities to Experience Virtual Reality Modules	Mr. Abuthagir Iburahim S. Dr. Anandhan P. S.	15-19 January 2024 Mumbai	100 (M: 30, F: 70)
Agricultural Drone Demonstration	Dr. Shivaji Argade Dr. Ananthan P. S.	17 January 2024 Mumbai	61 (M: 40, F: 21)
Interactive Session with Fish Sellers Association, Nagpur	Dr. Arpita Sharma	January 29 2024	08 (M: 08, F: 0)
Aquapreneurship Development Program - COHORT-One	ABI Team	30-31 May 2024 ICAR-CIFE, Mumbai	162 (M: 130, F: 32)
National Fish Farmers Day - 2024	ICAR-CIFE, Kolkata	10 July 2024	120 (M: 90, F: 30)
Carp Breeding and Seed Production	Dr. Shamna N. Mrs. Shobha Rawat	10 July 2024 Balbhadrapuram	50 (M: 05, F: 45)
National Fish Farmers Day & Farmers Meet - 2024	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas Mr. Hasan Javed	25 July 2024 Powarkheda	30 (M: 26, F: 04)
Input Distribution Event for Fishers of 'Vesava Macchimar Vividh Karyakari Sahakari Society Limited, Versova, Mumbai	Dr. Arpita Sharma Dr. Swadesh Prakash	11 August 2024	36 (M: 08, F: 28)
Fish Health Management and Culture of Improved Fish Varieties	Dr. Gayatri Tripathi Dr. Jeena K. Dr. Saloni Shivam Mrs. R. Bharthi Rathinam	31 August 2024 Nira, Pune	37 (M: 30, F: 7)
Harnessing Modern Tools for Smarter Documentation	Dr. Gayatri Tripathi Dr. Saloni Shivam Mr. Abuthagir Iburahim, Mrs. R. Bharathi Rathinam Mr. Subhash Chand Mr. Md. Baqar	23 September 2024 ICAR-CIFE, Mumbai	120 (M: 40, F: 80)
AGRI UDAAN® 7.0 Roadshow/Startup Hunt event	ABI Team	September 24 2024 ICAR-CIFE, Mumbai	85 (M:50, F: 35)
First Episode of Mahine ke Antim Brahispatiwar, Mann Ki Baat Matsya Kisan ke Sath: Prospects of Aquaculture in Bihar and Jharkhand: The Role of ICAR-CIFE In Enhancing Production	Dr. MD. Aklakur Mr. Udipta Roy Dr. Arpita Sharma	26 September 2024	Offline: 63 (M: 63, F: 0) Online: 60 (M: 40, F: 20)
Kisan Diwas - Wealth from Waste	Dr. T. K. Ghoshal	01 October 2024	120 (M: 90, F: 30)
Kisan Diwas - Wealth from Waste	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas Mr. Hasan Javed	01 October 2024 Powarkheda	65 (M: 6, F: 60)
Outreach to Strengthen Maharashtra's Marine Fishery	Dr. Mahesh Kadam Dr. Amit Borkar Dr. Shivaji Argade	11-13 October 2024 Mumbai	400 (M:150, F: 250)

Cooperatives (VAMNICOM, Pune and ICAR-CIFE, Mumbai)			
Startup India Registration & Benefits to Entrepreneurs	ABI Team	13 November 2024 Mumbai	13 (M: 10, F: 03)
Second Episode of Mahine ke Antim Brahispatiwar, Mann Ki Baat Matsya Kisan ke Sath: Biofloc and RAS: An Intensified Aquaculture Model for Bihar and Jharkhand	Dr. MD. Aklakur Mr. Udipta Roy Dr. Arpita Sharma	28 November 2024	Offline: 35 (M: 35, F: 0) Online: 56 (M: 36, F: 20)
Third Episode of Mahine ke Antim Brahispatiwar, Mann Ki Baat Matsya Kisan ke Sath: Production of Nutritionally Balanced Feed and its Use for Enhancing Aquaculture Production	Fish Nutrition, Biochemistry and Physiology Division	28 November 2024 Mumbai	155 (M: 100, F: 55)
Awareness and Field Demonstration Programme on Integrated Aquaculture	Mrs. Shobha Rawat Dr. Shamna N. Dr. Muralidhar P. Ande Dr. S. Jahageerdar	13 December 2024 Andhra Pradesh	150 (M: 85, F: 65)
Agri Drone Demonstration	Dr. Ananthan P. S. Mr. Abuthagir Iburahim S.	13-15 December Ratnagiri	90 (M: 55, F: 35)
Company Registration & the Benefits Available to Budding Entrepreneurs/Startups	ABI Team	16 December 2024 Mumbai	13 (M: 10, F: 03)
Kisan Diwas - Waste to Wealth	Dr. Suman Manna	23 December 2024	40 (M: 25, F: 15)
Fourth Episode of Mahine ke Antim Brahispatiwar, Mann Ki Baat Matsya Kisan ke Sath Feeding Management and Its Importance in Enhancing Productivity	Dr. MD. Aklakur Mr. Udipta Roy Dr. Arpita Sharma	26 December 2024	Offline: 45 (M: 45, F: 0) Online: 60 (M: 45, F: 15)
Fish Health Management	Dr. Megha K. Bedekar Dr. Arun Sharma Dr. Saurav Kumar Dr. Jeena K.	30 December 2024 Pen, Raigad	70 (M: 61, F: 9)
		Total	**2244 (M: 1312 , F: 932)**

4.6 Fisheries Advisory Services

Dr. Madhuri Pathak

- Mentorship is being provided for one startup group, Raftech Solutions Pvt Ltd through Agri-Business Incubation centre at ICAR CIFE, Mumbai from 02.09.2024 to 02.09.2025 for seaweed cultivation and utilization through Biostimulant preparation.
- Mentorship is being provided to an incubate, Mr. Rakesh Jadhav, through Agri-Business Incubation centre at ICAR CIFE, Mumbai, from 30.09.2024 to 30.09.2025 for seaweed cultivation.

Dr. Paramita Banerjee Sawant

- Mentor for Ornamental Fish Culture and Entrepreneurship Development for two incubate startups, M/S Shree Aquaculture and M/S Atharva Aquaculture, under Agri Business Incubation Unit (ABI) of ICAR-CIFE Mumbai.
- Provided fishery advisory services to Startups, Entrepreneurs, and hobbyists as a nominated expert on ornamental fish during the National Stakeholder Consultation on Ornamental Fish at ICAR-CIFA on 1-2 August 2024.
- Co-PI/ Member of the Kisan Sarathi 2.0 Team from Fisheries for country-wide implementation of the *"Kisan Sarathi:e-nidanshala"* program of Govt. of India, in association with ICAR-IASRI, prepared factual answer series on the subject of Aquaculture.
- Technology transfer of fish feed "CIFELOACH" specific for the ornamental demersal browser Botia striata to Maharashtra Aqua Farmers' Association, Mumbai during April 2024.

Dr. Debajit Sarma

- Provided consultancy to Agrocel Industries Pvt. Ltd., Gujrat, for performance evaluation of AQUALAABH in shrimp and fin fish farming.

Name	Date	Topic	Type of support
T. Shrinu	August 12 2024	Grass carp breeding	Technical guidance
Aravind	August 21 2024	Magur culture	Technical guidance
P. Phanindra	September 23 2024	Ornamental culture	Technical guidance
P. Venkatesh	October 21 2024	Bacterial disease & treatments	Technical guidance
KVVD Srinivasalu	November 29 2024	Murrel culture in cement tanks	Technical guidance
K. Raju	December 21 2024	Feed management in fish & shrimp culture	Technical guidance

4.7 TV Talks/ Radio talks/ YouTube videos/ Print Media

4.7.1 TV Talk / Radio Talk / YouTube Videos, etc.

Name of Faculty	Topic Delivered	Date	Language	Programme	Broadcasted on
Dr. T. K. Ghoshal	Role of ICAR-CIFE in Fisheries Education	17 January 2024	Bengali	Agriculture & Rural Broadcast	DD Bangla
Dr. Kapil Sukhdhane	Education and employment opportunities in aquaculture sector	01 April 2024	Marathi	Amchi Mati Amchi Mansa	Doordarshan Sahyadri
Dr. Babitha Rani A. M.	Saline water aquaculture	05 April 2024	Hindi	Vichaar Vimarsh	DD Kisan
Dr. Prem Kumar	Culture of shrimp in saline water	12 April 2024	Hindi	Live Programme	DD Kisan
Dr. Sukham Monalisha Devi	Fish Culture Practices and other related employment scopes	10 June 2024	Manipuri	Farm and Home	Akashvani, Imphal
Dr. Sukham Monalisha Devi	Career Opportunities in Fisheries Science	26 June 2024	Manipuri	Youth Program	Akashvani, Imphal
Dr. Arpita Sharma	Commercial Utilisation of Fish Waste in Urban Fish Markets	16 July 2024	Hindi	Swacchta Action Plan	CIFE, YouTube Channel
Mr. Abuthagir Iburahim S. Dr. B. B. Nayak Dr. Asha Landge Mr. Ashpel Mano	Jellyfish Sting? Here's How to Treat It!	1 August 2024	English	Facts	CIFE Youtube Channel
Mr. Abuthagir Iburahim S.	International Whale Shark Day	1 August 2024	English	Facts	CIFE Youtube Channel
Dr. T. K. Ghoshal	Mach Chashe Sarkari Sujog o Sambhanbana	12 August 2024	Bengali	Krishi Kathar Asar	All India Radio, Kolkata
Dr. Kapil Sukhdhane	Education and Employment Opportunities in Fisheries	21 August 2024	Marathi	DD Shayadri	Krishidarshan
Dr. Debajit Sarma	Modern Technology for the development of fisheries in Assam	28 September 2024	Assamese	Krishi Darshan	DD Kisan
Dr. Madhuri Pathak	Ornamental fish rearing	10 October 2024	Marathi	Krishidarshan	Doordarshan Sahyadri
Dr. Prem Kumar	Fish farming	18 October 2024	Hindi	Live Programme	DD Kisan

Dr. Upasana Sahoo	Marine life, fishery, flora and fauna in Odisha and its effect on culture, life of common man in Odisha. Part I	03 November 2024	Hindi	Ek Bharat Shreshth Bharat	All India Radio
Dr. Upasana Sahoo	Marine life, fishery, flora and fauna in Odisha and its effect on culture, life of common man in Odisha. Part II	10 November 2024	Hindi	Ek Bharat Shreshth Bharat	All India Radio
Dr. T. K. Ghoshal Dr. G. Biswas	Breeding and culture of tengra fish	22 November 2024	Bengali	Krishidarshan	DD Bangla
Dr. Shivaji Argade	Fish farming success story	27 December 2024	Marathi	Amchi Mati Amchi Mansa	Doordarshan Sahyadri

4.7.2 Print Media

Title (Headline of the News Article)	Date	Name of Newspaper	Language
Machher Jonyo Udyog	28 February 2024	Uttar Banga Sambad	Bengali
Vividha rakala vantala pai sikshana	05 March 2024	Eenadu	Telugu
Acqua rangam lo swayam vupadhi	17 March 2024	Eenadu	Telugu
केंद्रीय मात्स्यिकी शिक्षण संस्थेचा पदवी प्रदान समारंभ	04 April 2024	लोकसत्ता	
केंद्रीय मात्स्यिकी शिक्षा संस्थान में दीक्षांत समारोह का आयोजन भारत मछली उत्पादक का दूसरा सबसे बड़ा देश	06 April 2024	नवभारत	
तेज धूप गर्मी में ये काम ज़रूर करें मछली किसान, नुकसान से बचने के लिए पढ़ें विशेषज्ञ के राय	02 May 2024	Kishan Talk	Hindi
मछली पालन और अपार संभावनाएँ प्रशिक्षण लेकर आत्मनिर्भर बनें	23 June 2024	Dainik Bhaskar	Hindi
Carp fish seed successfully produced in portable hatchery	28 June 2024	The Arunachal Times	English
Carp seed production using portable hatchery for the first time at Lower Dibang Valley, Arunachal Pradesh	28 June 2024	ICAR-News	English
मछली पालन विधि का जानकारी	29 June 2024	Dainik bhaskar	Hindi
National Fish Farmers Day celebrated	10 July 2024	ICAR-News	English
Karyakalapala vistaranaku krushi	11 July 2024	Eenadu	Telugu
Machh Chasher Prashikshan	24 July 2024	Uttar Banga Sambad	Bengali
Matsya Chashier Prashikshan Shibir Jalpaigurite	24 July 2024	Sangbad Pratidin	Bengali
Jiranpure Matsyachashider Prashikhshan	26 July 2024	Bartaman	Bengali
Machhchasher Prashikshan	26 July 2024	Uttar Banga Sambad	Bengali
Pilot Scale activity on Species Diversification in Carp Polyculture	26 July 2024	ICAR-News	English
कृषि प्रबंधन और प्रशिक्षण संस्था के ओर से प्रायोजित प्रशिक्षणों की श्रृंखला का चौथा प्रशिक्षण	26 July 2024	Dainik Bhaskar	Hindi
Adhunik Matsyachash Shikhe Nilen Chashira	28 July 2024	Aajkal	Bengali
Ghanamga Jatheeya Matsya rythula dinothsvam	31 July 2024	Sakshi	Telugu
Matsya Palan Kae sath Mkhana vo Singhara ki bhi higi Kheti	11 August 2024	Jagaran	Hindi
Matsya Palan ke Visaye mae di Jankari	11 August 2024	Bhaskar News	Hindi
Katakmasandi kae Mitha Halab mae pahlibar Hogi Moti ki Kheti	11 August 2024	Pratinidhi	Hindi

উত্তরবঙ্গ সংবাদ

মাছ চাষের প্রশিক্ষণ

দেওয়ানহাট, ২৬ জুলাই : ক্ষুদ্র ও প্রান্তিক মাছচাষিদের স্বনির্ভরতা ও আর্থসামাজিক উন্নয়নের উদ্দেশ্যে কোচবিহার-১ ব্লকের জিরানপুরে ২০ জন তপশিলি চাষিকে নিয়ে তিনদিনব্যাপী হাতে-কলমে মাছ চাষের প্রশিক্ষণ শিবির শুক্রবার শেষ হল। কেন্দ্রীয় মৎস্য শিক্ষাসংস্থানের উদ্যোগে ও জিরানপুর ফার্মার্স প্রোডিউসার কোম্পানির সহায়তায় বুধবার এই শিবিরটি শুরু হয়েছিল। সংস্থানের প্রধান বিজ্ঞানী ডঃ গৌরাঙ্গ বিশ্বাস আধুনিক পদ্ধতিতে প্রজাতি বৈচিত্র্যের মাধ্যমে স্থানীয় ও দেশীয় প্রজাতির মাছের মিশ্র চাষের প্রশিক্ষণ দেন। দুর্যোগ ও প্রাকৃতিক বিপর্যয়ের ক্ষতিকে এড়িয়ে মাছ চাষে লাভ নিশ্চিত করার বিষয়টিতে তিনি বেশি জোর দিয়েছেন। তাঁর কথায়, 'এধরনের প্রশিক্ষণে চাষিরা মাছ চাষে দীর্ঘমেয়াদি সুফল পাবেন এবং সকলের মিলিত প্রচেষ্টায় এই এলাকার পুকুরে স্থানীয় মাছের উৎপাদন নিশ্চিতভাবে বাড়বে।'

আধুনিক মৎস্যচাষ শিখে নিলেন চাষিরা

আজকালের প্রতিবেদন

কোচবিহার, ২৮ জুলাই

আধুনিক পদ্ধতিতে মিষ্টিজলে মৎস্যচাষ শিখলেন কোচবিহারের মৎস্যচাষিরা। জেলার পিছিয়েপড়া ক্ষুদ্র ও প্রান্তিক মৎস্যচাষিদের উন্নয়নের জন্য ৩ দিনের কর্মশালা করে কোচবিহার জেলা মৎস্য দপ্তর ও কেন্দ্রীয় মৎস্য শিক্ষা সংস্থা। কোচবিহারের জিরানপুরে কর্মশালাটি হয়। ২৬ থেকে ২৬ জুলাই পর্যন্ত চলবে কর্মশালাটি। উদ্বোধন করেন জেলার সহকারী মৎস্য অধিকর্তা প্রণব বিশ্বাস। ছিলেন কেন্দ্রীয় মৎস্য শিক্ষার সংস্থানের প্রধান বিজ্ঞানী ড. গৌরাঙ্গ বিশ্বাস।

কোচবিহার জেলা মৎস্য দপ্তর আয়োজিত কর্মশালায় অংশ নেন ২০ জন তফসিলি পুরুষ ও মহিলা মৎস্যচাষি। তাঁরা মাছের খাবার তৈরি, জল ও মাটি পরীক্ষা পদ্ধতি শেখেন। পাঠদানে অংশ নেন কোচবিহার-১ ব্লকের মৎস্য সম্প্রসারণ আধিকারিক শুভেন্দু সাহা ও অন্য আধিকারিকরা। ভারতীয় কৃষি অনুসন্ধান পরিষদের অধীনস্থ কেন্দ্রীয় মৎস্য শিক্ষা সংস্থানের উদ্যোগে ২০২৩ সালে হয়েছিল এমনই কর্মশালা। সেই সময়

BARTAMAN, 26/07/2024

জিরানপুরে মৎস্যচাষিদের প্রশিক্ষণ

সংবাদদাতা, দেওয়ানহাট: ক্ষুদ্র ও প্রান্তিক মৎস্যচাষিদের স্বনির্ভর করা ও তাঁদের আর্থসামাজিক উন্নয়নের লক্ষ্যে কোচবিহার-১ ব্লকের জিরানপুরে তিনদিনের প্রশিক্ষণ শিবির শুরু হয়েছে। যা আজ, শুক্রবার শেষ হবে। কলকাতার সল্টলেকে ভারতীয় কৃষি অনুসন্ধান পরিষদের কেন্দ্রীয় মৎস্য শিক্ষা সংস্থানের উদ্যোগে ও জিরানপুর ফার্মার্স প্রডিউসার কোম্পানির সহযোগিতায় বুধবার থেকে প্রশিক্ষণ শিবির শুরু হয়েছে। পাশাপাশি চাষিদের মাছ চাষের সামগ্রী বিতরণ করা হয়। কোচবিহার জেলা সহকারী মৎস্য অধিকর্তা প্রণব বিশ্বাস কর্মশালার উদ্বোধন করেন। কোচবিহার-১ ব্লকের মৎস্য সম্প্রসারণ আধিকারিক শুভেন্দু সাহা কর্মশালায় উপস্থিত থেকে চাষিদের উৎসাহিত করেন। কর্মশালায় ২০ জন চাষিকে মাছের খাবার তৈরি এবং জল-মাটি পরীক্ষা করা শেখানো হয়।

लोकसत्ता

विविधा

शिक्षण

बीबीए, बीसीए अभ्यासक्रम

केंद्रीय मात्स्यिकी शिक्षण संस्थेचा पदवी प्रदान समारंभ

दिनदर्शिका

मुलाखतीमध्ये गुण वाढविण्यासाठी संप

5 को आईसीएआर का दीक्षांत समारोह

मुंबई. अंधेरी पश्चिम वर्सोवा यारी रोड पर स्थित केंद्रीय मात्स्यिकी शिक्षा संस्थान, मुंबई (आईसीएआर) में 5 अप्रैल को शाम 4 बजे 17वां दीक्षांत समारोह का आयोजन किया गया है. केंद्रीय मात्स्यिकी शिक्षा संस्थान में होने वाले इस समारोह में मुख्य अतिथि वैज्ञानिक तथा औद्योगिक अनुसंधान के सचिव डॉ. एन. कलाइसेल्वी होगी. उक्त जानकारी वैज्ञानिक तथा प्रभारी मीडिया सेल के प्रधान डॉ. स्वदेश प्रकाश ने दी है.

संस्थान का 17 वां दीक्षांत

नवभारत

संस्थान

केंद्रीय मात्स्यिकी शिक्षा संस्थान देश में मत्स्य पालन की शिक्षा में उत्कृष्टता का केंद्र

मुंबई में है दुनिया का सबसे बड़ा केंद्रीय मात्स्यिकी शिक्षा संस्थान

कृषि विश्वविद्यालयों में देश के सबसे खूबसूरत परिसरों में से एक के रूप में मान्यता

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बिहार राज्यातील शेतकऱ्यांनी दिली कृषि विज्ञान केंद्रास भेट

कृषि विज्ञान केंद्रातील तज्ज्ञांचे मार्गदर्शन

डहाणू (प्रतिनिधी) : भारतीय कृषी अनुसंधान परिषदेच्या केंद्रीय मत्स्य विज्ञान शिक्षण संस्थेतर्फे बिहार राज्यातील शेतकऱ्यांनी कृषि विज्ञान केंद्रास भेट देऊन आधुनिक शेती आणि शेती पूरक व्यवसायांची माहिती घेतली. कृषि विज्ञान केंद्राचे प्रमुख शास्त्रज्ञ डॉ. विलास जाधव यांनी स्वागत केले. कृषि विज्ञान केंद्राच्या विविध उपक्रमांची माहिती दिली. कृषि विज्ञान केंद्रातर्फे राबविण्यात येणाऱ्या विविध प्रशिक्षण, ग्रामभेटीमुळे आणि विस्तार कार्यामुळे आदिवासी शेतकऱ्यांच्या पिकांचे उत्पादन तसेच शेतकऱ्यांचे उत्पन्न यामध्ये वाढ होत असल्याचे सांगितले. कृषि विज्ञान केंद्राचे शेती विकासातील योगदानामुळे आपसीएआरचा बेस्ट कृषि विज्ञान केंद्र तसेच महाराष्ट्र शासनातर्फे शेतीमित्र पुरस्कार मिळाल्याचे त्यांनी सांगितले. कृषि विज्ञान केंद्राचे शास्त्रज्ञ अशोक भोईर आणि प्रक्षेत्र व्यवस्थापक प्रशांत वरठा यांनी भात पीक प्रक्षेत्र, कुक्कुटपालन, शेळी पालन, बेकरी पूनिट फळ रोपवाटिका आदींबाबत सविस्तर मार्गदर्शन केले.

दरम्यान, कृषिभूषण पद्मेश साबे यांनी आधुनिक मत्स्य शेती करायी याबाबत माहिती दिली. तसेच कृषि उद्योजिका ललिका पाटील यांनी फळप्रक्रिया विषयी मार्गदर्शन करून शिकुये विविध प्रक्रियायुक्त पदार्थ कसे बनवतात यायी प्रात्यक्षिकायह माहिती दिली. डहाणूतील प्रगतिशील शेतकऱ्यांशी चर्चा केल्यामुळे आणि कृषि विज्ञान केंद्रास भेट दिल्यानेआधुनिक शेतीविषयी ज्ञानात भर पडली असून आपला आत्मविश्वास वाढला असल्याचे मत भेट दिलेल्या शेतकऱ्यांनी व्यक्त केले.

भारतीय कृषि अनुसंधान परिषदेच्या केंद्रीय मत्स्य विज्ञान शिक्षण संस्थेचे शास्त्रज्ञ डॉ.बालाजी अरगडे आणि अधिकारी संतोष यांनी प्रक्षेत्र भेटीचे समन्वयक म्हणून काम केले.

नवराष्ट्र

'कृषि'ला बिहारच्या शेतकऱ्यांची भेट

डहाणू, (वा.) भारतीय कृषी अनुसंधान परिषदेच्या केंद्रीय मत्स्य विज्ञान शिक्षण संस्थेतर्फे बिहार राज्यातील शेतकऱ्यांनी कृषि विज्ञान केंद्रास भेट देऊन आधुनिक शेती आणि शेती पूरक व्यवसायांची माहिती घेतली. कृषि विज्ञान केंद्राचे प्रमुख शास्त्रज्ञ डॉ. विलास जाधव यांनी स्वागत केले. कृषि विज्ञान केंद्राच्या विविध उपक्रमांची माहिती दिली. कृषि विज्ञान केंद्रातर्फे राबविण्यात येणाऱ्या विविध प्रशिक्षण, ग्रामभेटीमुळे आणि विस्तार कार्यामुळे आदिवासी शेतकऱ्यांच्या पिकांचे उत्पादन तसेच शेतकऱ्यांचे उत्पन्न यामध्ये वाढ होत आहे. कृषि विज्ञान केंद्राचे शेती विकासातील योगदानामुळे आपसीएआरचा बेस्ट कृषि विज्ञान केंद्र तसेच महाराष्ट्र शासनातर्फे शेतीमित्र पुरस्कार मिळाल्याचे त्यांनी सांगितले. कृषि विज्ञान केंद्राचे शास्त्रज्ञ अशोक भोईर आणि प्रक्षेत्र व्यवस्थापक प्रशांत वरठा यांनी भात पीक प्रक्षेत्र, कुक्कुटपालन, शेळी पालन, बेकरी पूनिट फळ रोपवाटिका आदींबाबत सविस्तर मार्गदर्शन केले.

