



ICAR-CIFE वार्षिक प्रतिवेदन
ANNUAL REPORT
2018-19





ICAR-CIFE - वार्षिक प्रतिवेदन Annual Report 2018-19



भा.कृ.अनु.प.-केन्द्रीय मात्स्यिकी शिक्षा संस्थान
मुंबई-भारत

ICAR-Central Institute of Fisheries Education
Mumbai-India





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Cover page Concept:
Artificial Intelligence to achieve Blue Revolution

Contents



1. Preface	1 r
2. Executive Summary	5 r
3. Introduction	11 r
4. Academic Achievements	17 r
5. Research Achievements	45 r
6. Extension Achievements	83 r
7. Honours and Awards	105 r
8. Linkages and Collaborations	111 r
9. Publications	115 r
10. Participation in Workshops/Conferences/ Symposia/Meetings/Farmers Meet	135 r
11. Meetings/Workshops/Seminars/Summer/ Winter Schools organised	149 r
12. Distinguished Visitors	163 r
13. Others	169 r
14. Personalia	177 r
15. Hindi Report	185 r





Preface



The importance of fisheries sector is evident from its vital role in national economic development and assurance of food and nutritional security. The education and research in fisheries is expected to further boost the development of sector and the societal upliftment. The ICAR-Central Institute of Fisheries Education (CIFE), a premiere institute in fisheries science occupying 7th rank amongst the agricultural universities in India, is striving hard in its endeavour to fulfil the needs of the fisheries sector with innovative research and training of human resources through its post-graduate programs. Established in 1961, the institute became a deemed-to-be university in 1989. The mission of the institute is to achieve excellence in research, generate competent human resources and contribute towards nutritional security of the country. The institute has highly trained and competent faculty at its headquarter at Mumbai and in its five regional centers located at Kakinada Andhra Pradesh, Powarkheda Madhya Pradesh, Rohtak Haryana, Kolkata West Bengal and Motipur Bihar. ICAR-CIFE offers post-graduate programs in 11 disciplines viz., Aquaculture, Genetics & Breeding, Biotechnology, Health Management, Environment Management, Resource Management, Post harvest Technology, Nutrition & Feed Technology, Biochemistry & Physiology, Economics and Extension.

Academics and research are given equal weightage in the institute which attracts students from different parts of the country to pursue higher education in fisheries at CIFE. During the current academic year (2018-19), 75 students were enrolled for masters (M.F.Sc.) and 67 for Ph.D. program. CIFE campus features the best residential facilities for students such as in-campus hostel, cafeteria, library, sports complex, dispensary and internet. Students enjoy free mobility across the laboratories which are well equipped with modern equipment. We also ensure overall development of students through personality development programs along with national and international exposures, which is supported by our National Agricultural Higher Education Project. The institute organized various mega events in 2018-19. The Third International Students Convention was attended by more than 300 students from 26 fisheries colleges, which provided a right platform for exchange of ideas and development of linkages amongst the students. A workshop was organized to revise and reform fisheries syllabus in the country involving experts from India and abroad. The goal of this workshop was to revise the syllabus and update the curriculum to make it relevant with the changing needs of the stake holders and bringing in the latest developments into the course curriculum. The quality education

and training conferred on students by CIFE is aptly reflected in their performances. In the past 5 years, students of CIFE secured more than 90% of the ARS positions in fisheries science. Several other students are placed as faculty in state fisheries colleges, state fisheries departments and private sectors as well.

A part from academic performances, CIFE has made significant research contributions this year through 12 institutional and 21 externally funded projects. Inland saline water aquaculture is the flagship program of ICAR-CIFE and the activities of the institute in this sector have benefitted a large number of farmers. The contribution of CIFE in training of farmers and in their livelihood generation have been appreciated by the Governments of Maharashtra, Haryana and Punjab. A multidisciplinary project on the Development of environmental protective aquaculture technologies for degraded soils' with special focus on inland saline water funded by National Agricultural Higher Education Project is in operation since March 2018.