चर्चेतून शेती विषयी ज्ञानात पडली भर

दरम्यान, कृषिभूषण पद्मेश साबे यांनी आधुनिक मत्स्य शेती करायी याबाबत माहिती दिली. तसेच कृषि उद्योजिका ललिका पाटील यांनी फळप्रक्रिया विषयी मार्गदर्शन करून शिकुये विविध प्रक्रियायुक्त पदार्थ कसे बनवतात यायी प्रात्यक्षिकायह माहिती दिली. डहाणूतील प्रगतिशील शेतकऱ्यांशी चर्चा केल्यामुळे आणि कृषि विज्ञान केंद्रास भेट दिल्यानेआधुनिक शेतीविषयी ज्ञानात भर पडली असून आपला आत्मविश्वास वाढला असल्याचे मत भेट दिलेल्या शेतकऱ्यांनी व्यक्त केले. भारतीय कृषि अनुसंधान परिषदेच्या केंद्रीय मत्स्य विज्ञान शिक्षण संस्थेचे शास्त्रज्ञ डॉ.बालाजी अरगडे आणि अधिकारी संतोष यांनी प्रक्षेत्र भेटीचे समन्वयक म्हणून काम केले.

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Ministry of Fisheries, Animal Husbandry & Dairying

Azadi Ka Amrit Mahotsav

ICAR-CIFE and VAMNICOM Sign MoU to Enhance Cooperative Management in Fisheries

Posted On: 27 AUG 2024 4:53PM by PIB Mumbai

Mumbai, 26 August 2024

In a significant stride towards fostering collaboration in the field of cooperative management within the fisheries sector, the Central Institute of Fisheries Education (ICAR-CIFE) and the Vaikunth Mehta National Institute of Cooperative Management (VAMNICOM) signed a Memorandum of Understanding (MoU) on Monday (August 26, 2024). **This is an important step forward in realization of the vision of establishment of 2 lakh PACS, Dairy and Fishery Cooperatives in every Panchayat.**

Fisheries in India provides livelihood to 14.46 million people and this strategic partnership aims to enhance integration and reach of advanced technology as well as promotion of value addition in fishery cooperatives. VAMNICOM and ICAR-CIFE will together explore new opportunities in the area of Fish, Fish cooperative and Fisheries ecosystem from the perspective of education, research, capacity building and consultancy.

The ceremony, held at the ICAR-CIFE campus in Mumbai, was graced by Dr. Ravishankar CN, Director and Vice Chancellor of ICAR-CIFE, and Dr. Hema Yadav, Director of VAMNICOM. Scientists, faculty members, and key team members from both institutions were also present on the occasion.

बिहारच्या शेतकऱ्यांची कोसबाडच्या कृषी विज्ञान केंद्रास भेट	19 August 2024	लोकमत न्यज़ू नेटवक्र्	मराठ‚
ICAR-CIFE and VAMNICOM Sign MoU to Enhance Cooperative Management in Fisheries	20 August 2024	Press Information Bureau, Mumbai	English
Minister of Fisheries, Mizoram inaugurated the capacity building programme for fish farmers on modern methods of freshwater aquaculture	05 September 2024	ICAR-News	English
केंद्रीय मात्स्यिकी शिक्षा संस्थान देश में मत्स्य पालन की शिक्षा में उत्कृष्टता का केंद्र मुंबई में है दुनिया का सबसे बड़ा केंद्रीय मात्स्यिकी शिक्षा संस्थान	11 September 2024	Navbharat	Hindi
कम जगह में अधिक मछली उत्पादन की नई तकनीक है बायोफ्लॉक	27 October 2024	Jagran	Hindi
CM puts stress on innovative, transformative practices in aquaculture	04 November 2024	Assam Tribune, Guwahati Assam	Assamese
National training on biofloc at Kalong Kapili, Sonapur	04 November 2024	Dainik Assam	Assamese
Scientific methods of biofloc fish farming at Bagibari	04 November 2024	Niyamia Barta	Assamese
Workshop on modern freshwater aquaculture techniques launched	13 November 2024	The Meghalayan Express	English
ICAR-CIFE launches skill development initiative for fish farmers in Tezu	14 November 2024	Arunachal 24	English
Samikruta vyavasayamlo ardika vrudhi	14 November 2024	Eenadu	Telugu
Antibiotics leni aquaculture cheyali	23 November 2024	Velugu	Telugu
Antibiotics rahita sagu cheypattali	23 November 2024	Sakshi	Telugu
Dakhata Vikash Prashikshan Karyasuchi	28 November 2024	Ashamia Pratidin	Ashamia
Manchinetilo samikruta chepala pempakam laabadhayakam	14 December 2024	Andhra jyothi	Telugu
Raithla jevanopadhi merugupadali	14 December 2024	Eenadu	Telugu

लोकमत

तज्ज्ञांकडून मार्गदर्शन

बिहारच्या शेतकऱ्यांची कोसबाडच्या कृषी विज्ञान केंद्रास भेट

लोकमत न्यूज नेटवर्क

बोर्डी : भारतीय कृषी अनुसंधान परिषदेच्या केंद्रीय मत्स्य विज्ञान शिक्षण संस्थेतर्फे बिहारमधील शेतकऱ्यांनी कृषी विज्ञान केंद्रास भेट देऊन आधुनिक शेती आणि शेतीपूरक व्यवसायाची माहिती घेतली. कृषी विज्ञान केंद्राचे प्रमुख शास्त्रज्ञ डॉ. विलास जाधव यांनी सर्वांचे स्वागत करून कृषी विज्ञान केंद्राच्या विविध उपक्रमांची माहिती दिली. या केंद्रातर्फे राबविल्या जाणाऱ्या विविध प्रशिक्षण, प्रात्यक्षिके व विस्तार कार्यामुळे येथील आदिवासी शेतकऱ्यांच्या पिकांचे उत्पादन व शेतकऱ्यांचे उत्पन्न यामध्ये वाढ होत आहे. कृषी विज्ञान केंद्राचे शेती विकासातील योगदानामुळे आयसीएआरचा बेस्ट कृषी विज्ञान केंद्र व महाराष्ट्र शासनातर्फे शेतीमित्र पुरस्कार मिळाल्याचे त्यांनी सांगितले.

बिहार राज्यातील शेतकऱ्यांनी डहाणू तालुक्यातील कृषी विज्ञान केंद्रास भेट देऊन आधुनिक शेती आणि शेतीपूरक व्यवसायाची माहिती घेतली.

प्रगतिशील शेतकऱ्यांशी चर्चा

- कृषी विज्ञान केंद्राचे शास्त्रज्ञ अनोक भोईर आणि प्रक्षेत्र व्यवस्थापक प्रशांत उरसा यांनी भात पीक प्रदेश, कुक्कुटपालन, शेळी पालन, रेकमी दुग्धित फळप्रक्रियाविषयी, आदीवासात सविस्तर मार्गदर्शन केले. यावेळी कृषिभूषण राहीरा साबे यांनी आधुनिक मत्स्य शेती कशी करावी याबाबत माहिती दिली.
- प्रगतिशील महिला शेतकरी लतिका पाटील यांनी फळप्रक्रियाविषयी मार्गदर्शन करून चिकूचे विविध प्रक्रियायुक्त पदार्थ कसे बनवितात याची प्राथमिकासह माहिती दिली. डहाणूतील प्रगतिशील शेतकऱ्यांशी चर्चा फेलाने व कृषी विज्ञान केंद्रास भेट दिल्याने आधुनिक शेतीविषयी ज्ञानात भर पडली आहे.
- आपला आत्मविश्वास वाढला असल्याचे मत भेट दिलेल्या शेतकऱ्यांनी व्यक्त केले. भारतीय कृषी अनुसंधान परिषदेच्या केंद्रीय मत्स्य विज्ञान शिक्षण संस्थेचे शास्त्रज्ञ सिवाजी अगडे व अधिकारी संतोष हेही हजर होते.

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नवभारत

केंद्रीय मात्स्यिकी शिक्षा संस्थान में दीक्षांत समारोह का आयोजन

भारत मछली उत्पादक का दूसरा सबसे बड़ा देश

■ अंधेरी, नवभारत न्यूज नेटवर्क.

केंद्रीय मात्स्यिकी शिक्षा संस्थान की ओर से छात्रों को डिग्री प्रदान करने के लिए 17 वां दीक्षांत समारोह का आयोजन यारी रोड स्थित केंद्रीय मात्स्यिकी शिक्षा संस्थान के प्रांगण में किया गया. समारोह को संबोधित करते हुए मुख्य अतिथि डॉ.एन. कलैसेल्वी महानिदेशक वैज्ञानिक एवं औद्योगिक अनुसंधान परिषद एवं सचिव विज्ञान एवं औद्योगिक अनुसंधान विभाग ने भारत में 28 मिलियन लोगों को रोजगार देने वाले एक संपन्न और तेजी से उभरते क्षेत्र के मजबूती प्रदान करने में व्यवसायिक मात्स्यिकी शिक्षा की भूमिका की सराहना की. उन्होंने कहा कि 2022 में 16.24 मिलियन टन मछली के कुल उत्पादन में जलीय कृषि का बढ़ता योगदान इस क्षेत्र में बढ़ती उद्यमशीलता गतिविधि को दर्शाता है. इससे पता चलता है कि प्रभावी प्रौद्योगिकियों को विकसित और लागू किया जा रहा है. भारत दुनिया में मछली का दूसरा सबसे बड़ा उत्पादक बना हुआ है. यह क्षेत्र भारत की जीडीपी में लगभग 1.2% का योगदान देता है और निर्यात आय 2023 के दौरान रु. 64,000 करोड़ तक पहुंच गई है.

31.89 लाख मछुआरों व किसानों को बीमा कवरेज

पिछले पांच वर्षों में भारत सरकार की प्रधानमंत्री मत्स्य सम्पदा योजना ने 22 राज्यों और 7 केंद्र शासित प्रदेशों के 31.89 लाख मछुआरों और किसानों को बीमा कवरेज दिया है और अतिरिक्त 6.77 लाख मछुआरों को लीन/बैन अवधि के दौरान आजीविका और पोषण संबंधी सहायता के लिए कवर किया है. यह योजना नवाचारों और आधुनिक प्रौद्योगिकी को अपनाने, मछली की सुरक्षा और गुणवत्ता में सुधार, कोल्ड चेन, फसल के बाद के बुनियादी ढांचे के विकास, आधुनिक मूल्य श्रृंखला और ट्रेसेबिलिटी, मत्स्य पालन प्रबंधन के वैज्ञानिक ढांचे और मछुआरों के कल्याण के माध्यम से फलीभूत हुई है. भारत को दुनिया में गुणवत्तापूर्ण मछली का अग्रणी उत्पादक और उपभोक्ता बनाने की इस परिवर्तनकारी यात्रा में मात्स्यिकी शिक्षा और व्यवसाय की भूमिका महत्वपूर्ण है. डॉ. कलैसेल्वी ने अंतर्देशीय लवणीय जलीय कृषि के लिए ऊर्जा - कुशल और पर्यावरण के अनुकूल प्रौद्योगिकियों को विकसित करने में आईसीएआर-सीआईएफई के महत्वपूर्ण योगदान की भी सराहना की. इस अवसर पर डॉ. आर. सी. अग्रवाल, उप महानिदेशक (रिसर्च), डॉ. जॉय कुमार जेना, उप महानिदेशक मात्स्यिकी विज्ञान बनीर अतिथि उपस्थित रहे. दीक्षांत समारोह में 90 मास्टर और 32 पीएचडी. छात्रों को डिग्री प्रदान की गई. कार्यक्रम व्यवस्थापन के लिए वक्ताओं ने केंद्रीय मात्स्यिकी शिक्षा संस्थान के प्रधान वैज्ञानिक व अधिष्ठाता डॉ. स्वदेश प्रकाश तिवारी की प्रशंसा की.

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Exhibitions

4.8. Exhibition Organized

Event	Venue	Dates	No. of Visitors
Vesava Koli Seafood Festival	Versova, Mumbai	19-21 January 2024	1000
Krishi Mela	Sasya Shyamala Krishi Vigyan Kendra, South 24 Paragana, West Bengal	7-9 February 2024	450
Mahila Koli Seafood Festival	Versova, Mumbai	16-18 February 2024	600
Matsya Pranee Samaveh Odisha (MSPO) 2024	Janta Maidan, Bhubaneswar, Odisha	16-18 February 2024	1000
Kids Museum Fest	Aquatic Biodiversity Museum of ICAR CIFE	18 May 2024	100
Ornamental Live Fish Exhibition organized on occasion of study visit of Parliamentary Committee of Government of India to ICAR-CIFE Mumbai.	ICAR-CIFE Mumbai	26 June 2024	100
96th ICAR Foundation and Technology Day	NASC Complex, New Delhi	15-16 July 2024	300
27th National Agriculture Exhibition 2024	Science City, Kolkata, West Bengal	11-14 September 2024	800
23rd Edition Agro + Organic India World Expo and 14th Edition of Ayush Natural World Expo	Bombay Exhibition Centre, NESCO, Goregaon (E), Mumbai	27-29 November 2024	280
30th Indian Convention of Food Scientists and Technologists (ICFoST), Mysuru	Medical College, DY Patil University, Navi Mumbai	19-21 December 2024	260
Kristi Mela O Loko Sanskriti Utsab, 2024	Kultali, Narayantala, Basanti, South 24 Parganas, West Bengal	20-29 December 2024	2000
Acharya Prafulla Chandra Roy Smarak Vigyan Mela O Pradarshani	West Bengal University of Animal & Fishery Sciences, Belgachia, Kolkata, West Bengal	26-29 December 2024	600
		Total	**7490**

4.9. Visits Coordinated

Date	Coordinator(s)	Visiting Organization / University / College	No. of Visitors Total (Male, Female)
ICAR-CIFE, Mumbai			
17 January 2024	**Overall** All HoDs **FEES Division** Dr. Ankush L. Kamble Mr. Simant Kumar **Aquaculture Division** Dr. Madhuri Pathak Shri. Satya Prakash **FRMPHM Division** Mr. Abuthagir Iburahim S. Mr. Dayal Devadas Dr. Pawan Kumar Mr. Avinash Sable **AEHM Division** Dr. Nalini Poojari Shri. Amit Kumar **FNBP Division** Mrs. G. Aruna Devi Shri. Pritam Kumar **FGB Division** Dr. Kiran Rasal Mrs. Reshma Raje	CoF, BSKKV, Ratnagiri Maharashtra	58 (M: 44, F: 14)
22 January 2024		CoF, Veraval, Gujrat	71 (M: 53, F: 18)
30 January 2024		COF, Udgir, Maharashtra	27 (M: 13, F: 14)
08 February 2024		CEMAS University, Mumbai	12 (M: 4, F: 8)
12 February 2024		CoF, Navsari, Gujarat	24 (M: 19, F: 5)
20 February 2024		CoA, Dhubri, Assam	43 (M: 26, F: 17)
21 February 2024		CoA, Charali, Assam	44 (M: 32, F: 12)
22 February 2024		CoH, Nalbari Assam	25 (M: 12, F: 13)
2 March 2024		Art, Commerce and Science College, Palghar	52 (M: 33, F: 19)
08 March 2024		CoF, Ponneri , Tamil Nadu	44 (M: 17, F: 27)
10 March 2024		CoA, Vallanadu, Thoothukudi	116 (M: 50, F: 66)
28 March 2024		Ismail Yusuf College Jogeshwari, Mumbai	26 (M: 08, F: 18)
12 April 2024		CoA, Palani, Namakkal	119 (M: 52, F: 67)
15 April 2024		CoF, Lembucherra, Tripura	40 (M: 21, F: 19)
18 April 2024		CoA, Radhapuram, Tamil Nadu	96 (M: 35, F: 61)
22 April 2024		CoF, Ponneri, Tamil Nadu	45 (M: 28, F: 17)
24 April 2024		CoF, Nagapattinam, Tamil Nadu	30 (M: 16, F: 14)
10 May 2024		CoF, Thoothukudi, Tamil Nadu	48 (M: 18, F: 30)
14 June 2024		International School Andheri, Mumbai	94 (M: 44, F: 50)
18 July 2024		CoF, Kolkata, West Bengal	37 (M: 29, F: 08)
2 August 2024		Somiya College of Science and Commerce Vidyavihar (E), Mumbai	18 (M: 05, F: 13)
27 August 2024		CoF, Mangalore, Karnataka	47 (M: 30, F: 17)
28 August 2024		Ismail Yusuf College, Jogeshwari (E), Mumbai	28 (M: 08, F: 20)
23 September 2024		CoF, Dholi, Bihar	38 (M: 24, F: 14)
26 September 2024		OES International School, Andheri (W), Mumbai	46 (M: 20, F: 26)
16 October 2024		Children Welfare Centre High School, Andheri (W), Mumbai	36 (M: 17, F: 19)
24 October 2024		CoF, Tamil Nadu	16 (M: 02, F: 14)
13 November 2024		Kalasalingam Academy of Research and Education, Tamil Nadu	37 (M: 10, F: 27)

ICAR-CIFE, Kakinada Centre			
2 May 2024	ICAR-CIFE, Kakinada Staff	Ideal College of Arts & Science	25 (M: 20, F: 5)
12 September 2024	ICAR-CIFE, Kakinada Staff	SIFT, Kakinada	41 (M: 30, F: 11)
08 November 2024	ICAR-CIFE, Kakinada Staff	Government Degree College, Rampachodavaram	47 (M:29, F: 18)
19 December 2024	ICAR-CIFE, Kakinada Staff	Little Woods School, Kakinada	123 (M: 70, F: 53)
19 December 2024	ICAR-CIFE, Kakinada Staff	Meghalaya	10 (M: 10, F: 0)
		Total	**246 (M: 159, F: 87)**
ICAR-CIFE, Motipur Centre			
06 December 2024	ICAR-CIFE, Motipur Staff	CoF, Doli	30 (M: 20, F: 10)
20 December, 2024	ICAR-CIFE, Motipur Staff	CoF, Doli	30 (M: 21, F: 09)
		Total	**60 (M: 41, F: 19)**
ICAR-CIFE, Powerkheda Centre			
05 January 2024	Dr. Sunil K. Nayak Mr. Dhalongsaih Reang Dr. Harsha Haridas	Government College, Babai, Narmadapuram, MP	33 (M: 24, F: 09)
28 March 2024	Dr. Sunil K. Nayak Mr. Dhalongsaih Reang Dr. Harsha Haridas	Kendriya Vidhalaya, Itarsi, MP	60 (M: 40, F: 20)
10 May 2024	Dr. Sunil K. Nayak Mr. Dhalongsaih Reang Dr. Harsha Haridas	ACABC, Bhopal, MP	27 (M: 27, F: 0)
15 May 2024	Dr. Sunil K. Nayak Mr. Dhalongsaih Reang Dr. Harsha Haridas	NMV College, Itarsi, MP	15 (M: 10, F: 5)
18 July 2024	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas	Rise Government Higher Secondary School, Powarkheda, Narmadapuram, MP	19 (M: 11, F: 08)
04 September 2024	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas	Rise Government Higher Secondary School, Powarkheda, Narmadapuram, MP	36 (M: 21, F: 15)
13 September 2024	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas	Rise Government Higher Secondary School, Powarkheda, Narmadapuram, MP	39 (M: 22, F: 17)
07 October 2024	Dr. Shashi Bhushan Mr. Dhalongsaih Reang Dr. Harsha Haridas	St. Paul'S Balagram School, Raisalpur, Narmadapuram, MP	80 (M: 32, F: 48)

ICAR-CIFE, Kolkata Centre			
2 February 2024	ICAR-CIFE, Kolkata Staff	JOHAR Project Officials, Jharkhand	27 (M: 22, F: 5)
1 March 2024	ICAR-CIFE, Kolkata Staff	CoF, Tripura	39 (M: 20, F: 19)
6 March 2024	ICAR-CIFE, Kolkata Staff	Farmers, Narendrapur, West Bengal	29 (M: 29, F: 0)
19 May 2024	ICAR-CIFE, Kolkata Staff	Fish Farmers, Madhepura, Bihar	30 (M: 30, F: 0)
20 May 2024	ICAR-CIFE, Kolkata Staff	CoF, Kishanganj, Bihar	30 (M: 11, F: 19)
14 June 2024	ICAR-CIFE, Kolkata Staff	Dinabandhu Andrews College, Garia, Kolkata	29 (M: 11, F: 18)
7 July 2024	ICAR-CIFE, Kolkata Staff	Fish Farmers, Muzaffarpur, Bihar	28 (M: 28, F: 0)
14 July 2024	ICAR-CIFE, Kolkata Staff	Fish Farmers, Bhagalpur, Bihar	22 (M: 22, F: 0)
20 August 2024	ICAR-CIFE, Kolkata Staff	Ashutosh College, Kolkata, West Bengal	61 (M: 26, F: 35)
10 September 2024	ICAR-CIFE, Kolkata Staff	Fish Farmers, Sonarpur, Kolkata, West Bengal	13 (M: 13, F: 0)
		Total	**308 (M: 212, F: 96)**
		Grand Total	**3146 (M: 1772, F: 1374)**

4.10. Agri-Business Incubation (ABI) Centre, ICAR-CIFE

Project Team: Dr. S. P. Shukla (PI), Dr. Shivaji Argade & Dr. Layna P. (Co-PIs) and Dr. Paramita Banerjee Sawant, Dr. Md. Aklakur, Dr. Manish Jayant & Dr. D. Bhoomaiah (Members)

Brief Achievements: The ICAR-CIFE Agri Business Incubation (ABI) Centre is funded by the National Agricultural Innovation Fund (NAIF) and Component II (Incubation Fund). It aims at promoting innovations in the fisheries sector. The Agri-Business Incubation (ABI) Centre at ICAR-CIFE was inaugurated on March 03, 2017, at the Institute's Seven Bungalow campus in Andheri (W), Mumbai. The center aims to support and guide incubatees by providing facilities and services. It offers incubation facilities in various areas, including Biofloc, Aquaponics, fish feed, fish value-added products, fish byproducts, waste to wealth, organic manure from fish waste, ornamental fish culture, spirulina culture, pearl culture, shrimp culture, fish culture, and inland saline water shrimp aquaculture. The ABI allows prospective entrepreneurs to run small-scale production using the available facilities at CIFE. Incubatees pay nominal charges and bear all costs, including overheads. Scientists and technical experts from the institute provide support and monitor the progress of the incubatees.

To date, the ABI has registered 149 incubatees, which include individual incubatees, student incubatees, women incubatees from SHGs, and startup incubatees from 32 Startup/business ventures registered at ABI, ICAR-CIFE. ABI has conducted 56 training and awareness programs for entrepreneurship and skill development and benefitted to 2252 people. The Institute has provided space for incubatee cloud kitchen setup, and counter shop space is also allocated for the sale of incubatees' products. Furthermore, the ABI has supported technological development and innovation. ICAR-CIFE encourages entrepreneurship by hosting and facilitating business incubates in its Agri-Business Incubator.

Total Incubatees till December 2024: 149

4.10.1 Awareness / Training Programs Conducted by ABI during 2024

Events	No. of Participants
Aquapreneurship development program “COHORT-One” on 30-31 May 2024	166
Two training programmes from 13- 22 August 2024 and 28 August to 04 September 2024 on Fish Processing and Value-added fish products	42
AGRI UDAAN® 7.0 Roadshow/Start-up Hunt event on 24 September 2024	85
Start-up India registration and benefits to entrepreneurs on 13 November 2024	13
Company registration and the benefits available to budding entrepreneurs/startups on 16 December 2024	13
Entrepreneurship Development through Aquaculture	99
Samudraswad 2025	210
Total	**628**

a-IDEA, Technology Business Incubator (TBI) of ICAR-NAARM, Hyderabad, in collaboration with ABI, ICAR-CIFE, Mumbai organized an AGRI UDAAN® 7.0 Roadshow/Start-up hunt event at ICAR-CIFE 24-09-2024

Agri-Business Incubation Center & FRHPHM Division, ICAR-CIFE, Mumbai organized a training programme on “Fish Processing and Value-added fish products” in collaboration with Jawaharlal Nehru Port Authority, Navi Mumbai & Snehdeep Bahhuddeshiya Gramin Vikas Sanstha, Yavatmal from 28-08-2024 to 04-09-2024

4.10.2 Recognitions received by ABI

Appreciation Certificate received from Padma Bhushan Shri Ram Naik (Former Governor of Uttar Pradesh), President of Fisheries Development Policy Committee, Maharashtra, for the successful organization of ABI COHORT-One program (Ref.: Letter received from Shri Ram Naik (Former Governor of Uttar Pradesh; Dated: June 21, 2024).

The ICAR-CIFE Incubation facility has been recognized as one of the three designated fisheries incubation centers for promoting fisheries startups (Ref.: Letter received from Dr. Nilesh Pawar, Deputy Director (AQ), Government of India, Ministry of Fisheries, Animal Husbandry & Dairying, Department of Fisheries; Dated: July 30, 2024).

4.10.3 Active Start-Ups by ABI Incubatees

Start-Up	Area	Mentor
Aquadore Ventures Private Limited, Alibag	New category of ready eat fish snacks items	Dr. Layana P.
Sensoact Innovations Pvt. Ltd.	Spirulina extract based byproduct	Dr. S. P. Shukla
Aryston Pearlscape Pvt. Ltd.	Pearl farming	Dr. S. P. Shukla
Mukesh Fish Shop & Fish Industry	Fish processing	Dr. B. B. Nayak
Shree Aquaculture	Ornamental fish culture & Seaweed cultivation	Dr. Paromita Banergee Sawant Dr. Madhuri Pathak
Taji Machi Restaurant	Value added fish products development	Dr. B. B. Nayak
Lapacilo Enternmentainments Pvt. Ltd.	Fish processing	Dr. B. B. Nayak
Raftech Solutions Pvt. Ltd.	Seaweed cultivation & processing	Dr. Madhuri Pathak
Matsya Ruchi	Value added fish products development	Dr. B. B. Nayak
Westcoast Aquatics	Fish value added products and fish by-products	Dr. B. B. Nayak
Longshore Technologies Private Limited	Shrimp waste valorisation	Dr. Layana P.
Palaye Seafood - Bangada Bytes	Value added dry fish products	Dr. B. B. Nayak
Fish For Fish	Value added fish products	Dr. B. B. Nayak
Keetup India Pvt. Ltd.	Improvement of quality of aquaculture feed with BSF	Dr. Shamna N.
United Fisheries, Nashik	Aquaculture	Dr. Debajit Sarma Dr. Kapil Sukhdhane r. Madhuri Pathak

4.10.3 Active Start-Ups by ABI Incubatees

Sl. No.	Incubatee	Area	Incubatee Category	Mentor(s)
1.	Mr. Amitkumar Patil	Creating a new category of ready to eat fish snacks items	Startup	Dr. Layana P.
2.	Mr. Amol Bhagat	Creating a new category of ready to eat fish snacks items	Startup	Dr. Layana P.
3.	Mr. Rohan Patil	Creating a new category of ready to eat fish snacks items	Startup	Dr. Layana P.
4.	Mr. Divyansh Shah	Spirulina culture	Individual	Dr. S. P. Shukla
5.	Dr. Manjusha Joshi	Spirulina culture and extract based product development	Startup	Dr. S. P. Shukla
6.	Dr. Geeta Malbhange	Spirulina culture and extract based product development	Startup	Dr. S. P. Shukla
7.	Mr. Navendu Das	Fish Preservation Technique	Individual	Dr. Mandakini Devi H.
8.	Mr. Amit Sarkar	Fish Processing and Value addition	Individual	Dr. Mandakini Devi H.
9.	Mr. Pritam Todankar	Aquaponics	Individual	Dr. A. K. Verma
10.	Mr. Rohit Bhalwankar	Spirulina and pearl culture	Startup	Dr. S. P. Shukla
11.	Mrs. Deepa Pohuja Nee Bhalwankar	Spirulina and pearl culture	Startup	Dr. S. P. Shukla
12.	Mr. Mukesh Sable	Fish processing	Startup	Dr. B. B. Nayak
13.	Mr. Rakesh Sawant	Ornamental fish culture & Seaweed cultivation	Startup	Dr. Paromita Banergee Sawant Dr. Madhuri Pathak
14.	Mr. Akshay Jadhav	Seaweed cultivation & processing	Startup	Dr. Madhuri Pathak
15.	Ms. Trisha Sambhodhi	Seaweed cultivation & processing	Startup	Dr. Madhuri Pathak
16.	Ms. Prachi Sable	Seaweed cultivation & processing	Startup	Dr. Madhuri Pathak
17.	Mrs. Apurva Salvi	Value added fish products	Startup	Dr. B. B. Nayak
18.	Mrs. Krishna Dhimmar	Value added fish products	Startup	Dr. Layana P.
19.	Ms. Anusha Patel	Product development from Phycocyanin	Student	Dr. S. P. Shukla
20.	Mr. Sachin Mishara	Fish Value Added Product development	Individual	Dr. Mandakini Devi H.
21.	Mr. Ravi Shekhar	Aquaponics	Individual	Dr. A. K. Verma
22.	Mr. Nitin Nikam	Fish value added products and fish by-products	Startup	Dr. B. B. Nayak
23.	Mr. Heman Seth	Fish value added products and fish by-products	Startup	Dr. B. B. Nayak

24.	Daryavardi Producer Company Ltd.	Fish value added products	FFPO	Dr. S. P. Shukla Dr. Layana P. Dr. Shivaji Argade
25.	Mrs. Suchitra Palaye	Value added dry fish products	Startup	Dr. B. B. Nayak
26.	Mr. Bhushan Koli	Value added fish products	Startup	Dr. B. B. Nayak
27.	Mrs. Nisha Koli	Value added fish products	Startup	Dr. B. B. Nayak
28.	Mrs. Mausumi Jena	Fish Processing	Startup	Dr. B. B. Nayak
29.	Mr. Shubram Kumar Jena	Fish Processing	Startup	Dr. B. B. Nayak
30.	Mr Amey Naik	Shrimp waste valorisation	Startup	Dr. Layana P.
31.	Mr. Shine Jose	Development of innovative Seaweed cultivation device	Student	Dr. S. P. Shukla
32.	Mrs. Suman Sawant	Fresh fish packaging and marketing	Individual	Dr. B. B. Nayak
33.	Mr. Atharva Harmalkar	Ornamental fish breeding and culture	Individual	Dr. Paramita Banerjee Sawant Dr. Debajit Sharma Dr. Shivaji Argade
34.	Dr Sheeba Samson Hero	Spirulina culture and product development	IndividualDr. S. P. Shukla	
35.	Mr. Shagun Sharma	Improvement of quality of aquaculture feed with BSFL	Startup	Dr. Shamna N.
36.	Ms. Punita Sharma	Improvement of quality of aquaculture feed with BSFL	Startup	Dr. Shamna N.
37.	Mr. Sanjay Gahlod	Aquaculture	Startup	Dr. Debajit Sarma Dr. Kapil Sukhdhane Dr. Madhuri Pathak
38.	Mrs. Suchitra Gahlod	Aquaculture	Startup	Dr. Debajit Sarma Dr. Kapil Sukhdhane Dr. Madhuri Pathak
39.	Ms. Priya Pardeshi	Aquaculture	Startup	Dr. Debajit Sarma Dr. Kapil Sukhdhane Dr. Madhuri Pathak
40.	Mr. Santhosh Kumar M.	e-Platform for rural-based aqua-tourism	Student	Dr. Ananthan P. S. Dr. Shivaji Argade
41.	Mr. Pradip Lanjile	Empower Peel	Student	Dr. Shivaji Argade
42.	Mr. Ajinkya	Evaluation of Bioactive properties of phycocyanin and biopharmaceutical product development	Student	Dr. S. P. Shukla

Chapter 5
HRD

5.1. Faculty & Staff

CIFE Head Quarters, Mumbai

RMP

Director
Dr. Ravishankar C.N.

Joint Director
Dr. N.P. Sahu

Scientific Staff

Heads of Division
Dr. Debajit Sarma
Dr. Kedar Nath Mohanta
Dr. Arpita Sharma
Dr. Mukunda Goswami
Dr. Megha Kadam Bedekar
Dr. B.B. Nayak

Principal Scientists

Dr. Naresh S. Nagpure
Dr.K.V.Rajendran (upto 31.05.2024)
Dr. (Mrs.) Aparna Chaudhari
Dr. S. Jahageerdar
Dr. K. Pani Prasad (upto 08.03.2024)
Dr. P.P. Srivastava (On deputation)
Dr. Ashok Kumar Jaiswar (upto 31.12.2024)
Dr. Rupam Sharma
Dr.(Mrs.)Gayatri Tripathi
Dr. Satya Prakash Shukla
Dr. Swadesh Prakash
Dr. Subodh Gupta
Dr. Sukham Munil Kumar
Dr. Ashutosh D. Deo
Dr. P.S. Ananthan
Dr. Sanath Kumar H.
Dr. Manoj Pandit Brahmane
Dr. (Mrs) Paramita Banerjee Sawant
Dr. Ajit Kumar Verma
Dr.(Mrs.) Asha T. Landge
Dr. (Mrs.)Babitha Rani A.M.
Dr. Sonwane Arvind Asaram

Senior Scientists
Dr. (Mrs.)Vidya Shree Bharti
Dr. A. Pavan Kumar
Dr. Prem Kumar
Dr. Kundan Kumar
Dr. Vinod Kumar Yadav
Dr. Ankush Lala Kamble
Dr. (Mrs.) Manjusha L.
Dr. Sangeeta Mandal
Dr. (Mrs.) Sukham Monalisha Devi
Dr. Sunil Kumar Nayak (wef 26.6.2024)
Dr. Arun Sharma
Dr.(Mrs.) Thongam Ibemcha Chanu
Dr. Sikendra Kumar
Dr. Shashi Bhushan (upto 19.06.2024)
Dr. Mujahidkhan A. Pathan (upto 6.8.2023)
Dr. Saurav Kumar (wef 27.02.2023)
Dr.(Mrs.) Tincy Verghese
Dr. Shivaji Dadabhau Argade

Scientists
Dr.(Mrs) Jeena K.
Dr. Dhamotharan K. (Dismissed on 18.06.2024)
Dr. Karankumar K. Ramteke
Dr. Kiran Dashrath Rasal
Dr.(Mrs.) Neha Wajahat Qureshi
Dr.(Mrs.) Layana P.
Dr. Saloni Shivam
Dr. Manish Jayant
Dr. Sukhdhane Kapil Sukhdeo
Dr. (Mrs.) Upasana Sahoo
Dr.(Mrs.) Madhuri Pathak
Mr. Angom Lenin Singh
Ms Deepitha R.P
Mr. Dayal Devadas
Ms. Shobha Rawat
Mr. Abuthagir Iburahim S.
Ms. R. Bharathi Rathinam

Technical Staff

Chief Technical Officers (T-9)
Dr. Dasari Bhoomaiah
Mr. P.K. Das
Dr. (Mrs) Nalini Poojary
Mr. Subhash Chand
Mrs. Rekha Nair (wef 28.06.2024)

Asst. Chief Technical Officers (T-7/8)
Dr. Chandrakant M.H. (upto 19.02.2024)
Mrs. Rajani H. Khandgale
Mr. S. Maity (wef 22.03.2024)

Technical Officers (T-5)
Mr. B.J. Rathod
Mr. N.K. Aglave
Mrs. G. Aruna Devi
Mr. Avinash Sable
Mr. Sagar Suresh Sawant

Mr. Rajarshee Moitra
Dr. Pawan Kumar
Mr. Mohd. Baqar
Mrs. Reshma K. Raje
Mr. Dhanpat Singh Rawat (upto 31.07.2024)

Technical Assistant (T-3)
Sh. Pranaya Kumar Biswal
Mr. Abhijeet Vijay Jadhav (wef 19.08.2023)

Sr. Technicians (T-2)
Mr. Mohd Sadiq M. Mulla (upto 31.10.2024)
Mr. T.G. Gaikwad
Mr. G.B. Kamble

Technicians (T-1)
Mr. Arvind M. Lavande (wef 03.01.2024)
Smt. R. H. Chavan (wef. 03.01.2024)
Mr. Ankush N. Joyashi (wef 03.01.2024)
Smt. Reshma Naik (wef 03.01.2024)
Mr. Amit Kumar (wef 01.05.2024)
Mr. Nitish Singh (wef 03.05.2024)
Mr. Akshay Parag Aate (wef 03.05.2024 AN)
Mr. Satya Prakash (wef 06.05.2024)
Mr. Vikash Kumar (wef 06.05.2024 – 10.09.2024)
Mr. Pritam Kumar (wef 06.05.2024)
Mr. Simant Kumar (wef 06.05.2024)

Administrative Staff

Chief Administrative Officer (SG)
Mr. Kishan Lal Meena

Comptroller
Mr. Rajneesh Kumar Singh

Joint Director (OL)
Shri Jagadeesan A. K. (wef 01.01.2024)

Sr. Administrative Officer
Mr. Navin Kumar (upto 17.04.2024)

Law Officer (Zone 3)
Mr. Jitender Khanna

Administrative Officer
Mrs. Poonam N. Behl
Mr. Yogesh R. Pathare (upto 31.12.2024)
Mr. Sahil Yadav (wef 23.04.2024)

Finance & Accounts Officer
Mr. S.V. Kasabe

Asstt. Finance & Accounts Officer
Mr. Pradeep Kumar (wef 22.08.2024)

Asstt. Admn .Officer
Ms. C.S. Khundol (wef 31.01.2024)
Mrs. Swati S. Koli
Mr. V.S. Kuveskar
Mr. Suraj Gupta
Mr. Devendra V. Raorane
Mrs. Sanyuja S. Parab
Mr. A.G. Kolambkar

Principal Private Secretary
Mr. B. M. Chavan

Private Secretary
Mrs. Pragati R. Gadre

Stenographer (Grade – III)
Mr. Amey A. Sakpal

Assistant
Mrs. A.U. Joshi (upto 07.08.2024)
Mr. B.P. Chauhan
Mr. N.L. Ghane
Mr. M.B. Waghela
Mrs. Anu Grover
Mr. Saurabh Mahendra Jain (wef 30.08.2024)
Ms. Shivani Modi (wef 09.10.2024)
Mr. Sumit Singh Phartyal (wef 03.09.2024)
Mr. Surender (wef 26.09.2024)
Mr. Vineet Kumar Yadav (wef 30.09.2024)
Ms. Aruna Kumawat (wef 30.08.2024)
Mr. Ramniwas (wef 03.09.2024)
Mr. Himanshu Singh (wef 26.09.2024)

Upper Division Clerk
Mrs. C.C. Raut
Mr. S.H. Bhosale
Mr. Shirish P. Malvankar
Mr. Prasenjit P. Sonawane
Mr. Raju N. Kamble

Lower Division Clerk
Mr. Ninad V. Kandalgaonkar
Mr. Sambhaji S. Shelke
Ms. Ujjawala V. Tiwari

Multi-Tasking Staff
Mr. G.G. Zendekar (upto 10.01.2024)

Mr. J.K. Makwana
Mr. Ankush R. Dore (upto 31.07.2024)
Mr. M.P. Kotian
Mr. Ashok R. Shingade
Mr. Jagdish N. Dhanu
Mr. Vasant N. Ondkar
Mr. Arvind M. Lavande (upto 02.01.2024)
Mr. Vinod Kumar Yadav (upto 29.02.2024)
Mrs. R.H. Chavan (upto 02.01.2024)
Mr. Ankush N. Joyashi (upto 02.01.2024)
Mr. Ganesh N. Zendekar
Mr. Anil D. Sonawane
Mrs. Reshma Naik (upto 02.01.2024)
Mrs. Sabita Devi
Mr. Akhtar Fakirmiyan Mullaji
Mr. Vaibhav Milan Tawade (wef 01.08.2024)

CIFE Kakinada Centre

Scientific Staff

Officer Incharge / Senior Scientist
Dr. Muralidhar P. Ande
Senior Scientist
Dr. Karthireddy Syamala
Scientist
Dr.(Mrs.) Shamna N.

Technical Staff

Chief Technical Officer (T-9)
Dr. P. Srinivasa Rao (upto 31.05.2024)
Technical Assistants (T-4)
Mrs. Usharani Maradana (wef 23.07.2023)
Sr. Technicians (T-2)
Mr. Sheikh Valisha
Mr. G.V.V. Satyanarayana
Technicians (T-1)
Mr. Amit Kumar Verma (wef 01.05.2024)
Mr. Rajeev (wef 03.05.2024)

Administrative Staff

Asst. Administrative Officer
Mr. B. Laxmana Rao (upto 31.03.2024)
Upper Division Clerk
Mrs. M. Rama Mani

Multi-Tasking Staff

Mr. T. Satyanarayana
Mr. P.D. Reddy (upto 31.10.2024)
Mr. Kurru Suresh
Mr. M. Kondala Rao (Terminated on 12.09.2024)

CIFE Kolkata Centre

Scientific Staff

Officer Incharge / Principal Scientist
Dr.Tapas Kumar Ghoshal
Principal Scientist
Dr. G.H. Pailan
Dr. Parimal Sardar
Dr. S. Das Gupta
Dr. Gouranga Biswas
Sr. Scientist
Dr. Sujatha Sahoo
Scientist
Dr. Dilip Kumar Singh
Dr. Suman Manna
Dr. Hanjabam Mandakini Devi
Ms Sweta Pradhan
Dr. Leessa Priyadarsani

Technical Staff

Asstt. Chief Technical Officer (T-7/8)
Mr. Sanjeevan Kumar (wef 26.05.2021)
Technical Officer (T-5)
Mr. Prakash Kumar Behera (wef 01.02.2024)
Mr. Tapas Kumar Ghosh
Technical Officer (T-3)
Shri Partha Das (wef 15.02.2024)

Administrative Staff

Assistant Administrative Officer
Mr. C.N. Sahani (upto 31.05.2024)
Private Secretary
Ms. Kaberi Biswas (upto 31.01.2024)

Upper Division Clerk
Mr. Kishore Bose
Mr. Ram Milan Singh

Multi-Tasking Staff

Mrs. Suman Pandey
Mr. Rajesh Mahato

CIFE Powerkheda Centre

Scientific Staff

Officer Incharge/ Scientist
Dr. Sunil Kumar Nayak (upto 25.06.2024)
Dr. Shashi Bhushan (wef 19.06.2024)
Scientist
Mr. Dhalongsaih Reang
Dr. Harsha Haridas

Technical Staff

Asstt. Chief Technical Officer (T-7/8)
Mr. Hasan Javed
Technical Assistant (T-4)
Mr. Raghuvir Prasad (wef 01.01.2024)
Sr. Technician (T-2)
Mr. S. Prajapati
Technician (T-1)
Mr. Raghuveer Singh Meena (wef 29.04.2024)

Administrative Staff

Assistant Administrative Officer
Mrs. Asha Dhurve
Assistant
Mr. Devesh Tripathi (wef 03.09.2024)

Multi-Tasking Staff

Mr. Sambhu Dayal (upto 30.06.2024)
Mr. Manohar Lal
Mr. Ram Swarup
Mr. Deepak Kumar Kushwaha

Scientific Staff

Officer Incharge/ Scientist

Dr. Babitha Rani A.M. (upto 25.06.2024)
Dr. Mujahid Khan Pathan (wef 07.08.2024)

Scientist

Dr. Pankaj Kumar
Dr. Sreedharan K.
Mr. Satya Prakash (study leave wef 1.04.2021)

Technical Staff

Sr. Technical Officer (T-6)

Mr. Ashok Kumar

Technical Officer (T-5)

Mr. Satyendra Singh

Sr. Technical Assistant (T-4)

Mr. Krishan Kumar

Technical Assistant (T-3)

Shri Kuldeep Singh (wef 12.05.2024)

Technician (T-1)

Mr. Gyan Chand (wef 03.01.2024)
Mr. Munesh Agrawal (wef 08.05.2024)

Administrative Staff

Assistant

Ms. Neha (wef 20.08.2024)

Private Secretary

Mr. Pravin Ninawe (upto 30.11.2023)

Multi-Tasking Staff

Mr. Gyan Chand (upto 02.01.2024)

CIFE Rohtak Centre

CIFE Motipur Centre

Scientific Staff

Officer Incharge/ Sr. Scientist

Dr. Mohd. Aklakur

Scientist

Mr. Udipta Roy

Technical Staff

Technician (T-1)

Mr. Deepak Kumar (wef 17.05.2024)

Administrative Staff

Assistant

Mr. Harkesh Meena (wef 07.10.2024)

5.2. Appointments and Promotions

Appointments

Sl. No.	Name of the Officials	Designation	Date of Joining
1	Shri Jagdeesan A.K	Joint Director (OL)	01.01.2024
2	Shri Prakash Kumar Behera	Technical Officer, Kolkata Centre	01.02.2024
3	Shri Partha Das	Technical Assistant, Kolkata Centre	15.02.2024
4	Shri Sahil Yadav	Administrative Officer	23.04.2024
5	Shri Raghuveer Singh Meena	Technician, Powarkheda Centre	29.04.2024
6	Shri Amit Kumar Verma	Technician, Kakinada Centre	01.05.2024
7	Shri Amit Kumar	Technician	01.05.2024
8	Shri Nitish Singh	Technician	03.05.2024
9	Shri Akshay Parag Aate	Technician	03.05.2024 AN
10	Shri Rajeev	Technician, Kakinada Centre	03.05.2024
11	Shri Satya Prakash	Technician	06.05.2024
12	Shri Vikash Kumar	Technician	06.05.2024
13	Shri Pritam Kumar	Technician	06.05.2024
14	Shri Simant Kumar	Technician	06.05.2024
15	Shri Munesh Agrawal	Technician, Rohtak Centre	08.05.2024
16	Shri Deepak Kumar	Technician, Motipur Centre	17.05.2024
17	Shri Vaibhav Milan Tawade	Multi-Tasking Staff	01.08.2024
18	Shri Pradeep Kumar	Asstt. Finance & Accounts Officer	22.08.2024
19	Ms. Neha	Assistant, Rohtak Centre	20.08.2024
20	Shri Saurabh Mahendra Jain	Assistant	30.08.2024
21	Ms. Aruna Kumawat	Assistant	30.08.2024
22	Shri Sumit Singh Phartyal	Assistant	03.09.2024
23	Shri Ramniwas	Assistant	03.09.2024
24	Shri Devesh Tripathi	Assistant,Powarkheda Centre	03.09.2024
25	Shri Surender	Assistant	26.09.2024
26	Shri Himanshu Singh	Assistant	26.09.2024
27	Shri Vineet Kumar Yadav	Assistant	30.09.2024
28	Shri Harkesh Meena	Assistant, Motipur Centre	07.10.2024
29	Ms. Shivani Modi	Assistant	09.10.2024

Promotions

Sl. No.	Name of the Employee	From	To	w.e.f.
1	Shri Arvind M. Lavande	SSS	Technician (T-1)	03.01.2024
2	Shri Gyan Chand	SSS, Powarkheda Centre	Technician (T-1)	03.01.2024
3	Smt. R.H. Chavan	SSS	Technician (T-1)	03.01.2024
4	Shri Ankush N. Joyashi	SSS	Technician (T-1)	03.01.2024
5	Mrs. Reshma Naik	SSS	Technician (T-1)	03.01.2024

Five Yearly Assessment Meeting

S. No.	Name of the Employee	From	To	w.e.f.
Workshop Group III Category I & II				
1	Shri Dhanpat Singh Rawat	Sr. Tech. Assistant (T-4)	Technical Officer (T-5)	06.04.2024
2	Shri Abhijit Vijay Jadhav	Sr. Technician (T-2)	Technical Assistant (T-3)	19.08.2023
Laboratory Technician Group II Category I & II				
3	Mrs. Reshma Raje	Sr. Tech. Assistant (T-4)	Technical Officer (T-5)	29.08.2023
Laboratory Technician Group II Category III				
4	Dr. Nalini Poojary	Chief Tech. Officer (T-9)	One Advance Increment	17.12.2023
5	Shri Sanjeevan Kumar Kolkata Centre	Sr. Tech. Officer (T-6)	Asstt. Chief Tech. Officer (T-7/8)	26.05.2021
Photography Group V Category III				
6	Dr. D. Bhoomaiah	Chief Tech. Officer (T-9)	One Advance Increment	04.12.2022
Press & Editorial Group VII Category III				
7	Shri Pratap Kumar Das	Chief Tech. Officer (T-9)	One Advance Increment	15.10.2023
8	Mrs. Rekha Nair	Asstt. Chief Tech. Officer (T-7/8)	Chief Tech. Officer (T-9)	28.06.2024
Field & Farm Technician Group I Category I & II				
9	Shri Raghubir Prasad Powarkheda Centre	Tech. Assistant (T-3)	Sr. Tech. Assistant (T-4)	01.01.2024
10	Mrs. Usharani Maradana Kakinada Centre	Tech. Assistant (T-3)	Sr. Tech. Assistant (T-4)	23.07.2023
11	Shri Kuldeep Singh Rohtak Centre	Sr. Technician (T-2)	Tech. Assistant (T-3)	12.05.2024
Fishing Vessel Crew Category III				
12	Shri S. Maity	Sr. Tech. Officer (T-6)	Asstt. Chief Tech. Officer (T-7/8)	22.03.2024

Career Advancement Scheme for Promotion of Senior Scientist to Principal Scientist Vide ICAR Office Order No. Per.2(9)2017/-AU dated 08.03.2024

Sl. No.	Name of the Employee	From	To	w.e.f.
1	Dr. Ajit Kumar Verma	Senior Scientist	Principal Scientist	21.04.2017

Career Advancement Scheme for Promotion of Senior Scientist to Principal Scientist Vide ICAR Office Order No. Per.2(Misc. ASRB)2023-AU dated 08.05.2024

Sl. No.	Name of the Employee	From	To	w.e.f.
2	Dr. Asha T. Landge	Senior Scientist	Principal Scientist	17.06.2021
3	Dr. Babitha Rani A.M.	Senior Scientist	Principal Scientist	07.01.2023
4	Dr. Sonwane Arvind Asaram	Senior Scientist	Principal Scientist	07.01.2023
5	Dr. Gouranga Biswas	Senior Scientist	Principal Scientist	08.01.2023

Career Advancement Scheme for Promotion of Scientist to Senior Scientist Vide ICAR Office Order No. Per.6-38/2015/-AU dated 11.06.2024