Besides, Short Training Programs (STP) and Skill Development Programs (SDP) are regularly conducted at CIFE headquarters as well as at its centers for creating skilled workforce to meet the requirement of the fisheries industry. Other training and awareness programs conducted at ICAR-CIFE are under North East Hill (NEH) region and Tribal Sub Plan (TSP). Altogether, over 2700 participants have been trained under these programs.

We are constantly engaged in the process of upgrading the quality of fisheries education and research with the aim of producing competent graduates. Being a leader in

fisheries education, CIFE is in the forefront of changing educational scenario of the country. We are open to introduce new courses, integrated degree programs to complement the new UGC directives for recruitment of assistant professors with minimum qualification of Ph.D. The institute continues to collaborate with the overseas universities for better exposure of our students and faculty, as well as to strengthen our academic programs.

We sincerely acknowledge the support, guidance and continuous encouragement by Dr. Trilochan Mohapatra, Secretary, DARE & DG, ICAR in all our endeavours. We are grateful to Dr. J. K. Jena, DDG (Fisheries Science) for his encouragement and support in all our activities. Our heartfelt thanks are due to Dr. N.S. Rathore, DDG (Agricultural Education) for his immense support to the institute. We thank Dr. Pravin Puthran, ADG (Marine Fisheries) and other colleagues from the Fisheries Division for their co-operation and support. Our sincere thanks are due to the Members of Board of Management, Chairman and Members of Research Advisory Committee, Members of Academic Council, Institute Research Council, Extension Council, Board of Examiners and other institute level committees for their cooperation and support. I especially acknowledge the support of Team CIFE, and congratulate the publication team for bringing out this wonderful compilation of our activities.

(Gopal Krishna) r
Director/Vice-Chancellor





Executive Summary





Executive Summary

In the last 6 decades since its inception in 1961, ICAR-CIFE has made rapid strides in fisheries research and education. The institute has made remarkable contributions to the development of fisheries and the human resources in fisheries sector in India. The institute is endowed with a strong contingent of scientific and technical faculty. The institute offers post graduate programs in 11 disciplines under six divisions in its headquarters at Mumbai. The academic programs of CIFE are grouped under six divisions which offer post graduate programs in 11 disciplines. CIFE has well equipped laboratories which are accessible to students from across the disciplines. The library in CIFE has a collection of about 50000 books, subscription to 81 journals and access to online journal resources.

The research activities of CIFE are aligned with the needs of fisheries sector. Some of the recent research achievements are the development of a water filtration and treatment system, vaccines against *Edwardsiella tarda* and *Flavobacterium columnare*, PCR for the detection of enteric viruses in fish, a solar-powered cooler for storage of fresh fish, replacement of de-oiled rice bran with the leaf meal, genetic improvement of *Clarias magur*, zero water exchange carp hatchery and aquaponics. The institute is also a partner in ICAR network projects on disease surveillance,

antimicrobial resistance, repository of shrimp viruses, ornamental fish breeding and vaccines against fish pathogens. A National Agricultural Higher Education Project (NAHEP) on the "Development of Energy Efficient and Environment Protective Aquaculture Technologies for Degraded Soils", funded by World Bank & ICAR and involving an outlay of Rs. 19.94 crores, is in progress since 2018. In addition, the institute has 12 institutional and 20 externally funded projects. In 2018-19, the faculty of CIFE published 163 papers in peer reviewed scientific journals out of which 66 were in international journals and 96 in Indian journals. In addition, 11 book chapters, 28 popular articles, 40 training



manuals, and 43 technical bulletins were published. CIFE conducted 84 skill development programs, 18 farmers' meet, 14 trainings under tribal sub-plan (TSP), 21 exhibitions and two north east programs.