Sl. No.	Name of the Employee	From	To	w.e.f.
1	Dr. Karthireddy Syamala	Scientist	Senior Scientist	01.01.2023
2	Dr. Sunil Kumar Nayak	Scientist	Senior Scientist	01.01.2023
3	Dr. Mohd. Aklakur	Scientist	Senior Scientist	01.01.2023
4	Dr. Arun Sharma	Scientist	Senior Scientist	01.01.2023
5	Dr. Thongam I. Chanu	Scientist	Senior Scientist	01.01.2023
6	Dr. Sikendra Kumar	Scientist	Senior Scientist	01.01.2023
7	Dr. Shashi Bhushan	Scientist	Senior Scientist	01.01.2023
8	Dr. Mujahidkhan Pathan	Scientist	Senior Scientist	17.02.2023
9	Dr. Saurav Kumar	Scientist	Senior Scientist	27.02.2023
10	Dr. Tincy Varghese	Scientist	Senior Scientist	16.04.2023
11	Dr. Shivaji Argade	Scientist	Senior Scientist	01.07.2023

Career Advancement Scheme for Promotion of Scientist to the next Higher Grade vide Council Order No. 6-38/2015-AU dated 11.06.2024 and 08.08.2024

Sl. No.	Name of the Employee	Designation	w.e.f.
1	Dr. Manjusha L.	Senior Scientist (8000-9000)	11.05.2023
2	Dr. Vinod Kumar Yadav	Senior Scientist (8000-9000)	15.12.2023
3	Dr. Deepitha R.P.	Scientist (6000-7000)	23.01.2023
4	Dr. Harsha Haridas	Scientist (6000-7000)	08.04.2023

Transfers from CIFE

Sl. No.	Name of the Employee	Transfer to	Date of Relieving
1	Dr. Chandrakant M.H. Asstt. Chief Tech. Officer	ICAR-CRIDA, Hyderabad	19.02.2024
2	Shri Navin Kumar Sr. Administrative Officer	ICAR-CIRCOT, Mumbai	17.04.2024
3	Mr. Sadiq M. Mulla Sr. Technician	ICAR-CCARI, Goa	31.10.2024
4	Shri Yogesh R. Pathare Administrative Officer	ICAR-CIRCOT, Mumbai	31.12.2024

Transfers to CIFE

Sl. No.	Name of the Officials	Transfer from	Date of Joining
1	Shri Jagdeesan A.K., Joint Director (OL)	ICAR-IIHR, Bangalore	01.01.2024
2	Shri Prakash Kumar Behera, Technical Officer	ICAR-CIFA, Bhubaneswar	01.02.2024
3	Shri Partha Das, Technical Assistant (T-3)	ICAR-DCFR, Bhimtal	15.02.2024
4	Shri Vaibhav M. Tawade, Multi-Tasking Staff	ICAR-CMFRI, Mumbai	01.08.2024
5	Shri Pradeep Kumar, Asstt. Fin. & Accounts Officer	ICAR-NRCSS, Rajasthan	22.08.2024

Retirements/Termination/Resignation

Sl. No.	Name of the Employee	Date of Retirement
11	Shri G.G. Zendekar, Multi-Tasking Staff	10.01.2024 (VRS)
2	Ms. Kaberi Biswas, Private Secretary, Kolkata Centre	31.01.2024 (VRS)
3	Ms. Chandrarekha Khundol, Asstt. Admn. Officer	31.01.2024
4	Shri Vinod Kumar Yadav, Multi-Tasking Staff	29.02.2024
5	Dr. K. Pani Prasad, Principal Scientist	08.03.2024 (VRS)
6	Shri B. Laxmana Rao, AAO, Kakinada Centre	31.03.2024
7	Dr. K.V. Rajendran, Principal Scientist	31.05.2024
8	Shri C. N. Sahani, AAO, Kolkata Centre	31.05.2024
9	Shri P. Srinivasa Rao, CTO, Kakinada Centre	31.05.2024
10	Shri Shambu Dayal, MTS, Powarkheda Centre	30.06.2024
11	Shri Dhanpat Singh Rawat, Technical Officer	31.07.2024
12	Shri Ankush Dhore, Multi-Tasking Staff	31.07.2024
13	Mrs. Anagha U. Joshi, Assistant	07.08.2024 (VRS)
14	Shri Vikash Kumar, Technician (T-1)	10.09.2024 (Resigned)
15	Dr. Dhamotharan K., Scientist	18.06.2024 (Dismissed)
16	Shri M. Kondala Rao, MTS, Kakinada Centre	12.09.2024 (Terminate)
17	Shri P. Dora Reddy, MTS, Kakinada Centre	31.10.2024
18	Dr. Ashok Kumar Jaiswar, Principal Scientist	31.12.2024

5.3 Training & Capacity Building of Faculty

Name of the facultyp	Name of the training programme attended	Organizer and Place	Period
Vinod Kumar Yadav	Blockchain for Indursty 4.0: Future Indurial revolution in decentralized manufacturing	Online	15-19 Jan, 2024
Vinod Kumar Yadav	Research Advancements in Natural Language Processing	Online	29 Jan-02 Feb, 2024
Madhuri S. Pathak	Winter school on "Harnessing Recent Advances in High-Value Compound Development and Seaweed Biomass Utilization for Human Well-being: Propelling Atmanirbhar Swastha Bharat and Empowering Farmers"	ICAR-CMFRI, Kochi	15 Feb - 6 Mar, 2024
Megha Bedekar Sukham Monalisha Devi Saloni Shivam Bharathhi Rathinam Nalini Poojary Abuthagir Iburahim.S Dayal Devadas	Three-days training programme on "ISO/IEC 17025: 2017 Standard and Internal Auditing"	ICAR-CIFE, Mumbai	26-28 Mar, 2024
Arpita Sharma	Executive Development Programme (EDP) on Leadership Building for Directors of Extension Education (DEEs) of State Agricultural Universities (SAUs)	ICAR-NAARM, Hyderabad	10-12 Jul, 2024
Vinod Kumar Yadav	Blockchain technology and its application	Online	22 - 31 Jul, 2024
Dayal Devadas	Training Programme on Multivariate Analysis Using R	ICAR – NAARM, Hyderabad	24-30 Aug, 2024
Abuthagir Iburahim.S	Training Title: Taxidermy Techniques for Wildlife	Mumbai Veterinary College, Goregoan	21-30 Aug, 2024
Bharathi Rathinam	Hands-on training on 'Bioinformatics Essentials: Navigating Integrative Omics Data'	ICAR-CIFE, Mumbai	30 Aug-03 Sept, 2024

5.4. Conference / Symposium / Workshop Attended by Scientists

Name of the faculty	Name of the Programme attended	Venue	Organized by	Date
Babitha Rani A. M.	Review of saline water shrimp aquaculture in the states of Haryana, Punjab, Rajasthan and Uttar Pradesh	Online	Department of Fisheries, Govt. of India	03 Jan, 2024
Manjusha L.	International Conference on Microbiological Research: Current Challenges and Future Perspectives I(CMR-CCFP)	Bharatidasan University, Thiruchirapalli	Bharatidasan University & Microbiologists Society India	09-11 January 2024
Saurav Kumar Dayal Devadas	DST sponsored seminar on seafood safety and public health	ICAR-CIFE, Mumbai	ICAR-CIFE, Mumbai	04-05 Jan, 2024
T.K. Ghoshal	Advisor in '2nd Acharya Prafulla Chandra Roy Smarak Vigyan Mela O Pradashani'	WBUAFS, Belgachia, Kolkata	WBUAFS	05-07 Jan, 2024
G. Biswas	Current Trends in Sustainable & Profitable Aquaculture	WBUAFS, Kolkata	WBPFGA & WBUAFS, Kolkata	12-13 Jan, 2024
Manjusha L.	International Fisheries Conference & Expo 2024	KUFOS, Kochi	KUFOS & COFPAA	12-14 Jan, 2024
T. K. Ghoshal	International Conference on "Sustainable Animal Nutrition for Global Health and Production: Innovations and direction	Madras Veterinary College, TANUVAS, Chennai	Madras Veterinary College & Animal Nutrition Society of India	23-25 Jan, 2024
Shamna N	BIMSTEC-India Marine Research Network (BIMReN) Online Networking Workshop	Online	BoBP	29 Jan, 2024
T. K. Ghoshal G. H. Pailan P. Sardar G. Biswas Sujata Sahoo H. Mandakini Devi D.K. Singh, Suman Manna L. Priyadarsani Sweta Pradhan	Farmers Business Summit-2024	ICAR-CIFE, Kolkata	Sundarban Dreams & ICAR-CIFE	31 Jan, 2024
Saurav Kumar	Meeting on ICAR fisheries research institutes on research programmes: mutual learnings and collaboration	ICAR-CIFE, Mumbai	ICAR-CIFE, Mumbai	01 Feb, 2024

R. Bharathi Rathinam	Meeting on ICAR Fisheries research Institute on research programmes: Mutual learnings and Collaboration	ICAR-CIFE, Mumbai	ICAR-CIFE, Mumbai	01 Feb, 2024
Gayatri Tripathi	Assessment Committee Meeting	ICAR-CIARI, Port Blair	ICAR-CIARI, Port Blair	8 Feb, 2024
S. Munilkumar	ICAR Regional Committee for Zone VIII	National Institute of Ocean Technology (NIOT) Campus, Chennai	ICAR-Central Marine Fisheries Research Institute, Kochi	16 Feb, 2024
C. N. Ravishankar N. P. Sahu Kedar Nath Mohanta Gayatri Tripathi Subodh Gupta Prem Kumar Tincy Varghese Debajit Sarma T. I. Chanu Shamna N. T.K. Ghoshal G.H. Pailan P. Sardar G. Biswas Sujata Sahoo H. Mandakini Devi D. K. Singh Suman Manna L. Priyadarsani Mrs. Sweta Pradhan. Sreedharan K. Shashi Bhushan Harsha Haridas Prem Kumar Shamna N.	13th IFAF-Fostering Indian Fisheries and Aquaculture for Attending sustainable development	ICAR-CIFRI	CIFRI and Asian Fisheries Society	23-25 Feb, 2024
Muralidhar P. Ande	Midterm review meeting of XXVI RCM-II	Online	ICAR-NRRI, Cuttack	01 Mar, 2024
Vinod Kumar Yadav	9th International Conference on “Current Approaches in Agricultural, Biological and Applied Sciences for Sustainable Development (CAABASSD-2024)”	Kumaun University, Nainital, Uttarakhan, India.	Faculty of Agriculture and Agroforestry, Kumaun University, Nainital,	01-03 Mar, 2024
Sukham Monalisha Devi	International workshop on fisheries management and ecology: fostering knowledge exchange	Online	Manipur University, Canchipur, Imphal	07-09 Mar, 2024

Sukham Monalisha Devi	District Strategic Plan Meeting held at Collector Office, Mumbai	Collector Office, Mumbai	DPO Mumbai City	07 Mar, 2024
Shamna N	BLP Master Trainer Workshops – Next Phase of Blended Learning Platform Implementation Training	Online	NAHEP, IASRI	13-14 Mar, 2024
Sanath Kumar H.	EFFECT- "Efficient Food-Processing for Environment and Climate-Changing Trends"	National Agricultural Science Complex	NIFTEM	15-16 May, 2024
Sanath Kumar H.	Launch workshop of AMR-AINP (Antimicrobial Resistance-All India Network Project)	National Agricultural Science Complex	ICAR	21 May, 2024
Saurav Kumar	4th Institute Animal Ethics Committee meeting	ICAR-CIFE, Mumbai	ICAR-CIFE, Mumbai	27 May, 2024
Saurav Kumar	ABI COHORT-one aimed at enhancing entrepreneurship in the fisheries sector	ICAR-CIFE, Mumbai	ICAR-CIFE, Mumbai	31 May, 2024
Shashi Bhushan	Cohort One- Workshop	ICAR-CIFE, Mumbai	ABI Centre, ICAR-CIFE, Mumbai	30-31 May, 2024
Megha Bedekar	Nomination as Scrutiny cum evaluation committee member- Officer's Posts Selection	Karnataka Animal and Fisheries Science University, Bidar	Karnataka Animal and Fisheries Science University, Bidar	18-19 Jun, 2024
Shashi Bhushan Dhalongsaih Reang	State level Approval Monitoring Committee	Fish Farmers development Division, MP, Secretariat, Bhopal	Department of fisheries, Bhopal, Madhya Pradesh	21 Jun, 2024
Kapil Sukhdhane	Participated in meeting on sanction of cages for Sardar Sarovar reservoir organized of department of Fisheries, Maharashtra.	Department of Fisheries, Maharashtra	Department of Fisheries, Maharashtra	27 Jun, 2024
N. S. Nagpure	Meeting Maharashtra Gene Bank for evaluation of Project proposals	Online	Maharashtra State Biodiversity Board, Nagpur	03-05 Jul, 2024
Muralidhar P. Ande	Fisheries Summer Meet 2024', as a part of outreach activity under Pradhan Mantri Matsya Sampada Yojana (PMMSY).	Madurai, Tamil Nadu	NFDB	12 Jul, 2024
Annam Pavan Kumar	FSBI 2024 Annual Symposium on Advancing Fish Ecology, Management and Forecasting through Omics	Bilbao, Spain	Fisheries Society of British Isles	15 -19 Jul, 2024

Sreedharan K	26th Scientific Advisory Committee Meeting of KVK, Jhajjar	KVK Jhajjar	KVK Jhajjar	18 Jul, 2024
Gayatri Tripathi	International Conference on 'Synergistic Effect of Bioinformatics & Biological Science in Current Research & Development'	Uttar Pradesh	Govardhan enclave, Lucknow, Gevanam, Genomics, Lucknow	20-21 July, 2024
Muralidhar P. Ande	BOS meeting	Ideal college of arts and sciences, Kakinada, Andhra Pradesh	Ideal college of arts and sciences	29 Jul, 2024
Paramita Banerjee Sawant	National Stakeholders Consultation on "Sustainable Development of Ornamental Fisheries In India" organized by ICAR-CIFA, Bhubaneshwar	ICAR-CIFA, Bhubaneshwar	ICAR-CIFA, Bhubaneshwar with support of NFDB	01-02 Aug, 2024
Muralidhar P. Ande	One Day interactive workshop on skill development certificate courses of ICAR-CIFE	ICAR-CIFE Kolkata Centre	ICAR-CIFE Kolkata Centre	19 Aug, 2024
Muralidhar P. Ande T. K. Ghoshal	XXVII Meeting of ICAR Regional Committee (Zone II)	ICAR-NRRI, Cuttack	ICAR-NRRI, Cuttack	23 Aug, 2024
Paramita Banerjee Sawant Kapil Sukhdhane	Workshop on Agri Udaan 7.0 Road Show and Start Up Hunt	Agri Business Incubation Centre, ICAR CIFE Mumbai	NAARM, Hyderabad, a idea and ICAR-CIFE Mumbai	24 Aug, 2024
Mujahidkhan A. Pathan	Meeting of State Level Approval and Monitoring Committee (SLAMC) under Pradhan Mantri Matsya Sampada Yojana (PMMSY) for the year 2024-25.	Chandigarh	Fisheries Department, Government of Haryana	25 Aug, 2024
Muralidhar P. Ande	BOS meeting	Aditya degree college, Kakinada, Andhra Pradesh	Aditya degree college, Kakinada, Andhra Pradesh	04 Sept, 2024
Manjusha L.	International Conference on Frontier Areas of Science & Technology-2024 (ICFAST-2024)	IIT, Guwahati	IIT Guwahati & Indian JSPS Alumni Association	06-07 Sept, 2024
T.K. Ghoshal, Sujata Sahoo, H. Mandakini Devi	2nd International Conference on "Sustainable Fisheries & Aquatic Resource Management: Life below Water" (SFARM – 2024)	Kolkata	Central Calcutta Science and Culture Organization for Youth	12-14 Sept, 2024

G.H. Pailan	Stakeholders' Workshop on 'Securing Climatic Resilient Agricultural Production Systems in Ganges Delta'	ICAR- CSSRI, RRS, Canning Town	ICAR- CSSRI, RRS, Canning Town	13 Sept, 2024
Muralidhar P. Ande	BOS meeting	Adikavi Nanayya university, Rajahmundry, Andhra Pradesh	Adikavi Nanayya University	21 Sept, 2024
Paramita Banerjee Sawant Madhuri S. Pathak	Workshop on Harnessing Modern Tools for Smarter Documentation	ICAR-CIFE Mumbai in collaboration with ICAR DKMA, New Delhi	ICAR-CIFE, Mumbai	23 Sep, 2024
Madhuri S. Pathak	Launch ceremony of NAAS YUVA	Online	National Academy of Agriculture Science	25 Sep, 2024
T. K. Ghoshal	State level Stakeholder's Workshop on Implementation of TED in Trawl gears in West Bengal	Kenilworth Hotel, Kolkata	MPEDA, Kolkata	25 Sept, 2024
Babitha Rani A. M.	11th International Conference on Fisheries and Aquaculture, Bangkok, Thailand	Bangkok, Thailand (Hybrid)	TIIKM	26-27 Sept, 2024
Manjusha L.	National seminar: "Aqua Food Excellence: Innovations in Post-Harvest Fisheries	ICAR-CIFT, Kochi	ICAR-CIFT & SOFTI, Kochi	02-04 September 2024
Muralidhar P. Ande	HACCP training for seafood processing plant technicians	Kakinada, Andhra Pradesh	MPEDA, Kochi	07 Oct, 2024
M. D. Aklakur Udipta Roy	National seminar cum exhibition	Darbhanga	NRC, Makhana	17 Oct, 2024
T. I. Chanu	10th International conference on RAAEALSES (online)	Uttaranchal University, Dehradun	Uttaranchal University, Dehradun in collaboration with AEDS	23-25 Oct, 2024
H. Mandakini Devi	10th International Conference on "Recent Advances in Agriculture, Engineering, Applied life Science for Environmental Sustainability, 2024	Online	Agro Environmental Development Society, Uttar Pradesh	23-25 Oct, 2024
Sujata Sahoo	Award Ceremony-Presentation-Fisheries and Life Science Awards: 2024	Online	Society of Fisheries and Life Sciences (SFLS), College of Fisheries, Mangalore	24 Oct, 2024

Manjusha L.	5th International Conference on Bacteriophage Research and Antimicrobial Research	Bhavan's Research Centre-Microbiology, Mumbai	Bhavan's Research Centre-Microbiology, & Society for Bacteriophage Research and Therapy	08-09 November 2024
H. Mandakini Devi	National Seminar on Advances in Environmental Management for sustainable Fisheries & Livestock Production, 2024	Kishanganj	College of Fisheries, Kishanganj	18-19 Nov, 2024
M. D. Aklakur Udipta Roy	Advances in Environment Management for Sustainable Fisheries and Livestock Production	Kishanganj	COF, Kishanganj	19 Nov, 2024
Manjusha L.	National Webinar on "Battling Antimicrobial Resistance in Aquaculture: Who Holds the Key?"	Dr. M.G.R Fisheries College and Research Institute	Tamil Nadu Dr. J. Jayalalithaa Fisheries University	21 Nov, 2024
S. Munilkumar	ICAR Regional Committee Meeting (Region-I)	ICAR-Central Potato Research Institute, Shimla	ICAR-Central Potato Research Institute, Shimla	22 Nov, 2024
T. K. Ghoshal	Indo-German Workshop on Challenges and new opportunities in vaccine development for Aquaculture.	Grand Hotel, M.G. Road, Kochi, Kerala	Cochin University of Science and Technology, Kochi	27-29 Nov, 2024
Sreedharan K Pankaj Kumar Shri. Ashok Kumar	Shrimp Retail	Hotel Crowne Plaza, New Delhi	Aqua Post	05-06 Dec, 2024

5.6. List of faculties traveled abroad for training

Faculty	Program	Institute/Affiliation	Sponsored by	Country	Duration
Arpita Sharma	International Fishing Industry Safety and Health Conference, Rome, Italy	UN FAO, Northeast Centre for Occupational Health and Safety (NEC), National Institute of Occupational Safety and Health (NIOSH), USA	UN FAO Rome	Rome, Italy	8 - 12 Jan, 2024
Annam Pavan Kumar	Attending FSBI Annual symposium on Advancing Fish Ecology, Management and Forecasting through Omics	Fisheries Society of British Isles	Anusandhan National Research Foundation, Department of Science and Technology	Bilbao, Spain	15-19 July 2024

5.7. Meetings Attended by Director and Joint Director

Dr. C. N. Ravishankar, Director & Vice Chancellor

Name of Meeting	Organized by	Date
Review meeting on Inland Saline/Alkaline Aquaculture in UP, Haryana, Rajasthan and Punjab.	Department of Fisheries, Govt. of India. (Online)	03 Jan, 2024
Interaction meeting of the Secretary, DARE & DG, ICAR with ICAR Scientists.	ICAR (Online)	05 Jan, 2024
Valedictory Session of training programme entitled "Integrated Fish Farming Model: Duck And Desi Chicken Cum Fish Farming".	ICAR-CIFE and RRTC, Motipur (Online)	09 Jan, 2024
Lecture on "Relevance of Ideology of Swami Vivekananda and Sri. Ramakrishna Paramhansa in man making and Nation Building".	Dr. P. S. Brahmanand P. D, WTC, IARI (Online)	12 Jan, 2024
Chief Guest for a session and addressed the participants of 'AgrIP: Short course on Patents in Agriculture' organised by IPTM Unit of ICAR, New Delhi and the Zonal Technology Management - Agribusiness Incubation Centre.	ICAR-CIFT, Kochi (Online)	16 Jan, 2024
Agriculture Spraying Drone Demonstration at ICAR-CIFE.	ICAR-CIFE, Mumbai	17 Jan, 2024
Interaction meeting with Dr. S. L. Mehta, former DDG Education, ICAR.	ICAR-CIFE, Mumbai	19 Jan, 2024
Inaugural programme of Vesava Koli Seafood Festival	Versova, Mumbai	19 Jan, 2024
राजभाषा कार्यान्वयन समिति की 106 वीं बैठक में भाग लिया।	ICAR-CIFE, Mumbai	24 Jan, 2024
Research Advisory Committee meeting at ICAR-CIFE	ICAR-CIFE, Mumbai	02-03 Feb, 2024
Meeting with DUs regarding Fellowship/Scholarships under the Chairmanship of DDG (Edn.), ICAR	DDG, Education, ICAR (Online)	02 Feb, 2024
61st meeting of the Technical Committee of Authority (MPEDA)	MPEDA, Kochi	06 Feb, 2024
MoU signing ceremony with the Industries Department, Government of Maharashtra.	Government of Maharashtra, Pune	08 Feb, 2024
35th Meeting of National Agricultural Education Accreditation Board	DDG, Education, ICAR (Online)	08 Feb, 2024
ICAR- AUs Interaction meeting with Secretary, DARE and DG, ICAR	ICAR, New Delhi	10 Feb, 2024
Valedictory function - Short course on AgrIP jointly organized by IP & TM Unit ICAR & ZTM-ABI Centre, ICAR-CIFT	ICAR-CIFT, Kochi (Online)	15 Feb, 2024
हिन्दी कार्यशाला (विषय: राजभाषा कार्यान्वयन में सूचना प्रौद्योगिकी का उपयोग) में भाग लिया।	ICAR-CIFE, Mumbai	15 Feb, 2024
28th meeting of the ICAR Regional Committee for Zone VIII at Chennai.	ICAR, Chennai (Hybrid Mode)	16 Feb, 2024
Delivered a lecture in the "Matsya-Prani Samavesh Odisha 2024" organized by Fisheries & ARD Department, Govt of Odisha from 16-18 February 2024 at Bhubaneswar.	Govt of Odisha	16-18 Feb, 2024

Participated in the Inaugural Session of the Certificate Course on & "Risk Management Survey and Loss Assessment in Shrimp Farming' being jointly organised by ICAR-CIBA and ICAR-CIFE.	ICAR-CIBA, Chennai	20 Feb, 2024
Lead lecture in the Technical Session of 13th IFAF Conference organised by ICAR-CIFRI at Kolkata.	ICAR-CIFRI, Kolkata	23-25 Feb, 2024
Annual Conference of Vice Chancellors of AUs & Directors.	ICAR, New Delhi	26-27 Feb, 2024
95th Annual General Meeting of the ICAR under the Chairmanship of Hon'ble Agriculture and Farmers Welfare Minister.	ICAR, New Delhi	28 Feb, 2024
146th Authority meeting of MPEDA at Kochi	MPEDA, Kochi (Online)	01 Mar, 2024
33rd Governing Council meeting of the Network of Aquaculture Centres in Asia-Pacific (NACA) as desired by the DDG (FS), ICAR at New Delhi.	ICAR, New Delhi	05 Mar, 2024
Meeting with Prof. Karim M. Maredia, Asst. Dean & Director of International Programs from Michigan State University, USA regarding discussion on future collaboration between CIFE-Mumbai, BSKKV-Ratnagiri, and Michigan State University-USA.	ICAR-CIFE, Mumbai	10 Mar, 2024
Review meeting of NFDB under the chairmanship of Secretary (Fisheries), Government of India.	Ministry of Fisheries, Government of India	12 Mar, 2024
Chaired a technical session on & Specialty Oils and Fats, Confectionary, Nutraceuticals, Marine Products & and delivered a lecture in the 77th & 78th Annual Convention of OTAI and International Conference on "Application of Oils and Fats in FMCG Sector"	Dr. Ambedkar International Centre, New Delhi	15-16 Mar, 2024
136th Meeting of the Executive Council of NAAS at New Delhi.	NAAS, New Delhi.(Online)	16 Mar, 2024
61st Research Council (RC) meeting of CSIR-IITR as a Member.	CSIR-IITR, (Online)	22 Mar, 2024
Participated in the Agri Udaan 6.0 Demo Day Program organised by ICAR-NAARM	ICAR-CIFE, Mumbai	22 Mar, 2024
Interaction meeting with Foreign and Pravasi Fellows of the NAAS.	NAAS, New Delhi (Online)	22 Mar, 2024
One-day Refresher Training Program organised by Quality Council of India.	Ville Parle, Mumbai	23 Mar, 2024
Expenditure Review meeting convened by the DDG (FS)	DDG (FS), Online	26 Mar, 2024
ICAR-DARE meeting on Comprehensive Guidelines for the Foreign Visits of the Scientists/Officials of ICAR	ICAR, New Delhi (Online)	03 Apr, 2024
Attended meeting of the Special Academic Council organised by ICAR-CIFE, Mumbai	ICAR-CIFE, Mumbai	04 Apr, 2024
Organized XVII Convocation of ICAR-Central Institute of Fisheries Education, Mumbai.	ICAR-CIFE, Mumbai	05 Apr, 2024
Meeting on Eco regional programme under the chairmanship of DG, ICAR followed by ARMS presentation	ICAR, New Delhi (Online)	12 Apr, 2024

Project Management Committee meeting of NAHEP chaired by DG, ICAR.	ICAR, New Delhi (Online)	12 Apr, 2024
20th meeting of Food Hygiene, Safety Management and Other Systems Sectional Committee, FAD 15 at BIS, New Delhi.	New Delhi	15 Apr, 2024
Attended meeting convened by the Chairman, UGC with Vice Chancellors/ Registrars of Deemed to be Universities to discuss the implementation of UGC Regulations and other initiatives of NEP 2020 in an expeditious manner at New Delhi.	UGC, New Delhi	19 Apr, 2024
Conducted Institute Research Council Meeting of ICAR-Central Institute of Fisheries Education.	ICAR-CIFE, Mumbai	22-24 Apr, 2024
First meeting of Regional Advisory Council of India Soy Excellence Centre (SEC RAC Meeting) at Delhi.	New Delhi	25 Apr, 2024
Signed MoU between ICAR-CIFE and Falcon Marine Exports with regards to *Vannamei* shrimp feed developed by the Institute	ICAR-CIFE, Mumbai	29 Apr, 2024
Attended NABL Assessors' programme organised by NABL at CSIR-IITR, Lucknow	CSIR-IITR, Lucknow	30-04 May, 2024
राजभाषा कार्यान्वयन समिति की बैठक में भाग लिया।	ICAR-CIFE, Mumbai	06 May, 2024
Attended meeting regarding revision of ARS Syllabus under the Chairmanship of Dr. A. K. Srivastava, VC, DUVASU, Mathura.	DUVASU, Mathura. (Online)	09 May, 2024
Network Project on INFAAR Launch Workshop at NASC Complex, New Delhi.	ICAR, New Delhi	22 May, 2024
Meeting with chairs of committees constituted for organisation of 64th Foundation Day of ICAR-CIFE.	ICAR-CIFE, Mumbai	04 Jun, 2024
नगर राजभाषा कार्यान्वयन समिति, मुंबई – उत्तर की छमाही बैठक में भाग लिया।	ICAR-CIFE, Mumbai	04 Jun, 2024
Attended 31st Annual General Body Meeting and Foundation Day Lecture of the NAAS Academy at New Delhi.	NAAS, New Delhi	05 Jun, 2024
Meeting convened by the DDG (FS), ICAR to discuss different technical and administrative matters with the Directors of eight Fisheries Research Institutes and the Officers of SMD.	ICAR, New Delhi	06 Jun, 2024
Attended 62nd Technical Committee Meeting of MPEDA, Kochi.	MPEDA, Kochi	07 Jun, 2024
Participated as a Chief Guest on the occasion of World Accreditation Day 2024 and chaired the Technical Session organised by NABL.	NABL, Mumbai	10 Jun, 2024
Attended 70th Meeting of Board of Management of SKUAST-K at Srinagar.	SKUAST-K at Srinagar	11 Jun, 2024
2nd Meeting of the Steering Committee constituted for promotion of seafood Export hosted by MPEDA, Kochi.	MPEDA, Kochi. (Online)	12 Jun, 2024

State Level Workshop on Implementation of TED in Maharashtra organised by MPEDA in association with ICAR-CIFT and ICAR-CIFE.	ICAR-CIFE, Mumbai	14 Jun, 2024
Celebration of 64th Foundation Day of ICAR-Central Institute of Fisheries Education, Mumbai.	ICAR-CIFE, Mumbai	14 Jun, 2024
36th Meeting of National Agricultural Education Accreditation Board (NAEAB) of ICAR.	NAEAB, ICAR, New Delhi	20 Jun, 2024
Celebration of 10th International Day of Yoga	ICAR-CIFE, Mumbai	21 Jun, 2024
147th Authority Meeting of MPEDA at Kochi	MPEDA, Kochi (Online)	21 Jun, 2024
2nd round of Review Meeting of ICAR Institutes	ICAR, New Delhi. (Online)	21 Jun, 2024
Discussion on Budget for Agriculture organised by NAAS.	NAAS, New Delhi (Online)	24 Jun, 2024
Valedictory Program for the 7-day SCSP training on "Culture of Fish Seeds in Pline Semi Biofloc System" organised by ICAR-CIFE RRTC, Motipur.	ICAR-CIFE RRTC, Motipur (Online)	27 Jun, 2024
हिन्दी कार्यशाला "राजभाषा कार्यान्वयन: समस्या एवं समाधान" में भाग लिया। मुख्य वक्ता, श्रीमती सीमा चोपडा, भारतीय कृषि अनुसंधान परिषद, नई दिल्ली के पूर्व निदेशक (राजभाषा).	ICAR-CIFE, Mumbai	28 Jun, 2024
Meeting on 100 Days Action Plan and Five Year Targets convened by the Secretary, DARE & DG, ICAR.	ICAR, New Delhi. (Online)	28 Jun, 2024
Attended meeting on 100 Days Action Plan and Five Year Targets convened by the Secretary, DARE & DG, ICAR.	ICAR, New Delhi. (Online)	01 Jul, 2024
Meeting to discuss the settlement of disputes in connection with the Arbitration case between CIFE, Mumbai and M/s. IRCON International under the chairmanship of the DDG (FS), ICAR, New Delhi.	ICAR, New Delhi.	08 Jul, 2024
66th Council Meeting of the Asian Fisheries Society in Kuala Lumpur, Malaysia.	Kuala Lumpur, Malaysia	12 Jul, 2024
Arranged visit of Prof. S.P. Singh Baghel, Hon'ble Minister of State for Fisheries, Animal Husbandry & Dairying and Panchyati Raj, Govt. of India.	ICAR-CIFE, Mumbai	13 Jul, 2024
Participated in Farmers' Meet and Awareness Program on Feed Developed for Inland Saline Aquaculture and signed a MoU with Falcon Feed for Technology Transfer at ICAR - CIFE Centre, Rohtak.	ICAR- CIFE Centre, Rohtak	14 Jul, 2024
96th ICAR Foundation and Technology Day Ceremony & Valedictory Session at New Delhi.	ICAR, New Delhi.	16 Jul, 2024
Academia-Industry Conclave, a Brainstorming session on 'Entrepreneurial Opportunities in Aquatic Animal Health Management' organised under NAHEP by AEHM Division, ICAR-CIFE.	AEHM Division, ICAR-CIFE Mumbai	18 Jul, 2024
Meeting for Discussion on Budget in relation to the Agriculture Sector under the Chairmanship of Dr. Himanshu Pathak, President, NAAS.	NAAS, New Delhi	26 Jul, 2024

Brainstorming Session on "Empowering Student Entrepreneurs: Innovating Aquafeed for Sustainable Aquaculture" organised by FNBP Division, ICAR-CIFE	FNBP Division, ICAR-CIFE, Mumbai	29 Jul, 2024
Chaired Interface Workshop on "Fostering Student Entrepreneurship for Next Generation Aquaculture" Sponsored by NAHEP	Aquaculture Division of ICAR-CIFE, Mumbai	02 Aug, 2024
Attended Opening Ceremony of Trainee Hostel at CIFE Old Campus.	ICAR-CIFE, Mumbai	04 Aug, 2024
Inaugural Function of Five days training program on "Aqua Business Models for Promoting Aqua Preneurship" for farmers from the State of Bihar.	ICAR-RRC Motipur, CIFE (Online)	05 Aug, 2024
Dean's Conference for the Implementation of New Education Policy 2020 convened under NAHEP at CIFE, Mumbai.	ICAR-CIFE, Mumbai	06 Aug, 2024
Certificate Course on 'Shrimp crop insurance and loss assessment' and its Valedictory programme jointly organised by ICAR-CIBA and ICAR-CIFE at CIFE Kolkata.	ICAR-CIFE Centre, Kolkata	09 Aug, 2024
Farmers' Meeting organised by ICAR-CIBA at its Kakdwip Centre.	ICAR-Kakdwip Centre of CIBA	10 Aug, 2024
Meeting of the Advisory Committee for Global Food Regulators Summit (GFRS) convened by FSSAI, New Delhi.	FSSAI, New Delhi (Online)	12 Aug, 2024
Launch event of ASEAN-India Fellowship for Higher Education in Agriculture and Allied Sciences organised by ICAR at NASC Complex, New Delhi.	ICAR, New Delhi	14 Aug, 2024
Convened meeting to review the status of the MoU with the State Fisheries Department, Govt of Maharashtra.	ICAR-CIFE, Mumbai	16 Aug, 2024
Held discussion regarding Diploma and certificate courses, discussion with Dept. of Fisheries, West Bengal and Transfer of technology of fish feed at ICAR-CIFE Centre, Kolkata.	ICAR-CIFE Centre, Kolkata	19 Aug, 2024
Valedictory Function of the Training Programme on "Aqua Business Models for Promoting Aqua-preneurship" for farmers from Bihar.	ICAR-CIFE Centre Motipur, (Online)	21 Aug, 2024
MoU Signing with VAMNICOM to foster research, academic and extension collaboration between ICAR-CIFE and VAMNICOM.	ICAR-CIFE, Mumbai	26 Aug, 2024
हिन्दी चेतना मास उद्घाटन समारोह में भाग लिया।	ICAR-CIFE, Mumbai	02 Sep, 2024
Interaction meeting cum Vice-Chancellors' Conference convened by Education Division, ICAR under the chairmanship of Hon'ble Agriculture Minister, Govt. of India at Kanha Shantivanam, Hyderabad.	Kanha Shantivanam, Hyderabad	06 Sep, 2024
4th Central Corpus Fund Committee Meeting	ICAR, New Delhi (Online)	10 Sep, 2024
4th Anniversary celebration of Pradhan Mantri Matsya Sampada Yojana at Sushma Swaraj Bhawan, Chanakyapuri, New Delhi.	New Delhi	11 Sep, 2024

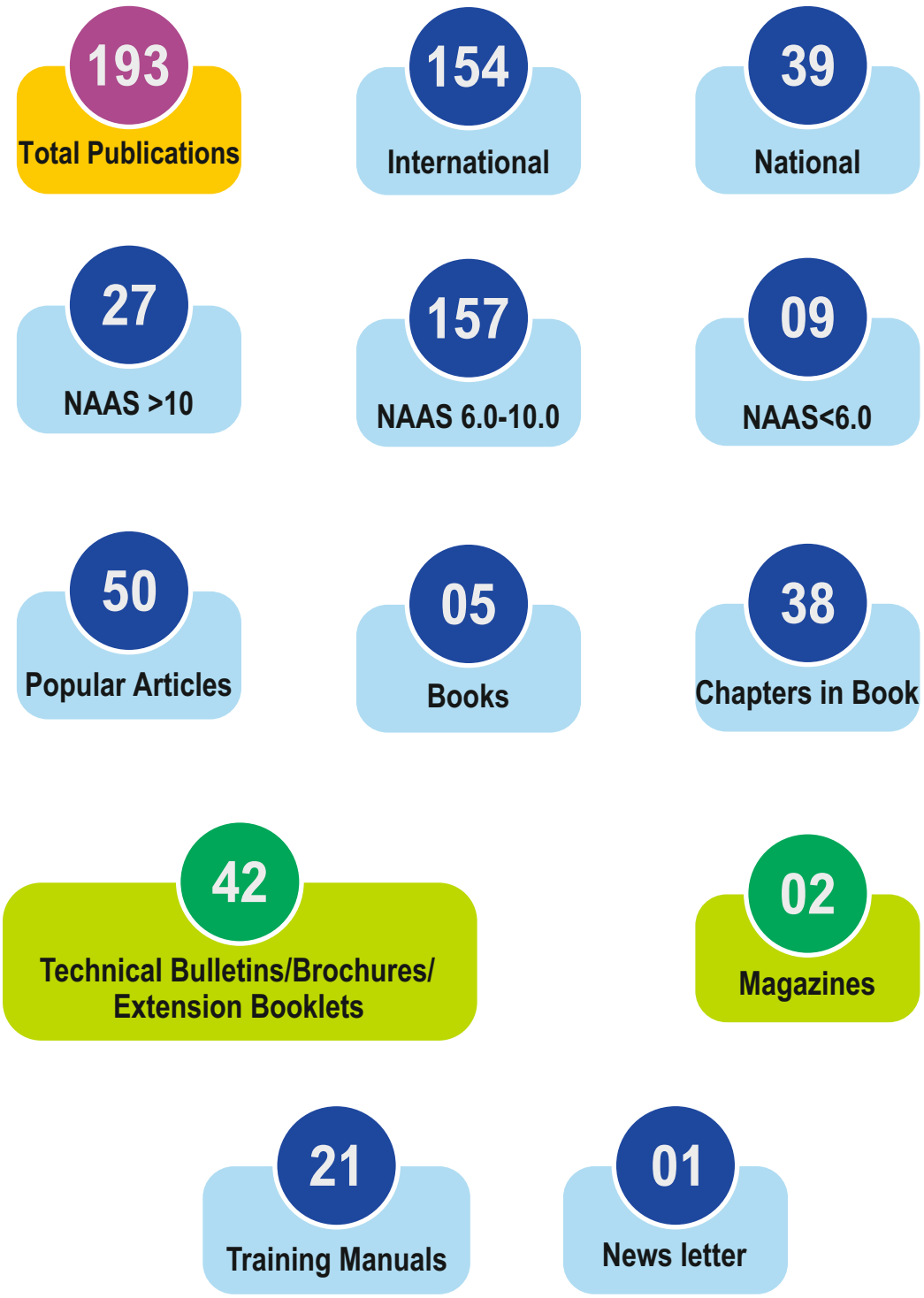
Meeting of Sectional Committee: FAD 15-Food Hygiene, Safety Management and Other Systems.	New Delhi (Online)	13 Sep, 2024
Participated as Chief Guest in the 9th Convocation of TNJFU, Nagapattinam	TNJFU, Nagapattinam	18 Sep, 2024
NAAS Executive Committee meeting.	NAAS, New Delhi	19 Sep, 2024
Coordinated Brainstorming Session on Cultivated Meat.	NAAS, New Delhi	20 Sep, 2024
Participated in Global Food Regulators Summit (GFRS)	FSSAI, New Delhi	20 Sep, 2024
One-day Workshop on Harnessing Modern Tools for Smarter Documents.	ICAR-CIFE, Mumbai	23 Sep, 2024
Participated as a Chief Guest in the Agri Udaan 7.0 roadshow/start-up hunt organised by ICAR-NAARM in collaboration with ICAR-CIFE, Mumbai.	ICAR-CIFE, Mumbai	24 Sep, 2024
Participated as Guest of Honour in the Inaugural Session of the National Conference on Blue Revolution for Sustainable Fisheries Development held during 25-27 September 2024 at KSTA office.	KSTA, Banglore	25-27 Sep, 2024
37th Meeting of National Agricultural Education Accreditation Board.	NAEAB, New Delhi (Online)	26 Sep, 2024
हिंदी चेतना मास का समापन एवं पुरस्कार वितरण समारोह में भाग लिया।	ICAR-CIFE, Mumbai	30 Sep, 2024
MCAER Meeting to discuss the issues regarding the nominations of all Dean and Director of four Agriculture Universities.	Mumbai (Online)	08 Oct, 2024
Attended a review meeting of the "All India Network Project on Ornamental Fish Breeding and Culture" convened by CMFRI, Kochi.	ICAR- CMFRI, Kochi	22 Oct, 2024
Chief Guest in the Valedictory function of the 5th International Conference on Bacteriophage Research & Antimicrobial Resistance (ICBRAR 2024) organised by the Department of Microbiology, Bhavan's College, Mumbai.	Department of Microbiology, Bhavan's College, Mumbai	09 Nov, 2024
Attended 49th meeting of the Scientific Committee of FSSAI.	FSSAI, New Delhi	12 Nov, 2024
Review Meeting convened under the Chairmanship of AS& FA DARE/ ICAR to review the expenditure plan and preparedness of Agricultural Education Division & ICAR DUs / IARI Hubs for the current financial year.	ICAR, New Delhi	18 Nov, 2024
Academic Core Committee meeting to discuss credit distribution and other academic issues.	ICAR, New Delhi	09 Dec, 2024

Dr. N. P. Sahu, Joint Director, ICAR-CIFE, Mumbai

Name of Meeting	Organized by	Date
Review meeting on Inland Saline/Alkaline Aquaculture in UP, Haryana, Rajasthan and Punjab.	Department of Fisheries, Govt. of India. (Online)	03 Jan, 2024
Interaction meeting of the Secretary, DARE & DG, ICAR with ICAR Scientists.	ICAR (Online)	05 Jan, 2024
Academic Council meeting of BASU Patna	BASU (Online)	11 Jan, 2024
Interaction meeting with Dr. S. L. Mehta, former DDG Education, ICAR.	ICAR-CIFE, Mumbai	19 Jan, 2024
राजभाषा कार्यान्वयन समिति की 106 वीं बैठक में भाग लिया।	ICAR-CIFE, Mumbai	24 Jan, 2024
Research Advisory Committee meeting at ICAR-CIFE	ICAR-CIFE, Mumbai	02-03 Feb, 2024
Attended and chair the session and to deliver lead lecture in the session on "Advances in fish nutrition research, nutraceuticals and nutrigenomics (Theme V)" at 13th Indian Fisheries and Aquaculture Forum: Fostering Indian Fisheries and Aquaculture for attaining Sustainable Development Goals, in Kolkata.	Kolkata	23-25 Feb, 2024
Delivered a Lead Lecture on "Advances in fish nutrition research, nutraceuticals and nutrigenomics (Theme V)" at 13th Indian Fisheries and Aquaculture Forum: Fostering Indian Fisheries and Aquaculture for attaining Sustainable Development Goals, in Kolkata, India	Kolkata	23-25 Feb, 2024
Annual Conference of Vice Chancellors of AUs & Directors.	ICAR, New Delhi	26-27 Feb, 2024
Expenditure Review meeting convened by the DDG (FS)	DDG (FS), Online	26 Mar, 2024
Organized XVII Convocation of ICAR-Central Institute of Fisheries Education, Mumbai.	ICAR-CIFE, Mumbai	05 Apr 2024
Academic Council meeting	ICAR-CIFE, Mumbai	06 Apr, 2024
Divisional Review Meeting	ICAR-CIFE, Mumbai	16-17 Apr, 2024
Attended meeting convened by the Chairman, UGC with Vice Chancellors/ Registrars of Deemed to be Universities to discuss the implementation of UGC Regulations and other initiatives of NEP 2020 in an expeditious manner at New Delhi.	UGC, New Delhi	19 Apr, 2024
Conducted Institute Research Council Meeting of ICAR-Central Institute of Fisheries Education.	ICAR-CIFE, Mumbai	22-24 Apr, 2024
Research Council of MAFSU as Member	MAFSU, Nagpur	29-30 Apr, 2024
राजभाषा कार्यान्वयन समिति की बैठक में भाग लिया।	ICAR-CIFE, Mumbai	06 May, 2024
Attended the 2nd meeting of 10th RAC-ICAR-CIARI, Port Blair	ICAR-CIARI, Port Blair	8 May, 2024
Synopsis Screening of M.F.Sc.	ICAR-CIFE, Mumbai	17 May, 2024
Meeting with Deputy Director General (Fisheries)	ICAR, New Delhi (Online)	27 May, 2024

Review meeting with DDG along with the Director at ICAR-NASC Complex New Delhi	ICAR, New Delhi	5 - 6 Jun, 2024
Attended the Fish Farmer Day & discussing administrative and other issue of the ICAR-CIFE Kolkata Centre	ICAR-CIFE Kolkata Centre	10 Jul, 2024
Interaction with Industry and Meeting with DDG along with All the directors of the Institutes	ICAR, New Delhi	16 Jul, 2024
Brainstorming Session on "Empowering Student Entrepreneurs: Innovating Aquafeed for Sustainable Aquaculture" organised by FNBP Division, ICAR-CIFE	ICAR-CIFE, Mumbai	29 Jul, 2024
संस्थान की राजभाषा कार्यान्वयन समिति की बैठकों का आयोजन	ICAR-CIFE, Mumbai	30 Jul, 2024
Chaired Interface Workshop on "Fostering Student Entrepreneurship for Next Generation Aquaculture" Sponsored by NAHEP	ICAR-CIFE, Mumbai	02 Aug, 2024
Dean's Conference for the Implementation of New Education Policy 2020 convened under NAHEP at CIFE, Mumbai	ICAR-CIFE, Mumbai	06 Aug, 2024
Conducted NAHEP Awareness Workshop on "Entrepreneurship Scope for Students in Environmental Impact Assessment	ICAR-CIFE, Mumbai	14 Aug, 2024
Attended meeting to Finalize the Certificate/ Diploma courses to be offered at different Centres of CIFE	ICAR-CIFE, Mumbai	19 Aug, 2024
Memorandum of Understanding with NRG Feed Kolkata for Commercialization of Technology "Leaf meal based carp feed"	ICAR-CIFE Kolkata Centre	19 Aug, 2024
One-day Workshop on Harnessing Modern Tools for Smarter Documents.	ICAR-CIFE, Mumbai	23 Sep, 2024
Attended as a Speaker for the conference titled Time to Look "Beyond the Conventional" Raw Materials	Auto Cluster Exhibition Center in Pune	24 Oct, 2024
संस्थान की राजभाषा कार्यान्वयन समिति की बैठकों का आयोजन	ICAR-CIFE, Mumbai	06 Nov, 2024
Conducted One-day Workshop on The Next Generation of Innovation: Youth Entrepreneurship for a Better Tomorrow	ICAR-CIFE, Mumbai	06 Nov, 2024
Conducted International Student Conference on Globalization On Fisheries Education: Challenges and Opportunities	ICAR-CIFE, Mumbai (Online)	21-22 Nov, 2024
Monthly ICAR SOC meeting	ICAR, New Delhi (Online)	06 Dec, 2024
Conducted Recruitment Fair: Unlocking Opportunities in the Thriving Aquaculture Sector	ICAR-CIFE, Mumbai (Offline & Online)	18 Dec, 2024

Chapter 6
Publications


193
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International
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National
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NAAS 6.0-10.0
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NAAS<6.0
50
Popular Articles
05
Books
38
Chapters in Book
42
Technical Bulletins/Brochures/
Extension Booklets
02
Magazines
21
Training Manuals
01
News letter

Peer Reviewed Publications with NAAS Rating and Impact Factor

Peer reviewed Research Publications NAAS ≥ 10.0

1. Acharya, A., Tripathi, G. and Bhat, R.A.H., 2024. Structural and functional characterization of haemoglobin genes in *Labeo catla*: Insights into hypoxic adaptation and survival. ***International Journal of Biological Macromolecules***, *281*, p.136235. (13.7: 7.70)

2. Arisekar, U., Shalini, R., Shakila, R.J., Iburahim, S.A., Anantharaja, K., Rathinam, R.B. and Sundhar, S., 2024. Selenium and mercury concentration, Se/Hg molar ratio and risk–benefit assessment of marine fish consumption: Human health risks and protective role of Se against Hg toxicity. ***Food Research International***, *180*, p.114086. (13.0: 7.0)

3. Arisekar, U., Shalini, R., Shakila, R.J., Sundhar, S., Banu, A.M.A., Iburahim, S.A. and Umamaheshwari, T., 2024. Trace metals in commercial seafood products (canned, pickled and smoked): Comparison, exposure and health risk assessment. ***Food Research International***, *178*, p.113969. (13.0: 7.0)

4. Gogoi, P., Das, S.K., Jana, C., Das, B.K., Saha, A., Ramteke, K., Jaiswar, A.K., Samanta, S. and Roshith, C.M., 2024. Assessing the trophic status of a tropical microtidal estuary applying TRIX and Random Forest–A combined approach. ***Marine Pollution Bulletin***, *200*, p.116126. (11.30: 5.30)