CIFE has a fairly good faculty strength of 82 scientists and 75 technical personnel. The faculty of this institute has participated in several national and international conferences and their researches have won several awards. The contributions of scientists are acknowledged by honoring them with institutional awards for teaching, research and institutional building activities during the annual day. The institute organized several conferences, symposia and meetings including the "Second Deans' Meet" of all fisheries colleges of the country. The third Students' Convention on "Next generation aquaculture: panacea to employment challenges" was held in CIFE in which students of fisheries colleges from all over the country participated. This was followed by the "Third International Symposium on Aquaculture and Fisheries Education (ISAFE3)" was organized by ICAR-CIFE in association with the Asian Fisheries Society, Malaysia in partnership with Indian Fisheries Association. This event was attended by more than 300 delegates from India and abroad. A National Higher Education Project (NAHEP)-sponsored workshop on "Genetic improvement of *Clarias magur*: present status and future prospects" was held in Kakinada Center of CIFE. The aim of this workshop was to popularize genetically improved magur

among farmers and promote magur culture in the country. Seeds of genetically improved magur were distributed to farmers.

During 2018-19, the institute conducted several important meetings such as Research Advisory Committee (RAC), Institutional Research Committee (IRC), Academic Council, Extension Council and Board of Management. The institute celebrated the Annual sports week, Vigilance awareness week, Yoga day, Swachhta abhiyaan, Hindi pakhwada, Industry day, Farmers' day, Sadbhavan divas, Republic and Independence day. The faculty and students won several recognitions in sports and cultural meets. In the ICAR West zone sports tournament, CIFE won 7 gold medals, 4 silver and a bronze medal. Faculty and students of this institute have won several individual recognitions from scientific societies and fora.

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 the administration. The unfailing support from the ICAR headquarters and cooperation from other fisheries institutions have only strengthened the institutes resolve to further fisheries development in the country that envisions a second Blue Revolution in the near future.



कार्यकारी सारांश

भा. कृ. अनु. प. – के. मा. शि. सं. ने 1961 में अपनी स्थापना के बाद से गत 6 दशकों में मत्स्य अनुसंधान और शिक्षा के क्षेत्र में तेजी से प्रगति की है। संस्थान ने भारत में मात्स्यिकी क्षेत्र में मात्स्यिकी और मानव संसाधन के विकास में उल्लेखनीय योगदान दिया है। संस्थान अपने वैज्ञानिक और तकनीकी के सुदृढ़ संकाय से संपन्न है। संस्थान मुंबई में अपने मुख्यालय में छह विभागों के अन्तर्गत 11 विषयों में स्नातकोत्तर शिक्षा प्रदान करता है। के. मा. शि. सं. में विषयों के अनुसार छात्रों के लिए सुलभ अच्छी तरह से सुसज्जित प्रयोगशालाएं हैं। के. मा. शि. सं. के पुस्तकालय में 50,000 से अधिक पुस्तकों का संग्रह, 81 पत्रिकाओं की सदस्यता और ऑनलाइन द्वारा जर्नल प्राप्त करने की सुविधा उपलब्ध है।

के. मा. शि. सं. की अनुसंधान गतिविधियों को मात्स्यिकी क्षेत्र की जरूरतों के साथ सम्मिलित किया जाता है। हाल की कुछ शोध उपलब्धियों में जल निस्पंदन और उपचार प्रणाली का विकास, ए. टार्ड और फ्लेवोबैक्टीरियम कॉलुम्वर के रोकथाम हेतु टीके, मछलियों में आंत्र कीटाणु का पता लगाने के लिए पी. सी. आर., ताजा मछलियों के भंडारण के लिए सौर ऊर्जा से संचालित कूलर, पत्ती वाले भोजन के साथ तेल वाले चावल की भूसी की प्रतिस्थापना, क्लारियस मगर का आनुवंशिक विकास, शून्य जल