5. Goswami, M., Ovissipour, R., Bomkamp, C., Nitin, N., Lakra, W., Post, M. and Kaplan, D.L., 2024. Cell-cultivated aquatic food products: emerging production systems for seafood. ***Journal of Biological Engineering***, *18*(1), p.43. (11.70: 5.7)

6. Harini, G., Pathak, M.S., Munilkumar, S., Sukhdhane, K.S., Chanu, T.I., Balange, A.K. and Jeena, K., 2024. Unlocking synergies: Enhancing bioremediation, growth, and physiological responses of *Penaeus vannamei* co-cultured with seaweed. ***Algal Research***, *85*, p.103816. (10.6; 4.6)

7. Jaffer, Y.D., Bhat, I.A., Mir, I.N., Bhat, R.A.H., Sidiq, M.J. and Jana, P., 2024. Adaptation of cultured decapod crustaceans to changing salinities: Physiological responses, molecular mechanisms and disease implications. ***Reviews in Aquaculture***, *16*(4), pp.1520-1543. (14.8; 8.80)

8. Kantal, D., Kumar, S., Shukla, S.P., Karmakar, S., Jha, A.K., Singh, A.B. and Kumar, K., 2024. Chronic toxicity of sediment-bound triclosan on freshwater walking catfish *Clarias magur*: Organ level accumulation and selected enzyme biomarker responses. ***Environmental Pollution***, *351*, p.124108. (13.6; 7.6)

9. Karmakar, S., Kumar, K., Abraham, T.J., Kumar, S., Kumar, S., Shukla, S.P. and Dey, B., 2024. The role of environmentally relevant concentrations of oxytetracycline in the emergence of antimicrobial resistance in *Aeromonas hydrophila* and *Edwardsiella tarda*. ***Journal of Hazardous Materials Letters***, *5*, p.100130. (12.2; 6.2)

10. Kumar, G., Kumar, S., Paul, T., Pal, P., Shukla, S.P., Kumar, K., Jha, A.K. and Pradeep, S., 2024. Ecotoxicological risk assessment of triclosan, an emerging pollutant in a riverine and estuarine ecosystems: A comparative study. ***Marine Pollution Bulletin***, *205*, p.116667. (11.30: 5.30)

11. Lekshmi, M., Ortiz-Alegria, A., Kumar, S. and Varela, M.F., 2024. Major facilitator superfamily efflux pumps in human pathogens: Role in multidrug resistance and beyond. ***Current Research in Microbial Sciences***, p.100248. (10.8; 4.8)

12. Mahato, A., Chatterjee, P.N., Sarkar, S., Sen, A.R., Pal, A., Roy, S. and Patra, A.K., 2024. Effects of chemically and green synthesized zinc oxide nanoparticles on shelf life and sensory quality of minced fish (*Pangasius hypophthalmus*). ***Foods***, *13*(17), p.2810. (10.7; 4.7)

13. Mallik, A., Chakraborty, P., Ramteke, K.K., Bhavan, S.G., Jaiswar, A.K., Nayak, B.B., Pal, P. and Bhushan, S., 2024. Diet characteristics of tidal creek-associated fishes of the northeastern Arabian Sea with special reference to microplastic ingestion. ***Chemosphere***, *363*, p.142886. (14.10; 8.10)

14. Mohapatra, A., Trivedi, S., Kolte, A.P., Tejpal, C.S., Elavarasan, K., Vaswani, S., Malik, P.K., Ravishankar, C.N. and Bhatta, R., 2024. Effect of Padina gymnospora biowaste inclusion on in vitro methane production, feed fermentation, and microbial diversity. ***Frontiers in Microbiology***, *15*, p.1431131. (10.0; 4.0)

15. Mohanty, S., Paul, A., Banerjee, S., Rajendran, K.V., Tripathi, G., Das, P.C. and Sahoo, P.K., 2024. Ultrastructural, molecular and haemato-immunological changes: Multifaceted toxicological effects of microcystin-LR in rohu, *Labeo rohita*. ***Chemosphere***, 358, p.142097. (14.10; 8.10)

16. Ngasotter, S., Xavier, K.M., Porayil, L., Balange, A.K., Nayak, B.B. and Ninan, G., 2024. Facile green production of chitin nanomaterials from shrimp shell chitin using recyclable maleic acid and microwave irradiation. ***ACS Sustainable Chemistry & Engineering***, *12*(47), pp.17222-17235. (13.1; 7.10)

17. Nissa, M.U., Pinto, N., Ghosh, B., Banerjee, A., Singh, U., Goswami, M. and Srivastava, S., 2024. Proteomic insights into extracellular matrix dynamics in the intestine of *Labeo rohita* during *Aeromonas hydrophila* infection. ***Msystems***, *9*(10), pp.e00247-24. (11.0; 5.0)

18. Prakash, P., Munilkumar, S., Narsale, S.A., Marbaniang, B.J., Devi, G.A., Kadam, R., Malik, M.A., Sheikh, S., Mohanta, K.N., Baidya, S. and Debbarma, S., 2024. An improved recirculatory system model for culture of sludge worm: A cleaner innovative choice. ***Environmental Technology & Innovation***, *36*, p.103889. (12.7; 6.70)

19. Rishika, M.S., Kumar, S., Paul, T., Shukla, S.P., Bharti, V.S. and Kumar, K., 2024. Performance evaluation of sugarcane bagasse biochar based fixed bed column for removal of triclosan from aqueous solution in presence of humic acid: Mechanism, kinetics and safety. ***Journal of Water Process Engineering***, 64, p.105672. (12.30: 6.30)

20. Sawant, S.S., Bharti, V.S., Shukla, S.P., Kumar, K. and Bhuvaneswari, G.R., 2024. Evaluation of acute toxicity of an emerging contaminant Oxybenzone on an ecologically important aquatic macrophyte *Lemna minor*. ***Environmental Toxicology and Pharmacology***, *108*, p.104437. (10.2; 4.2)

21. Sharma, N., Das, B.K., Bhattacharjya, B.K., Chaudhari, A., Behera, B.K., Kumar, A.P. and Chakraborty, H.J., 2024. Metagenomic insights into microbial community, functional annotation, and antibiotic resistance genes in Himalayan Brahmaputra River sediment, India. ***Frontiers in Microbiology***, *15*, p.1426463. (10.0; 4.0)

22. Sharma, S., Majumdar, R.K., Mehta, N.K., Ngasotter, S. and Gaurav, K., 2024. Evaluating the efficacy of citrus fruit peel extract in preserving the quality of silver carp (*Hypophthalmichthys molitrix*) surimi during frozen storage. ***Journal of Agriculture and Food Research***, *18*, p.101440. (10.8; 4.8)

23. Singha, K.P., Sahu, N.P., Sardar, P., Shamna, N. and Kumar, V., 2024. A strategic roadmap for carbohydrate utilization in crustaceans feed. ***Reviews in Aquaculture***, 16(2), pp.674-705. (14.80; 8.60)

24. Sundaram, S.L.P., Radhakrishnan, K., Narayanakumar, R., Surya, S., Divu, D., Gopal, N., Kingsly, J., Leslie, V.A., Mojjada, S.K., Tade, M.S. and Subramanian, A., 2024. Energy efficiency and economics of small-scale fisheries (SSF) in India: A VIKOR based multicriteria decision-making model for sustainable fisheries management. ***Journal of Cleaner Production***, *450*, p.141864. (15.70; 9.70)

25. Venkatesh, S., Naidu, B.C., Palanisamy, S., Ngasotter, S., Shaju, S.S., Porayil, L., Balange, A., Nayak, B.B. and Xavier, K.M., 2024. Microplastic accumulation dynamics and risk assessment in dried fish processed with sea salt at different salting ratios. ***Journal of Hazardous Materials Advances***, *14*, p.100415. (11.5; 5.5)

26. Waghmare, S.D., Prakash, S., Sharma, A., Krishnani, K.K., Yadav, V.K. and Qureshi, N.W., 2024. Evaluating economic viability and environmental externalities of integrated tilapia-sugarcane farming in Maharashtra. ***Agricultural Water Management***, *302*, p.108967. (11.9; 5.9)

27. Wanjari, R.N., Ramteke, K.K., Bhavan, S.G., Nayak, B.B. and Deshmukhe, G., 2024. Delineating ecosystem structure and trophic organization to evaluate the health status of a tropical coastal region in the neighbourhood of Mumbai megacity. ***Ocean & Coastal Management***, *251*, p.107073. (10.8; 4.80)

Peer reviewed Research Publications
NAAS 10.0>8.0

1. Abass, Z., Shah, T.H., Bhat, F.A., Ramteke, K., Magloo, A.H., Hamid, I., Wanjari, R.N. and Somasundharam, I., 2024. The mahseer: The tiger of water-an angler's delight in the Himalayas and the undisputed king of sport fishing. ***Fisheries Research***, *279*, p.107147. (8.2: 2.2)

2. Adireddy, R.G., Manna, S., Patanjali, N., Singh, A., Dass, A., Mahanta, D. and Singh, V.K., 2024. Unveiling superabsorbent hydrogels efficacy through modified agronomic practices in soybean–wheat system under semi arid regions of South Asia. ***Journal of Agronomy and Crop Science***, *210*(4), p.e12730. (9.7: 3.7)

3. Akter, S., Nama, S., Wodeyar K, A., Deshmukhe, G., Nayak, B.B., Jaiswar, A.K., Landge, A.T. and Ramteke, K., 2024. Unraveling tropical estuary health through a multivariate analysis of spatiotemporal phytoplankton diversity and community structure in relation to environmental interactions. ***Aquatic Sciences***, *86*(4), p.109. (8.0: 2.0)

4. Arisekar, U., Shalini, R., Iburahim, S.A., Deepika, S., Reddy, C.P.K., Anantharaja, K., Albeshr, M.F., Ramkumar, S., Kalidass, B., Tamilarasan, K. and Kumar, N.N., 2024. Biomonitoring of mercury and selenium in commercially important shellfish: Distribution pattern, health benefit assessment and consumption advisories. ***Environmental Geochemistry and Health***, *46*(4), p.122. (9.2: 3.2)

5. Ashokan, A., Kumar, K., Deshmukhe, G., Deshmukh, R.R., Kumar, M.S. and Shukla, S.P., 2024. Modelling and optimization of phlorotannin extraction from *Stoechospermum marginatum* using response surface methodology and evaluating its activity against marine microfouling bacteria. ***Biomass Conversion and Biorefinery***, pp.1-17. (9.5: 3.5)

6. Ayyappan, M.V., Kishore, P., Panda, S.K., Kumar, A., Uchoi, D., Nadella, R.K., Priyadarshi, H., Obaiah, M.C., George, D., Hamza, M. and Ramannathan, S.K., 2024. Emergence of multidrug resistant, ctx negative seventh pandemic *Vibrio cholerae* O1 El Tor sequence type (ST) 69 in coastal water of Kerala, India. ***Scientific Reports***, *14*(1), p.2031. (9.8: 3.8)

7. Badhe, M.R., Das, P., Sahoo, S., Paul, A., Sahoo, P.K., Reddy, R.R.K., Suryawanshi, A.R., Nandanpawar, P.C., Das Mahapatra, K., Nagpure, N.S. and Goswami, M., 2024. Physiological responses to acute heat stress in rohu, *Labeo rohita*: Insights from liver proteomics. ***Marine Biotechnology***, *26*(6), pp.1129-1142. (8.6: 2.6)

8. Banjare, L.K., Saha, H., Acharya, A. and Khan, M.I.R., 2024. Investigating the impact of external application of formalin and potassium permanganate on hematological, immunological, and biochemical profiles in *Labeo rohita* fingerlings. ***Drug and Chemical Toxicology***, *47*(6), pp.974-986. (8.1: 2.1)

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Chapter 7
Honours & Awards

National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

CENTRAL INSTITUTE OF FISHERIES EDUCATION

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

PANCH MARG, YARI ROAD, VERSOVA, MUMBAI, MAHARASHTRA, INDIA

in the field of

TESTING

Certificate Number: TC-14607

Issue Date: 26/09/2024 **Valid Until:** 25/09/2026

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of thislaboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: ICAR-CENTRAL INSTITUTE OF FISHERIES EDUCATION

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

Appreciation certificates for successful commercialization of technologies

Date: 01 January 2024

- **CIFE-FLAVAC: Inactivated vaccine against *Flavobacterium columnare* for fish**
  Team: Dr. Megha Bedekar, Dr. Kundan Kumar, Dr. Saurav Kumar, Ms. Pooja Vinde, Dr. K.V. Rajendran, Dr. Gopal Krishna
- **CIFE-Ed-Vac: Inactivated vaccine against *Edwardsiella tarda* in fish**
  Team: Dr. Megha Kadam Bedekar, Dr. Kundan Kumar, Dr. Saurav Kumar, Mrs. Pooja M. Vinde, Dr. Rajendran K.V.
- **Inactivated vaccine CIFE-Aeromonas-V-Vac against *Aeromonas veronii* for use in fish**
  Team: Dr. Megha Kadam Bedekar, Mr. Sanjay Rathore, Dr. Haresh Gokalbhai Solanki, Dr. Gayatri Tripathi, Dr. Rajendran K.V.
- **The designs of the photobioreactors for microalgae culture**
  Team: Dr. S.P. Shukla, Dr. G.R. Bhuvaneswari, Mr. Sachin Belsare
- **Argunil: Ivermectin based medicated feed mix for treatment of fish parasites and growth restoration in fish**
  Team: Dr. Md Aklakur, Dr. A.K. Pal, Dr. N.P. Sahu
- **Prawn Pickle**
  Team: Dr. B.B. Nayak, Dr. A.K. Balange, Dr. M.K. Chouksey, Mr. Avinash Sable, Mr. Bhanudas Phande, Miss. Snehal Shitole, Miss. Pranita Chande
- **Laminated Bombay Duck**
  Team: Dr. B.B. Nayak, Dr. A.K. Balange, Mrs. Ajita Ghag, Dr. M. Thachil, Dr. R. Keluskar
- **Mechanical-cum-Biological Drum Filter**
  Team: Dr. A. K. Verma, Dr. Chandrakant, M.H., Dr. B. B. Nayak, Dr. Ashutosh D. Deo
- **Aquaponics**
  Team: Dr. A.K. Verma, Dr. Chandrakant, M.H.

Institutional Awards 2024

In order to recognize the significant contributions by the faculty, staff members and students of the institute to reward talent and promote team spirit, provide encouragement and inspiration for improved performances, ICAR-CIFE released annual institutional awards on 14th June 2024 and list of awardees are as following in various categories.

S.No	Awards	Awardee Name
1.	Best Scientist Award	Dr. S.P. Shukla
2	Best Young Scientist	Dr. Shamna M.
3	Best Division Award	Aquatic Environment and Health Management
4	Best Extension Scientist	Dr. Dilip Kumar Singh
5	Best Teacher	Dr. Tincy Varghese
6	Best Administrative Staff	Mrs. Asha Dhurve
7	Award for Institute Building	Dr. Kapil S. Sukhdhane
8	Award for Technology Commercialization	Rupam Sharma, Thongam Ibemcha Chanu, M.A. Pathan, Sunil Kumar Nayak and Girish Babu
9	Award for Technology Commercialization	Ajit Kumar Verma, M.H. Chandrakant, B.B. Nayak and Ashutosh Deo
10	Best Multi Tasking Staff	Mr. Ganesh N. Zendekar
11	Best Publication of the Year Award	Ajit Kumar Verma, M.H. Chandrakant, Venisza Cathy John, Roshan Maria Peter, Irene Elizabeth John
12	Best Scientist of Regional Centre ICAR-CIFE	Dr. Mujahindkhan A. Pathan
13	Best Centre of ICAR-CIFE	CIFE - Kolkata
14	Special Recognition from the Director	Mr. Shirish P. Malvankar Mr. Satyendra Kumar Singh Mr. Hasan Javed Mr. Dhanpat Singh Rawat Mrs. M. Rama Mani Mr. Kishore Bose Mr Manohar Lal

Awards and Appreciations

•Name of Faculty •Award/Honours •Awarded for •Received from •Date •Venue/occasion

January 2024

Dr. Shamna N
Best Oral Presentation Award
The paper "Changes in growth and immunity in L. rohita(Hamilton, 1822) fingerlings fed with diet containing cabbage and cauliflower waste meal". Shamna N., Kaleeswaran V., Manish Jayant, Parimal Sardar, K.N. Mohanta and N.P. Sahu.
International Fisheries Congress & Expo-2025
12-14 January 2024
Kochi, Kerala, India

February 2024

Dr. Manjusha L.
Best Oral Presentation
Paper presentation
Bharatidasan University, Trichy
09-11 February 2024
International Conference on Microbiological Research: Current Challenges and Future Perspectives (ICMR-CCFP 2024)

Dr. Shamna N
Best Poster Presentation Award
Evaluation of raw, fermented and exogenous enzyme supplemented tomato pomace meal in the diet of *L. rohita* (Hamilton, 1822). Sundi, S., Sardar, P. Shamna N., Sahu N.P. and Manjusha L.
13th Indian Fisheries & Aquaculture Forum
23-25 February 2024
Kolkata, West Bengal

Dr. Tincy Varghese
Best presentation award
Oral presentation
IFSI (Inland Fisheries Society of India)
23-25 Feb. 2024
13th IFAF, ICAR-CIFRI

Dr. Babitha Rani A M
Award
Best poster presentation
13th IFAF
23-2th February 2024
13th Indian Fisheries and Aquaculture Forum, Kolkata

March 2024

Dr. Saurav Kumar
Awarded the Best Article Award by The Science World Magazine
Popular article entitled "Biocide Resistance in Environmental Bacteria – Lesson from Triclosan Use"
The Science World Magazine
5 March 2024
The Science World Magazine

Dr. Vinod Kumar Yadav
Excellence in Research Award-2024
For outstanding contribution in the field of Agricultural Statistics
9th International Conference on "Current Approaches in Agricultural, Biological and Applied Sciences for Sustainable Development (CAABASSD-2024)"
01/03/2024 to 03/03/2024
Kumaun University, Nainital, Uttarakhand, India

Dr. Vinod Kumar Yadav
Best Presentation award
2nd price in Best oral Presentation
9th International Conference on "Current Approaches in Agricultural, Biological and Applied Sciences for Sustainable Development (CAABASSD-2024)"
01/03/2024 to 03/03/2024
Kumaun University, Nainital, Uttarakhand, India

July 2024

Dr. Prem Kumar
K. Chidambaram Memorial Annual Award-2023
Contribution in Popularization of Hatchery Seed Production and Farming Technology of Whisker Catfish, Mystus gulio for Rural Aquaculture
Fisheries Technocrats Forum Chennai
13.07.2024
Govt. Fisheries Department, Chennai

August 2024

Dr. Sujata Sahoo
Vet icon award 2024
Scientific Achievement Award
Indian Veterinary Association 96/1967
17 August 2024
Lucknow, India

October 2024

Dr. Manjusha L.
Fisheries and Life Science Awards: 2024
Best Scientist
Society of Fisheries and Life Sciences
30 October 2024
International Workshop on “Perspectives, Opportunities and Challenges for Research in Fisheries Sciences in a Changing Climate: A Workshop for Emerging Scientists”

Dr. MD Aklakur
1st prize in oral presentation
Oral Presentation
NRC, Makhana
17 October 2024
National seminar

Mr. Udipta Roy
3rd prize in poster presentation
Poster presentation
NRC, Makhana
17 October 2024
National seminar

November 2024

Dr. MD Aklakur
3rd prize in oral presentation
Oral Presentation
COF, Kishanganj
19 November 2024
National Seminar

Dr. Prem Kumar
Dr. V.G. Jhingran Gold Medal for Best Indian Scientist -2023
Fisheries Research, Teaching and Extension
College of Fisheries (BASU), Kishanganj, Bihar, India
18 November 2024
College of Fisheries (BASU), Kishanganj, Bihar, India

Dr. A.K. Verma
Indian Society for Agricultural Engineers (ISAE), Fellow (2024)
For outstanding contribution to the profession of Agricultural Engineering
Indian Society for Agricultural Engineers
12 November 2024
Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India.

December 2024

Dr. Manjusha L.
Fisheries and Life Science Awards: 2024
Best Teacher
Society of Fisheries and Life Sciences
30 October 2024
International Workshop on “Perspectives, Opportunities and Challenges for Research in Fisheries Sciences in a Changing Climate: A Workshop for Emerging Scientists”

Chapter 8
Linkages and Collaborations

8.1. Linkages

The Institute maintains linkages and collaborations with various national and international institutions and agencies for education, research and development.

Government of India Organizations

- Fishery Survey of India, Mumbai
- Central Institute of Fisheries Nautical and Engineering Training, Kochi
- Marine Products Export Development Authority, Kochi
- Zoological Survey of India, Kolkata
- Indian Institute of Technology, Kharagpur
- Department of Earth Sciences, New Delhi
- Department of Science and Technology, New Delhi
- Department of Biotechnology, New Delhi
- Indian National Center for Ocean Information Services, Hyderabad
- Satellite Application Centre, Ahmedabad
- Bhabha Atomic Research Centre, Mumbai
- Tata Cancer Research Center, Mumbai
- Indian Institute of Foreign Trade, Kolkata
- Tata Institute of Fundamental Research, Mumbai
- Krishi Vigyan Kendra, Banswara, Rajasthan
- Nuclear Power Corporation of India Limited, Mumbai
- National Bank for Agriculture and Rural Development, Mumbai

ICAR Institutes

- ICAR-Central Marine Fisheries Research Institute, Kochi
- ICAR-Central Institute of Brackishwater Aquaculture, Chennai
- ICAR-Central Institute of Freshwater Aquaculture, Bhubaneshwar
- ICAR-Central Inland Fisheries Research Institute, Barrackpore
- ICAR-Central Institute of Fisheries Technology, Kochi
- ICAR-National Bureau of Fish Genetic Resources, Lucknow
- ICAR-Directorate of Coldwater Fisheries Research, Bhimtal
- ICAR-National Academy of Agricultural Research Management, Hyderabad
- ICAR - Central Coastal Agricultural Research Institute, Goa
- ICAR Research Complex for Eastern Region, Patna
- ICAR Research Complex for North-Eastern Hill Region, Barapani
- ICAR-Indian Agricultural Research Institute, New Delhi
- ICAR-Central Institute of Agricultural Engineering, Bhopal
-

CSIR Institutes

- Central Drug Research Institute, Lucknow
- Central Institute of Medicinal and Aromatic Plants, Lucknow
- Central Food Technological Research Institute, Mysore
- National Institute of Oceanography, Goa
- Centre for Cellular and Molecular Biology, Hyderabad
- Institute of Genomics and Integrative Biology, New Delhi
- Indian Institute of Integrative Medicine, Jammu
- Indian Institute of Chemical Biology, Kolkata

International

- University of Idaho, Idaho, USA
- University of Kentucky, Lexington, KY, USA
- Curtin University, Australia

Universities

- Cochin University of Science and Technology, Kochi
- Annamalai University, Chidambaram
- Acharya N. G. Ranga University, Guntur
- B. S. Konkan Krishi Vidyapeeth, Dapoli
- Maharana Pratap University of Agriculture and Technology, Udaipur
- Jawaharlal Nehru University, New Delhi
- Mangalore University, Mangalore
- Bhartiyar University, Coimbatore
- West Bengal University of Animal & Fishery Sciences, Kolkata
- Mumbai University, Mumbai
- Bidhan Chardra Krishi Viswa Vidyalaya, Nadia, West Bengal
- Kalyani University, Kalyani, West Bengal
- Barkatullah University, Bhopal
- Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur
- Chhattisgarh Kamdhenu Vishwavidyalya, Chhattishgarh
- Babasaheb Bhimrao Ambedkar University, Lucknow
- Centre of Agriculture University, Imphal

State Governments

Department of Fisheries of the following states:

Maharashtra, Haryana, Uttar Pradesh, Bihar, Tamil Nadu, Andhra Pradesh, Tripura, Arunachal Pradesh, Madhya Pradesh, Meghala, Nagaland, Assam, Manipur, Mizoram, Sikkim, Punjab and Telangana

NGOs:

- Yusuf Meherally Centre, Kutch, Gujarat
- United Artists' Association, Ganjam, Odisha

Other Organizations

- Haryana Kishan Ayog, Chandigarh
- State Institute of Fisheries Technology, Kakinada
- Action Aid International, Port Blair
- M. S. Swaminathan Research Foundation, Chennai
- The Seafood Exporters Association of India, Kolkata
- Nezami Rekha Sea Foods Pvt. Ltd., Kolkata
- IFB Agro Industries Ltd., Aquatic & Marine
- Products Div., Kolkata
- Shimpo Exports, Kolkata
- Coreline Exports, Kolkata
- Digha Sea Food Exports, Kolkata
- NSZA Sea Food Pvt. Ltd, Kolkata
- Central Calcutta Science and Culture Organization for Youth, Kolkata
- APC Nutrient, Mumbai
- Godrej Agrovet Pvt. Ltd., Vijayawada
- Maharashtra Machimar Kriti Samiti, Mumbai
- Akhil Bhartiya Machimar Sanghatna, Mumbai
- Madhya Pradesh Fish Federation, CPWD, Bhopal, M.P.
- CPWD, Hoshanagabad, M.P.
- Telecom Department, M.P.
- State Electricity Board, M.P.
- Saguna Baugh Farm, Neral
- Tata Power Co. Mahseer Farm, Lonavla
- Govt. Fish Farm, Khopoli
- Arrey Fish Farm, Mumbai
- Shramajivi Janata Sahayyak Mandal, Mahad, Raigarh, Maharashtra

8.2. MoUs

1. ICAR-CIFE signed Umbrella MoU with the Department of Fisheries (DoF), Maharashtra, on 6th February 2024 in the presence of Honourable Shri. Sudhir Mungantiwar, Minister for Forests, Cultural Affairs, Fisheries, Government of Maharashtra
2. ICAR-CIFE, Mumbai, signs MoA with Agrocel Industries Pvt. Ltd., Kutch, Gujarat, on 27th March 2024 for Contract Research Service.
3. ICAR-CIFE signs an MoU with Government Polytechnic, Mumbai on use of AI and Machine learning in fish feed formulation and feed technology on 2 April, 2024
4. An Agreement for Consultancy Services was signed between ICAR-CIFE, Mumbai and Sensoact Innovations Pvt. Ltd., Mumbai to provide technical guidance on the production of Phycocyanin from Spirulina. The Memorandum of Agreement (MoA) was signed on April 29, 2024.
5. A MoU was signed on 18th July 2024 between Mr. Arindam Ghosh, Durgapur, West Bengal, and the ICAR-CIFE. The purpose of the MoU is to facilitate the transfer of technical know-how related to the development of value-added fish products, thereby promoting entrepreneurship and skill development in the fisheries sector.

6. A Memorandum of Agreement (MoA) was signed on 19th August 2024 between NRG Feed and the ICAR-CIFE for the commercialization of “CIFE Green” — a groundnut and Gokulkanta leaf meal-based aquafeed formulated for freshwater carp polyculture. This MoA aims to promote sustainable aquaculture practices by introducing innovative, plant-based feed solutions into the market through industry partnership
7. MoU signed with Bioxgreen Pvt. Ltd., TeOra Life Sciences Pvt. Ltd was signed on 8th October 2024 and J.M. Infra Pvt. Ltd on 16th October 2024. (Contract Services)
8. MoU for commercialisation of CIFEGloX between ICAR-CIFE, Mumbai and Mr Sanjay Agrawal, Director, RNAgarwal Trading LLP, Raipur, (Chhattisgarh) was signed on 24 oct 2024.

Chapter 9
Events and **Meetings**

Important Meetings

SNo.	Title	Venue	Date
1.	75th Republic Day	ICAR-CIFE, Mumbai & its regional centres	26 January 2024
2.	Research Advisory Committee	ICAR-CIFE, Mumbai	2-3 February 2024
3.	National Science Day	ICAR-CIFE, Mumbai	28 February 2024
4.	XVII Convocation of ICAR-CIFE	ICAR-CIFE, Mumbai	5 April 2024
5.	World Intellectual Property Day	ICAR-CIFE, Mumbai	26th April, 2024
6.	Institute Research Council Meeting	ICAR-CIFE, Mumbai	22-24 April 2024
7.	64th Annual Day of ICAR-CIFE	ICAR-CIFE, Mumbai	14 June 2024
8.	10th International Yoga Day	ICAR-CIFE, Mumbai & its regional centres	21 June 2024
9.	National Fish Farmers' Day	ICAR-CIFE, Kolkata Centre	10 July 2024
10.	Dean Conference for Implementation of NEP 2020 in Fisheries Education and Promoting Student Entrepreneurship	ICAR-CIFE, Mumbai	6 August 2024
11.	International Students' Conference on "Globalization of Fisheries Education: Challenges and Opportunities"	ICAR-CIFE, Mumbai	22-23 August 2024
12.	Academia-Industry Conclave Brainstorming Session on "Entrepreneurial Opportunities in Aquatic Animal Health Management"	ICAR-CIFE, Mumbai	18 July 2024
13.	Interface Workshop on "Fostering Student Entrepreneurship for Next Generation Aquaculture"	ICAR-CIFE, Mumbai	2 August 2024
14.	Awareness workshop on "Entrepreneurship Scope for Students in Environmental Impact Assessment"	ICAR-CIFE, Mumbai	14 August 2024
15.	78th Independence Day	ICAR-CIFE, Mumbai & its regional centres	15 August 2024
16.	Hindi Chetna Maas	ICAR-CIFE, Mumbai & its regional centres	2 -30 September 2024
17.	AGRI UDAAN® 7.0 Roadshow Hosted by a-IDEA	ICAR-CIFE, Mumbai	24 September 2024
18.	Rashtriya Ekta Diwas	ICAR-CIFE, Mumbai & its regional centres	31 October 2024
19.	The Next Generation of Innovation: Youth Entrepreneurship for a Better Tomorrow	ICAR-CIFE, Mumbai	14 November 2024
20.	The Constitution Day its regional centres	ICAR-CIFE, Mumbai &	26 November 2024
21.	हिन्दी कार्यशाला - प्रतिवेदन विषय - कार्यालयीन कार्य हिन्दी में कैसे करें?	ICAR-CIFE, Mumbai	5 December 2024
22.	Agriculture Education Day	ICAR-CIFE, Mumbai	3 December 2024
23.	Recruitment Fair: Unlocking Opportunities in the Thriving Aquaculture Sector	ICAR-CIFE, Mumbai	18 December 2024

राजभाषा गतिविधियाँ – 2024

संस्थान में 01 जनवरी 2024 से 31 दिसंबर 2024 के दौरान आयोजित राजभाषा गतिविधियों का विवरण निम्नलिखित है:

I) राजभाषा कार्यान्वयन समिति की बैठकें

संस्थान की राजभाषा कार्यान्वयन समिति की 106, 107, 108 और 109 वीं बैठकें क्रमश: दिनांक 24 जनवरी 2024, दिनांक 06 मई 2024, दिनांक 30 जुलाई 2024 और दिनांक 06 नवंबर 2024 को आयोजित की गईं।

II) हिन्दी कार्याशालाओं का आयोजन

1. दिनांक 15 फरवरी, 2024 को मुख्यालय के प्रशासनिक वर्ग के समस्त अधिकारियों एवं कर्मचारियों के लिए "राजभाषा कार्यान्वयन में सूचना प्रौद्योगिकी का उपयोग" विषय पर एक कार्यशाला का आयोजन किया गया, जिसमें संस्थान के संयुक्त निदेशक (राजभाषा) श्री जगदीशन, ए. के. ने उक्त विषय पर व्याख्यान दिया।

2. दिनांक 28 जून 2024 को संस्थान के निदेशक/कुलपति डॉ. रविशंकर, सी. एन. की अध्यक्षता में संस्थान के वैज्ञानिकों, अधिकारियों एवं कर्मचारियों हेतु "राजभाषा कार्यान्वयन : समस्या एवं समाधान" विषय पर हिन्दी कार्यशाला का आयोजन किया गया, जिसमें श्रीमती सीमा चोपड़ा, पूर्व निदेशक (राजभाषा), भारतीय कृषि अनुसंधान परिषद, नई दिल्ली ने उक्त विषय पर व्याख्यान दिया।

3. दिनांक 25 सितंबर 2024 को संस्थान के विभिन्न विभागों के लिए "राजभाषा तिमाही प्रगति रिपोर्ट का प्रोफार्मा कैसे भरें?" विषय पर एक कार्यशाला का आयोजन किया गया, जिसमें श्री जगदीशन ए. के. संयुक्त निदेशक (राजभाषा) ने उपस्थित प्रतिभागियों को राजभाषा तिमाही रिपोर्ट भरने संबंधी जानकारी प्रदान की तथा प्रतिभागियों को इस प्रोफार्मा को भरते समय किन मुद्दों को ध्यान में रखना है व इसे आसानी से कैसे भरा जा सकता है, इन सभी जानकारियों से अवगत कराया।

4. दिनांक 05 दिसंबर 2024 को संस्थान के नवनियुक्त कर्मचारियों हेतु "कार्यालयीन कार्य हिंदी में कैसे करें" विषय पर एक कार्यशाला का आयोजन किया गया । इसमें श्री जगदीशन ए.के., संयुक्त निदेशक (राजभाषा) ने कार्यालय में हिंदी में कार्य करना क्यों आवश्यक है? कर्मचारियों को कार्यालयीन कार्य हिंदी में कैसे करना है?, ई ऑफिस में हिंदी में कार्य कैसे करना है?, वॉइस टाईपिंग टूल का इस्तेमाल करते हुए हिंदी में कार्य कैसे करें? आदि कई पहलुओं पर व्याख्यान दिया तथा इसी के साथ प्रतिभागियों को प्रायोगिक एवं व्यवहारिक प्रशिक्षण भी दिया गया।

III) हिंदी सप्ताह/हिंदी पखवाड़ा/हिंदी चेतना मास

भा.कृ.अनु.प.- केंद्रीय मात्स्यिकी शिक्षा संस्थान के मुंबई स्थित मुख्यालय में दिनांक 02-30 सितंबर 2024 के दौरान हिंदी चेतना मास मनाया गया तथा इसके क्षेत्रीय केंद्रों में 14-21 सितंबर 2024 के दौरान हिंदी सप्ताह मनाया गया, जिसका विवरण निम्नलिखित है:

1) भा.कृ.अनु.प.- केंद्रीय मात्स्यिकी शिक्षा संस्थान, मुख्यालय

भा.कृ.अनु.प.-केंद्रीय मात्स्यिकी शिक्षा संस्थान, मुंबई में दिनांक 02 सितंबर 2024 को हिंदी चेतना मास का शुभारंभ मुंबई विश्वविद्यालय के हिंदी विभाग के अध्यक्ष प्रोफेसर करुणाशंकर उपाध्याय ने दीप प्रज्ज्वलित कर किया गया। कार्यक्रम की अध्यक्षता संस्थान के निदेशक व कुलपति डॉ. रविशंकर सी.एन. ने की। कार्यक्रम में संस्थान के संयुक्त निदेशक डॉ. एन.पी. साहू सहित सभी अधिकारियों व कर्मचारियों ने भाग लिया। इस अवसर पर संस्थान द्वारा प्रकाशित राजभाषा पत्रिका 'जलचरी' के 30वें अंक का विमोचन भी किया गया।

हिंदी चेतना मास के दौरान संस्थान के कर्मचारियों, छात्रों, कर्मचारियों के बच्चों के लिए विभिन्न प्रतियोगिताओं का आयोजन किया गया, जैसे –

- दिनांक 04 सितंबर 2024 को करम्चारियों और छात्रों के लिए निबंध प्रतियोगिता आयोजित की गई, कर्मचारियों के लिए 'एक राष्ट्र एक चुनाव', 'शून्य कार्बन उत्सर्जन', 'प्लास्टिक प्रतिबंध: पर्यावरण बनाम अर्थव्यवस्था', 'सामाजिक माध्यम: उपयोग और दुरुपयोग' आदि विषय दिए गए थे तो छात्रों के लिए 'प्लास्टिक प्रदूषण पर्यावरण के लिए खतरा', 'आर्टिफिशियल इंटेलिजेंस के फायदे और नुकसान, 'स्कूलों में कृषि शिक्षा का महत्व', सामाजिक माध्यम: उपयोग और दुरुपयोग' आदि विषय दिए गए थे।
- दिनांक 09 सितंबर 2024 को संस्थान के हिंदीतर भाषी छात्रों के लिए शब्द ज्ञान प्रतियोगिता आयोजित की गई।
- दिनांक 10 सितंबर 2024 को संस्थान के कर्मचारियों एवं छात्रों के लिए आशुभाषण प्रतियोगिता आयोजित की गई।
- दिनांक 12 सितंबर 2024 को संस्थान के कर्मचारियों के बच्चों के लिए चित्रकला प्रतियोगिता आयोजित की गई।
- दिनांक 13 सितंबर 2024 को संस्थान के कर्मचारियों एवं छात्रों के लिए प्रश्नोत्तरी प्रतियोगिता आयोजित की गई।
- दिनांक 18 सितंबर 2024 को दो प्रतियोगिताएँ आयोजित की गईं, जैसे संस्थान के कर्मचारियों के लिए टिप्पण एवं आलेखन प्रतियोगिता तथा कर्मचारियों व छात्रों के लिए हिंदी कविता पाठ प्रतियोगिता आयोजित की गई।
- दिनांक 19 सितंबर 2024 को संस्थान के कर्मचारियों के लिए हिंदी टंकण प्रतियोगिता आयोजित की गई।
- दिनांक 20 सितंबर 2024 को संस्थान के कर्मचारियों एवं छात्रों के लिए हिंदी विविधा प्रतियोगिता आयोजित की गई।
- दिनांक 23 सितंबर 2024 को संस्थान के छात्रों के लिए हिंदी वीडियो फिल्म प्रतियोगिता आयोजित की गई।
- दिनांक 25 सितंबर 2024 को "तिमाही प्रगति रिपोर्ट कैसे भरें?" विषय विभिन्न विभागों के कर्मचारियों के लिए एक कार्यशाला आयोजित की गई, जिसमें श्री ए.के. जगदीशन, संयुक्त निदेशक (राजभाषा) ने प्रतिभागियों को तिमाही रिपोर्ट भरने की विधियों पर विस्तार से समझाया।

हिंदी चेतना मास का समापन एवं पुरस्कार वितरण समारोह दिनांक 30 सितंबर 2024 को आयोजित किया गया, जिसमें प्रसिद्ध साहित्यकार एवं पत्रकार श्री विश्वनाथ सचदेव जी मुख्य अतिथि थे। कार्यक्रम की अध्यक्षता संस्थान के निदेशक व कुलपति डॉ. रविशंकर सी.एन. ने की। समापन समारोह में संस्थान के संयुक्त निदेशक सहित सभी अधिकारियों व कर्मचारियों ने भाग लिया। इस अवसर पर संस्थान द्वारा प्रकाशित द्विभाषी समाचार पुस्तिका 'मत्स्य दर्पण' का विमोचन भी किया गया।

2) कोलकत्ता केंद्र में हिंदी सप्ताह का आयोजन

भा.कृ.अनु.प. - केन्द्रीय मात्स्यिकी शिक्षा संस्थान के कोलकाता केन्द्र में दिनांक 17 से 23 सितंबर 2024 तक हिन्दी सप्ताह का आयोजन किया गया। दिनांक 17 सितंबर 2024 को प्रात: 11.30 बजे प्रमुख डॉ तापस कुमार घोषाल महोदय द्वारा दीप प्रज्जलित कर कार्यक्रम का उदघाटन किया गया। इसके बाद राजभाषा शपथ लिया गया। हिंदी अधिकारी डॉ. दिलीप कुमार सिंह के द्वारा धन्यवाद ज्ञापन के साथ उदघाटन कार्यक्रम सम्पन्न किया गया। दिनांक 18 से 23 सितंबर 2024, 3.00 से 5.30 बजे तक विभिन्न प्रतियोगिता जैसे भाषण, गीत, काव्य पाठ, हांस्य-व्यंग, चुटकुले, पत्र लेखन, निबंध लेखन, साइंस क्लब व्याख्यान, चित्रकला, वाद-विवाद एवं अंताक्षरी प्रतियोगता का आयोजन किया गया। इस दौरान प्रतियोगिता में सभी अधिकारियों, कर्मचारियों एवं छात्र-छात्राओं ने उत्साहपूर्वक भाग लिया। दिनांक 24 सितंबर 2024 को 2.30 बजे से समापन सत्र का आयोजन किया गया। समापन में प्रमुख महोदय के द्वारा सभी प्रतिभागियो को प्रमाणपत्र प्रदान किया गया।

3) पवारखेडा केंद्र में हिंदी सप्ताह का आयोजन

भा.कृ.अनु.प. परि.- केन्द्रीय मात्स्याकी शिक्षा संस्थान, पवारखेड़ा केन्द्र में प्रतिवर्षानुसार इस वर्ष भी हिन्दी सप्ताह का आयोजन दिनांक 14-20 सितम्बर 2024 के दौरान किया गया । इस दौरान वर्ष 2023-24 की प्रगति रिपोर्ट प्रस्तुत की गई तथा हिन्दी के कार्यों को बढाने हेतु सभी के सुझाव भी लिए गए । साथ ही साथ प्रतिदिन कार्यालय के विभिन्न श्रेणी के कर्मचारियों कनिष्ठ वर्ग हेतु मत्स्य सामान्य ज्ञान प्रतियोगिता, पत्र लेखन, वरिष्ठ वर्ग हेतु शुध्दलेखन प्रतियोगिता एवं कार्यालयीन शब्दों के शब्दार्थ, निबंध प्रतियोगिता व कुछ संयुक्त प्रतियोगिताएं जैसे कि अंताक्षरी व गायन प्रतियोगिता का आयोजन किया गया था । इस वर्ष प्रभारी अधिकारी के मार्गदर्शन में प्रतियोगिताओं का संचालन एवं निर्णायक की भूमिका श्री हसन जावेद, सचिव, हिन्दी राजभाषा समिति द्वारा की गई तथा उपरोक्त सभी प्रतियोगिताओं में विजेताओं को प्रथम, द्वितीय व तृतीय पुरस्कार भी प्रोत्साहन स्वरूप दिए गए । इन पुरस्कारों के साथ में वर्ष 2023 -24 में कार्यालय में हिन्दी में उत्कृष्ट कार्य हेतु श्री दीपक कुमार कुशवाह, एमटीएस को पुरस्कृत किया गया ।

4) रोहतक केंद्र में हिंदी सप्ताह का आयोजन

भा.कृ.अनु.प.-केन्द्रीय मात्स्यिकी शिक्षा संस्थान, मुंबई के रोहतक केन्द्र में दिनांक 14-20 तक हिन्दी सप्ताह मनाया गया । इस अवसर पर इस संस्थान के समस्त अधिकारियों / कर्मचारियों ने हिन्दी में अधिक से अधिक वार्तालाप किए। मिसिलों में हिन्दी में टिप्पणियाँ लिखी गईं । दिनांक 20.09.2024 को हिन्दी सप्ताह का समापन समारोह का आयोजन किया गया सभी अधिकारियों ने हिन्दी की महत्व को बताया और अधिक से अधिक कार्य हिन्दी में करने के लिए प्रेरित किया । समापन समारोह के अवसर पर एक चित्रकला का आयोजन भी किया गया जिसमें निम्नलिखित अधिकारियों / कर्मचारियों ने भाग लिया तथा प्रथम द्वितीय एवं तृतीय प्रतिभागियों को प्रभारी अधिकारी एवं अध्यक्ष द्वारा पुरस्कार का वितरण किया गया साथ-साथ अन्य सभी अधिकारियों / कर्मचारियों को भी सांत्वना पुरस्कार देकर सम्मानित किया गया ।

5) काकीनाडा केंद्र में हिंदी सप्ताह का आयोजन

भाकृअनुप-केंद्रीय मात्स्यिकी शिक्षा संस्थान केकाकीनाडा केंद्र में 14 से 20 सितंबर 2024 तक हिंदी सप्ताह का आयोजन किया गया। इस सप्ताह के दौरान काकीनाडा केंद्र के बीडब्ल्यूएफएफ और एफडब्ल्यूएफएफ विभागों में विभिन्न प्रतियोगिताओं का आयोजन किया गया। उद्घाटन के दिन यानी 14 सितंबर 2024 को काकीनाडा केंद्र में सभी स्टाफ सदस्यों द्वारा राजभाषा शपथ ली गई। उद्घाटन के दौरान प्रभारी अधिकारी डॉ. मुरलीधर पी. अंदे ने हिंदी सप्ताह और हिंदी के कार्यान्वयन के महत्व पर अपने विचार प्रस्तुत किए। । हिंदी हस्तलेखन, चित्रकला प्रतियोगिता, गीत और कविता पाठ जैसी विभिन्न प्रतियोगिताएं सभी स्टाफ सदस्यों के लिए आयोजित की गईं। हिंदी सप्ताह का समापन दिनांक 20. 09. 2024 को किया गया। प्रतियोगिताओं के सभी विजेताओं को पुरस्कार वितरित किए गए। कार्यक्रम का समापन औपचारिक धन्यवाद ज्ञापन के साथ किया गया, जिसमें काकीनाडा केंद्र के सभी सदस्यों ने सक्रिय रूप से भाग लिया।

IV) विश्व हिंदी दिवस का आयोजन

संस्थान में दिनांक 10 जनवरी 2024 को विश्व हिंदी दिवस मनाया गया। इस दौरान संस्थान और इसके क्षेत्रीय केंद्रों के कर्मचारियों एवं छात्रों के लिए एक निबंध प्रतियोगिता आयोजित की गई। इस प्रतियोगिता के लिए दो विषय दिए गए थे, जैसे कर्मचारियों के लिए विकसित भारत अभियान में हिंदी की भूमिका और छात्रों के लिए वैश्विक परिदृश्य में हिंदी की भूमिका विषय दिए गए थे।

V). राजभाषा निरीक्षण

राजभाषा विभाग द्वारा जारी वार्षिक कार्यक्रम में निर्धारित लक्ष्यों की पूर्ति के लिए संस्थान के मुख्यालय में स्थित समस्त विभागों और अनुभागों में राजभाषा प्रगति का जायजा लेने के लिए दिनांक 20 एवं 21 फरवरी, 2024 को संस्थान के हिंदी विभाग के अधिकारियों के द्वारा निरीक्षण किया गया और निरीक्षण के दौरान पाई गई कमियों को दूर करने के सुझाव भी दिए गए। विवरण निम्नलिखित है:

- दिनांक 20 फरवरी 2024 को प्रशासन अनुभाग, वित्त एवं लेखा अनुभाग, कार्य अनुभाग, जलकृषि विभाग का नीरीक्षण किया गया।
- दिनांक 21 फरवरी 2024 को मत्स्य पोषण, जैव रसायन एवं कार्यिकी विभाग, मात्स्यिकी संसाधन एवं प्रग्रहणोपरांत विभाग, मत्स्य आनुवंशिकी एवं जैव प्रौद्योगिकी विभाग, जलीय जीव स्वास्थ्य प्रबंधन विभाग, मत्स्य विस्तार, सांख्यिकी एवं अर्थशास्त्र विभाग, शैक्षणिक अनुभाग, परीक्षा अनुभाग और पुस्तकालय अनुभाग का निरीक्षण किया गया।

VI) प्रोत्साहन योजना

क) राजभाषा चल वैजयंती

संस्थान में राजभाषा हिंदी की उत्तरोत्तर प्रगति हेतु हिंदी में कामकाज को बढ़ावा देने के लिए इस वर्ष से राजभाषा चल वैजयंती योजना प्रारंभ की गई। इस वर्ष यह पुरस्कार राजभाषा के क्षेत्र में उत्कृष्ट कार्य के लिए संस्थान के वित्त एवं लेखा अनुभाग को प्रदान किया गया। यह पुरस्कार हिंदी चेतना मास के समापन एवं पुरस्कार वितरण समारोह के दौरान प्रदान किया गया।

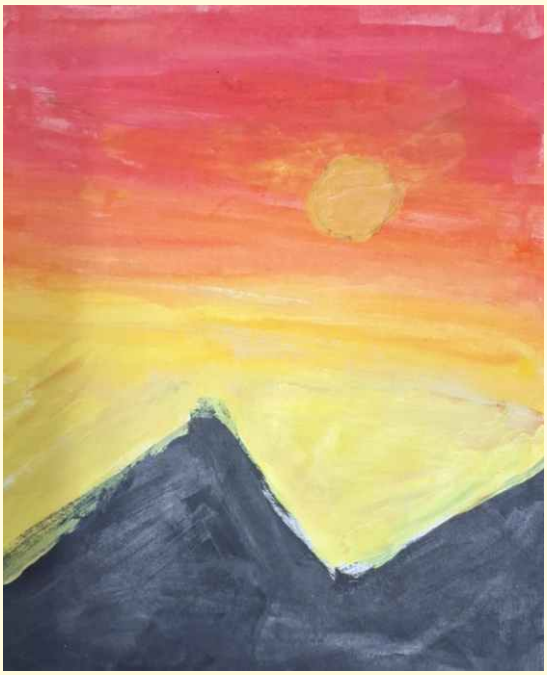
ख) मूल रूप से हिंदी में कार्य करने के लिए लागू की गई प्रोत्साहन योजना

संस्थान में राजभाषा हिंदी में मूल रूप से कार्य करने को बढ़ावा देने के लिए प्रोत्साहन योजना लागू की गई है। संस्थान के कई कर्मचारी इस योजना में भाग ले रहे हैं। इस योजना के तहत नगद पुरस्कार एवं प्रमाण-पत्र प्रदान किया गया:

VII) हिंदी जलवाणी पाठ्यक्रम

इस संस्थान में देश-विदेश से आए छात्र-छात्राओं के लिए मात्स्यिकी विषय से संबंधित उच्च शिक्षा प्रदान की जाती है । इन छात्र-छात्राओं को हिन्दी का ज्ञान बढ़ाने हेतु इस संस्थान के एम.एफ.एसएसी. के प्रथम वर्ष के छात्र-छात्राओं के लिए वर्ष 2003 से नियमित रूप से हिन्दी जलवाणी नामक पाठयक्रम संचालित किया जा रहा है। पाठयक्रम की रचना इस प्रकार से की गई है कि हिन्दी का कार्यसाधक ज्ञान रखनेवाले और नहीं रखनेवाले छात्र-छात्रा अलग-अलग समूहों में इसका अध्ययन कर सकें। इसी क्रम में, सत्र 2022-24 का हिन्दी जलवाणी पाठयक्रम संचालित किया गया, जिसमें कुल 97 छात्रों का नामांकन किया गया ।

हिंदी चेतना मास के दौरान संस्थान के कर्मचारियों के बच्चों के आयोजित चित्रकला प्रतियोगिता में पुरस्कार प्राप्त चित्र



Recruitment Fair: Unlocking Opportunities in the Thriving Aquaculture Sector

The ICAR Central Institute of Fisheries Education (CIFE), Mumbai, successfully organized the "Recruitment Fair: Unlocking Opportunities in the Thriving Aquaculture Sector" on December 18, 2024. This pioneering event served as a significant step towards bridging the gap between academia and industry, offering fisheries graduates an invaluable platform to explore job opportunities while enabling recruiters to connect with emerging talent. The program was inaugurated by Dr. Joykrushna Jena, Deputy Director General of Fisheries, ICAR, in the presence of Dr. Ravishankar C.N., Director & Vice-Chancellor, and Dr. N. P. Sahu, Joint Director of ICAR CIFE, Mumbai. Dr. K.N. Mohanta, Head of Fish Nutrition, Biochemistry, and Physiology (FNBP), ICAR CIFE, and Convener of the event, extended a warm welcome to all delegates and participants and provided an overview of the program. In his inaugural address, Dr. Jena highlighted the critical role of collaboration among researchers, industries, and students in advancing the fisheries sector's research and development. He applauded ICAR CIFE, Mumbai, for initiating this meaningful event, describing it as a vital bridge connecting industries and students.

The fair saw participation from 37 industries and 288 postgraduate and Ph.D. students specializing in various fisheries science disciplines from across the country. Interviews were conducted both online and offline, covering key thematic areas such as aquaculture, nutrition, processing and value addition, health and environment, genetics, and biotechnology.

'Sahaja Yoga' Meditation Session

ICAR-CIFE organized a "Sahaja Yoga" meditation session on January 13 2024 for students and staff. The session was conducted by a team of eight experienced practitioners from 'The Life Eternal Trust, Andheri (E), Mumbai, led by Adv. Ms. Suman Kotian. Over 25 participants, including students and staff of ICAR-CIFE, participated in the session. Dr. N. S. Nagpure, Chief Warden, welcomed the guests and participants and explained the importance of regular yoga practice and meditation for mental and physical well-being. Adv. Ms. Kotian enlightened the enthusiastic audience on the practice and importance of Sahaja Yoga Meditation for leading a stress-free life and gaining happiness and self-realization. A Sahaja Yoga session by Mr. Ramesh Wanage and other team members followed this. A short mediation session was also conducted by combining music for stress relief and for experiencing a blissful state of thought and awareness, during which Mr. Sunay Kumar elucidated on balancing the Nadis in our body to prevent psycho-somatic diseases and for gaining inner beauty and power strength. Dr. Ravishankar C.N., Director and Vice-Chancellor, ICAR-CIFE, also graced the session and appreciated the efforts of the Sahaj Yoga experts and the organizing committee. Dr. Paramita B. Sawant, Warden, Girls Hostel, gave the vote of thanks.

75th Republic Day Celebration

Patriotism, joy, and the determination to work hard in unity defined the celebration of the 75th Republic Day of India at the ICAR-CIFE, Mumbai. The Director & Vice-Chancellor of ICAR-CIFE, Dr. C.N. Ravishankar hoisted the tricolor and addressed the gathering. While remembering with gratitude the dedication and sacrifice of all those who made India a sovereign republic, Dr. Ravishankar highlighted the advances India has made in agriculture, space research, education, health, and infrastructure in the last seven decades and emphasized the need to work further hard to make India progressive, self-sufficient and a global leader. He pointed out that ICAR-CIFE has been instrumental in shaping fisheries education in India, human resource development in fisheries, technology development, and dissemination. Joint Director Dr. N.P. Sahu, heads of divisions, chief administrative officer, scientists, staff, and the students attended the function. This was followed by cultural programs by the staff and students of ICAR-CIFE.

One-day workshop on "Significance of branding and IP for micro and small entrepreneurs"

ICAR – Central Institute of Fisheries Education, Mumbai, conducted an awareness and sensitization program titled "Significance of Branding and IP for Micro and Small Entrepreneurs" on January 30, 2024. Supported by the National Agricultural Innovation Fund (NAIF) – Institute Technology Management Unit (ITMU), the event aimed to educate participants on the crucial role of branding and IP in business. The session commenced with an illuminating presentation by Mr. Vikas Motiram Koli, the Founder of

Kolibaba Pvt Ltd., Versova. Drawing from his extensive 20 years of expertise in branding and marketing, Mr. Koli shared invaluable insights, including his personal journey as the founder of Kolibaba Pvt Ltd. He also lauded ICAR – CIFE for its proactive stance in orchestrating such insightful initiatives.

Further enriching the discourse, Ms. Ajita Ghag, representing the AFDO, Nashik Region, elucidated on "Introduction to PMSSY Schemes and other schemes offered by the state government." Mr. Naimesh Tungare, a Certified Trainer for food processing from the Ministry of Food Processing, delved into the realm of "Value-added fish products, packaging, Marketing, and the importance of IP for micro-entrepreneurs."

The program benefited a total of 38 participants, including micro-entrepreneurs, fishermen, women from SCGs, and students, fostering a diverse and inclusive learning environment.

Field day on "Fish-Based Integrated Farming System"

The field day on "Integrated Pig Cum Fish Farming,"; "Integrated Duck Cum Fish Farming," and "Integrated Poultry Cum Fish Farming" were conducted from 20 to February 23, 2024, under NEH program at Gandacherra, Dhalai District, by ICAR- CIFE, Mumbai in collaboration with Dept. of Fisheries, Tripura. A total of 90 farmers were participated in the events and informed about the integrated farming system model developed by ICAR-CIFE, Mumbai. There was an interaction among the farm owners, Scientists, department officials, and farmers about the farming management practices, particularly health management aspects. The program was coordinated by Dr. Arun Sharma, Dr. T.I. Chanu, Mr. Dhalongsaih Reang, Mr. Ratnadeep Saha, Mr. Madan Tripura.

IP Awareness Programme on "Intersection of Trading and Intellectual Property (IP)"

A sensitization program titled "Intersection of Trading and Intellectual Property (IP)" was conducted on February 05, 2024. Supported by the National Agricultural Innovation Fund (NAIF) – Institute Technology Management Unit (ITMU), the event was designed to enlighten participants about the pivotal role of IP in technology commercialization. The guest speaker, Dr. Gopakumar Nair, Founder of GNA, gave an insightful presentation on the occasion.

National Science Day 2024

Institute Technology Management Unit (ITMU) of ICAR-CIFE, Mumbai, organized an exhibition of the models and posters of the innovative ideas of the students on the occasion of National Science Day on February 25, 2024. The focal theme of the exhibition revolved around "Artificial Intelligence (AI) in Fisheries and Prospects for the Future". More than 40 students participated in 15 groups and displayed their models and posters. The event received an overwhelming response, with a significant turnout of over 180 students, Scientists, and technical staff. Dr. S.P. Shukla, Officer in Charge (ITMU), Dr. Manjusha L, Dr. Kapil Sukhdhane, Dr. Neha Qureshi, and Dr. Arun Kumar Sharma (Members, ITMU), coordinated the event. Dr. Gauri Harulkar, Research Associate (ITMU), and students coordinated the program. All the models/posters were evaluated by a panel of judges for the prizes.

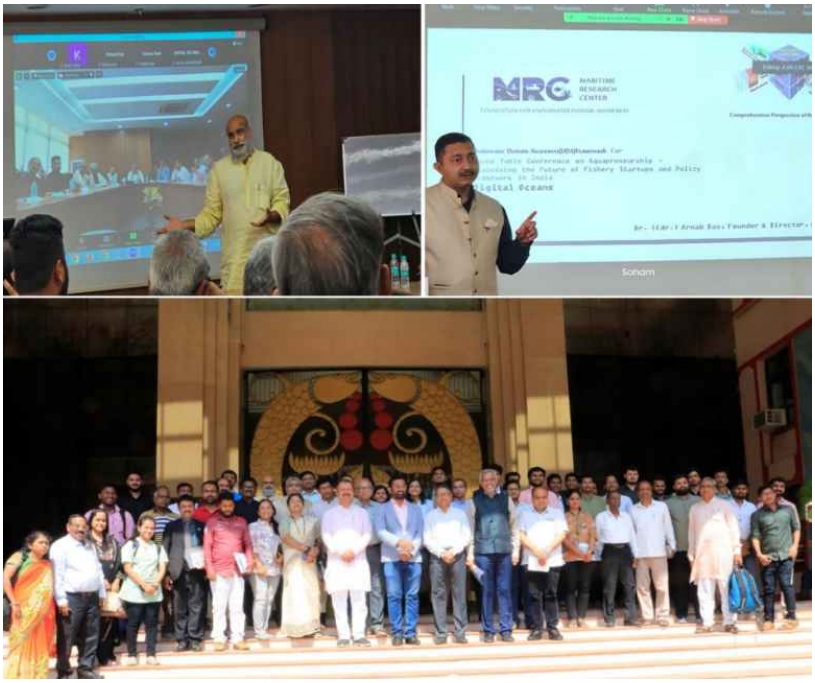
ICAR-CIFE Agribusiness Incubation Centre Organizes COHORT-One

Agribusiness Incubation Centre of ICAR-CIFE, Mumbai, with the support of IP&TM Unit, ICAR organized a two-day aquapreneurship development program, "COHORT-One" on 30-31 May 2024, in collaboration with Bhoomiputra Foundation, an NGO working for the welfare of Koli (Fisher) Community in Maharashtra and National Agricultural Higher Education Project (NAHEP). The program was attended by 166 participants from Maharashtra, Gujarat and Odisha. There were four technical sessions where the ABI incubatees, start-ups, entrepreneurs, industry and finance personnel, researchers, and academicians from NABARD, MPEDA, MSME, ICAR Institutes, Fisheries Department, Agriculture Department, and Fish & Shrimp Industries freely exchanged ideas and information about the critical issues in strengthening the agribusiness and start-ups and entrepreneurial initiatives of incubatees. As an output of the interaction on the first day, five Cohort Groups, i.e., Seaweed culture, Fish value addition, Ornamental fish culture and fish seed production, Aqua feed development, and Spirulina culture, were formed for further round table discussion on specific issues related to the theme areas of the cohort groups. The program was inaugurated by Padma Bhushan Shri Ram Naik (Former Governor of Uttar Pradesh), President of the Fisheries Development Policy Committee, Maharashtra.

Capacity Development Programme on Communication Skills for Youth of North Eastern and Hilly (NEH) Regions of India

The Personality Development and Career Counselling Unit (PDCCU), Placement and Entrepreneurship Cell of ICAR-CIFE, Mumbai, organized a transformative capacity development program aimed at enhancing the communication skills of the youth of NEH regions from 11-13 March 2024. The program benefited from the expertise of Verbal-Non-Verbal-Audio (V-N-A) trainer Shri. Dinanath Chowrasia. His collective insights enriched the program, offering diverse perspectives and strategies for effective communication.

Round Table Conference on “Aquapreneurship: Discussing the Future of Fishery: Start-ups and Policy Framework in India."



The Agribusiness Incubation Centre (ABIC) of ICAR- Central Institute of Fisheries Education and the Savishkar India, an NGO under the Ministry of Agriculture and Farmers Welfare, India and Anantam Ecosystems organized a round table conference on the topic “Aquapreneurship: Discussing the future of fishery start-ups and policy framework in India." on March 18, 2024. 54 participants were present at the conference, representing start-ups in aquaculture and fisheries, policymakers, fishermen organizations, academicians, PhD students, and a few undergraduates. Dr. Ravishankar, Director and Vice-Chancellor of ICAR-CIFE, highlighted the importance of infrastructural development in harnessing the potential of fisheries and aquaculture in pharmaceutical, healthcare, biotechnology, and allied areas. Mr. Chintan Oza, founder of Anantam Ecosystems and India Region Lead for IEEE Entrepreneurship, Shri. Atul Patane, IAS, Secretary-in-Charge and Commissioner of Fisheries, Maharashtra; Mr. Debtanu Barman, CEO and Founder of Aqua Doctor Solutions; Mr. Jaideep Patil, National President of FISHFED India, Shri. Praful Talera, West Region Committee-Confederation of Indian Industry Expert in Blue Economy, Dr(Cdr)Arnab Das, Founder & Director Maritime Research Center (MRC), Shri. Ashish Chauhan, a Policy Expert, spoke on the occasion. An open session followed the invited talks where the experts and the participants, including the students, shared their thoughts and ideas. Dr. Kranti Sagar More, National Convener, Savishkar India, proposed the vote of thanks.

Training on ISO/IEC 17025: 2017& Internal Auditing

A training program titled "ISO/IEC 17025: 2017 & Internal Auditing" was held at ICAR-Central Institute of Fisheries Education, Mumbai, from March 26 to 28, 2024. Mr. S. Subramanian, Lead Assessor for the ISO/IEC 17025: 2017 standard, served as the primary resource person, while Dr. A. Pavan Kumar coordinated the program activities. Twenty scientists from various divisions of ICAR-CIFE participated in the program. During his inaugural address, Dr. Ravishankar, Director & Vice-Chancellor of CIFE, emphasized the significance of lab accreditation for producing valid results and gaining global recognition. He highlighted that the ISO/IEC 17025: 2017 standard outlines the requirements for labs to demonstrate competence in performing tests and generating valid results.

World Intellectual Property Day

ICAR – Central Institute of Fisheries Education, Mumbai, organized a sensitization program on World Intellectual Property Day 26 April 2024, supported by the National Agricultural Innovation Fund (NAIF) – Institute Technology Management Unit (ITMU). The aim of the program was to educate and motivate the participants about the crucial role of intellectual property (IP) in research and its subsequent commercialization. Dr. Manjusha L, Senior Scientist & ITMU Member, warmly welcomed all attendees and introduced the guest speakers, Dr. Gopakumar Nair, Founder of GNA's, and Shri. Manoj Somkuwar, Assistant Controller of Patents and Designs, Patent Office, Govt. of India. Dr. Nair delivered an insightful presentation drawing from his over 40 years of experience in patent filing and IP management, focusing on this year's World Intellectual Property Day theme, "IP and the SDGs: Building our common future with innovation and creativity." More than 50 participants attended the program. Manoj Somkuwar provided an introduction to patent and design filing procedures and acquainted the audience with recent modifications in the Indian patent laws. Dr. S.P. Shukla, Officer-in-charge of ITMU presented the vote of thanks.

NAHEP Sponsored Kids Museum Fest organised on International Museum Day at ICAR – CIFE, Mumbai

On the occasion of International Museum Day, FRHPHM Division of ICAR CIFE, with the financial support and guidance of ICAR-NAHEP, organized a vibrant Kids Museum Fest at the Aquatic Biodiversity Museum of ICAR CIFE on May 18, 2024. The event aimed to engage children and their parents in interactive learning experiences centered around marine conservation and biodiversity. The fest welcomed 37 enthusiastic children and their parents, eager to explore the wonders of the aquatic world. The day commenced with a guided tour of the museum's main exhibits, featuring interactive displays and hands-on activities. Young visitors were introduced to various marine species, fishing techniques, and conservation efforts, sparking their curiosity and prompting insightful questions. Dr. Nayak B.B, HoD FRHPHM, delivered a thought-provoking talk on the importance of aquatic biodiversity and the need to educate today's kids about climate change. The event concluded with a closing ceremony presided over by ICAR-CIFE NAHEP's PI, Dr. N P Sahu.

World Food Safety Day National Webinar and Educational Exhibition

World Food Safety Day was organized on June 07, 2024, by the Post-Harvest Technology section of FRHPHM Division at ICAR-CIFE, Mumbai. The National Agricultural Higher Education Project (NAHEP) sponsored the program. This year's theme for World Food Safety Day, declared by FAO, is "Food Safety: Prepare for the Unexpected". The events included a hybrid mode National Webinar on "Pertinent Issues in Food Safety & Hygiene" by Dr. Indrani Karunasagar, Director-Projects & DST-TEC, Nitte University, Mangalore and an educational exhibition cum demo on food safety issues, detection of adulterants and contaminants in foods and safe food practices. In the webinar, Dr. Indrani Karunasagar emphasized the significance of food safety, including seafood, common contaminants present in foods, and ways to avoid such contamination. Over 150 registered participants attended the webinar. This was followed by the educational exhibition, which was inaugurated by the Director & Vice-Chancellor, Dr. C.N. Ravishankar, in the presence of Dr. N.P. Sahu, Joint Director. More than 250 visitors attended the exhibition cum demo, which included posters on common food-borne illnesses, outbreaks associated with food-borne diseases, unsafe foods to be avoided, chemical contaminants in foods, safety of food-processing methods and packaging materials, and good hygienic practices to be followed to prevent contamination and food-borne disease outbreaks. The demonstration of simple tests for detecting adulterants in everyday foods such as milk, ghee, honey, and artificially ripened fruits and the models that displayed unsafe street foods were arranged. The exhibition was attended by students, scientific, technical, administrative staff, and the public. Dr. B.B. Nayak, Head (FRHPHM Division), Dr. Sanath Kumar, Principal Scientist, and Dr. Manjusha L., Senior Scientist, organized and coordinated the Food Safety Day events at ICAR-CIFE.

ICAR-CIFE Celebrates Its 64th Foundation Day

ICAR-Central Institute of Fisheries Education, Mumbai, celebrated its 64th foundation day on June 14, 2024. Dr. Sanjay Kumar (Chairman of the Agricultural Scientists Recruitment Board, New Delhi) was the Chief Guest. Dr. Sanjay Kumar highlighted the importance of fisheries and aquaculture sectors in the Indian Economy. He appreciated ICAR-CIFE's efforts to create all-around quality human resources in fisheries and aquaculture. He urged to work for marginalized fisher and fish farmers to sustain their livelihood and improve their socio-economic conditions.

Dr. Ravishankar C. N. (Director & Vice-Chancellor) highlighted the success milestones of the institute since its inception in 1961. He congratulated and appreciated the efforts of all retired and existing leaders and staff of the institute for taking this institute to the center of excellence in higher education in fisheries and aquaculture.

On this occasion, institutional awards, sports awards, and endowment awards were given to staff and students in different categories of scientific, technical, and administrative for outstanding contributions. The extension and scientific publications were released on the occasion of foundation day. Dr. N. P. Sahu, Joint Director, proposed a formal vote of thanks.

ICAR-CIFE Celebrates India's 78th Independence Day

ICAR-Central Institute of Fisheries Education celebrated the 78th Independence Day on August 15, 2024, with great gaiety, enthusiasm, and full participation of CIFE pariwar members. It was celebrated in Mumbai and its five regional Centres at Kolkata, Kakinada, Powarkheda, Rohtak, and Motipur with integrity and commitment towards "Viksit Bharat" by 2047. Dr. Ravishankar C. N., Director & Vice-Chancellor of ICAR-CIFE, hoisted the National Flag and delivered the Independence Day address. At the outset, the Director offered tribute to the Nation's freedom fighters and remembered their sacrifice. He acknowledged the contribution of retired and existing officials and staff of ICAR-CIFE to taking this institute to greater heights.

Deans' Conference for Implementation of NEP 2020 in Fisheries Education and Promoting Student Entrepreneurship

Deans' conference for implementation of the New Education Policy (NEP) 2020 in fisheries education and promoting student entrepreneurship was held on August 06, 2024, at ICAR-CIFE, Mumbai, under the NAHEP-CAAST project. Dr. Ravishankar C. N., Director and Vice-Chancellor, CIFE, welcomed Dr. J. K. Jena, DDG (Fisheries), ICAR, and the Deans of 28 Fisheries Colleges who graced the occasion. CIFE faculty members also participated in the event. Discussions were held on the various aspects of NEP 2020, including multiple entry-exit, multi-disciplinary curriculum, increasing student enrollment, academic bank of credits, sandwich degree programs, skill development, etc. Several issues and concerns were resolved through discussions and clarifications from the DDG (Fisheries) and Dr. N. P. Sahu, Joint Director, CIFE, Mumbai and PI, NAHEP-CAAST project. DDG Fisheries also noted the specific concerns of colleges /universities related to ICAR. Dr. Aparna Chaudhari, Dean (Academics), and Dr. Rupam Sharma (Nodal Officer, NAHEP-CAAST) coordinated the organization of this event.

International Students' Conference on Globalization of Fisheries Education: Challenges and Opportunities- 2024

The International Students' Conference on Globalization of Fisheries Education: Challenges and Opportunities was held virtually on November 21-22, 2024. Organized by ICAR-Central Institute of Fisheries Education, Mumbai, this event was a significant initiative aimed at promoting movement of fisheries and aquatic science students across the globe for their higher studies along with students-to students' cooperation. A total of 1,087 registrations were recorded, and 650 students and research scholars actively engaged in both the conference days. Participants represented from 22 countries, including Germany, France, USA, UK, Czech Republic, and others. This diversity highlighted the global significance of the event. The program was coordinated and conducted by the students and facilitated by the faculty members. The conference explored crucial themes relevant to higher education in fisheries, such as: Cost of Education including sponsorship and fellowship avenues, liberty and flexibility in education systems, focusing on inter-disciplinary movement and part-time work opportunities, ethics and values, emphasizing social equity, cultural integration, safety and environmental safeguards. The event featured 20 esteemed panel speakers, many of them were ICAR-CIFE alumni now pursuing higher education abroad. The Convenor was Dr. B. B. Nayak along with Dr. A. K. Verma (Organizing Secretary), Co-organising secretaries are Dr Vinod K Yadav, Dr Monalisha Devi, Dr. Sikendar Kumar Dr. Kiral Rasal, Mrs. Bharathi Rathinam and Mr. Abuthagir Iburahim.

National Seminar on “Seafood Safety & Public Health”

The National Seminar on “Seafood Safety & Public Health” sponsored by DST-SERB was organised at the Post-Harvest Technology section of FRHPHM Division, ICAR-CIFE, Mumbai during 04-05 January 2024. This seminar emphasized on addressing the seafood safety concerns including seafood-borne pathogens of human health significance, antimicrobial resistance, climate change, and their impact on public health and the future strategies to mitigate this problem such as the One-Health approach. The seminar was inaugurated by Dr. Iddya Karunasagar, Former Senior Fisheries Officer, FAO with his inaugural lecture on “Seafood Safety and International Trade: A Regulatory Perspective”. This was followed by lectures given by eminent speakers including Dr. Jyoti Prakash Tamang, Senior Professor, Dept. of Microbiology, Sikkim University; Dr. S. B. Barbuddhe, Director, ICAR-NMRI, Hyderabad; Dr. Rajesh Bhatia, Former Advsior, FAO; Dr. G. Jeyasekharan, NPC, New Delhi; Dr. Archana Rath, AMR Laboratory, Mumbai University and Dr. C. N. Ravishankar, Director & Vice-Chancellor, ICAR-CIFE, Mumbai. The lecture topics encompassed diverse aspects of food safety issues such as metataxonomic and food safety features of traditional, fermented foods; significance of Listeria monocytogenes in fish and meat products; seafood safety from environmental dimensions and One-Health Perspective; seafood authentication and food safety challenges associated with novel fish processing technologies. The seminar was attended by more than 60 participants including students and faculty from ICAR-CIFE, Mumbai and other institutes such as KUFOS, Kerala; ITCFSAN, FSSAI, Mumbai.

Workshop on "Harnessing Modern Tools for Smarter Documentation"

ICAR-Central Institute of Fisheries Education, Mumbai, in collaboration with ICAR-Directorate of Knowledge Management in Agriculture, New Delhi, organized a One-Day Workshop on "Harnessing Modern Tools for Smarter Documentation" on 23rd September 2024 at ICAR-CIFE, Mumbai for the faculty and students of ICAR-CIFE. A total of 110 participants attended the workshop. The workshop was inaugurated by Dr. R. C. Agrawal, DDG (Edn.) with Dr. Anuradha Agrawal, Project Director, DKMA, ICAR, Delhi as the Guest of Honour. Dr. C. N. Ravishankar, Director & Vice-Chancellor, ICAR-CIFE, Mumbai welcomed Dr. R. C. Agarwal, DDG (Edn.) and Dr. N. P. Sahu, Joint Director, ICAR-CIFE, Mumbai gave an overview of the programme. overview. Dr. Gayatri Tripathi presented the vote of thanks. The technical sessions were conducted Mrs Chhavi Agrawal, a Management Consultant from the World Bank, Mr Bhavesh Shah, Senior Territory Manager at Informatics Publishing Ltd., Bangalore, and Mr Kiran, Technical Associate at Graffiti LLC, Bangalore.

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