विनिमय कार्प हैचरी और एकापोनिक्स शामिल हैं। भा. कृ. अनु. प. के रोग की निगरानी, रोगाणुरोधी प्रतिरोध, झींगा कीटाणु की प्रतिस्थापना, सजावटी मछली प्रजनन और मत्स्य रोगों के निदान के टीके जैसे नेटवर्क परियोजनाओं में यह संस्थान भी भागीदार है। संस्थान में राष्ट्रीय उच्च शिक्षा कार्यक्रम (NAHEP)- विश्व बैंक द्वारा 19.94 करोड़ के लागत के साथ वित्त पोषित अंतर्देशीय खारा जलकृषि पर बहु-विषयक अनुसंधान परियोजना प्रगति पर है। इसके अतिरिक्त संस्थान में 12 संस्थागत और 19 बाह्य वित्त पोषित परियोजनाएं हैं। के. मा. शि. सं. के संकाय ने 2018-19 में पीयर रिव्यूड साइंटिफिक जनरल्स में 163 लेख प्रकाशित किए, जिनमें से 66 अंतर्राष्ट्रीय जनरल्स में और 97 भारतीय जनरल्स में प्रकाशित हुए थे। इसके अतिरिक्त 11 पुस्तक अध्याय, 28 लोकप्रिय लेख, 40 प्रशिक्षण मैनुअल और 43 तकनीकी बुलेटिन प्रकाशित किए गए थे। के. मा. शि. सं. ने 84 कौशल विकास कार्यक्रम, 18 किसानों से मुलाकात, आदिवासी उप-योजना (TSP) के तहत 14 प्रशिक्षण, 21 प्रदर्शनियां और दो उत्तर-पूर्व कार्यक्रमों का आयोजन किया।

के. मा. शि. सं. में 82 वैज्ञानिकों और 75 तकनीकी कर्मियों का पर्याप्त संकाय है। इस संस्थान के संकाय ने कई राष्ट्रीय और अंतर्राष्ट्रीय सम्मेलनों में भाग लिया है और

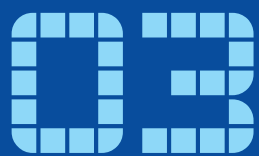


उनके अनुसंधान कार्यों को कई पुरस्कार प्राप्त हुए हैं। वार्षिक दिवस के दौरान शिक्षण, अनुसंधान और संस्थागत निर्माण गतिविधियों के लिए संस्थागत पुरस्कारों के साथ उन्हें सम्मानित करके वैज्ञानिकों के योगदान को प्रोत्साहित किया जाता है। संस्थान ने देश के समस्त मात्स्यिकी महाविद्यालयों के "दूसरे डिन्स मीट" सहित कई सम्मेलनों, संगोष्ठियों और बैठकों का आयोजन किया। के.मा.शि.सं. में "भावी पीढ़ी की जलकृषि: रोजगार की चुनौतियों के लिए रामबाण विषय पर तीसरा छात्र सम्मेलन आयोजित किया गया था, जिसमें देशभर के मत्स्य कॉलेजों के छात्रों ने भाग लिया था। इसके बाद एशियन फिशरीज सोसायटी, मलेशिया द्वारा इंडियन फिशरीज एसोसिएशन के साथ साझेदारी में आयोजित "जलकृषि और मत्स्य शिक्षा पर तीसरी अंतर्राष्ट्रीय संगोष्ठी (ISAFE3)" आयोजित की गई। इस कार्यक्रम में भारत और विदेश के 300 से अधिक प्रतिनिधियों ने भाग लिया। के.मा.शि.सं. के काकीनाडा केन्द्र में "क्लैरियस मागुर का आनुवंशिक विकास: वर्तमान स्थिति और भविष्य की संभावनाएं" विषय पर राष्ट्रीय उच्चतर शिक्षा कार्यक्रम (NAHEP) की कार्यशाला आयोजित की गई। इस कार्यशाला का उद्देश्य मछुआरों के बीच आनुवंशिक रूप से उपयुक्त मागुर को लोकप्रिय बनाना और देश में मागुर संवर्धन को बढ़ावा देना था। इस अवसर पर मछुआरों को आनुवंशिक रूप से लाभप्रद मागुर के बीज भी वितरित किए गए।

2018-19 के दौरान संस्थान में अनुसंधान सलाहकार समिति (आरएसी), संस्थागत अनुसंधान समिति (आईआरसी), अकादमिक परिषद, विस्तार परिषद और प्रबंधन बोर्ड जैसी कई महत्वपूर्ण बैठकें आयोजित की गईं। संस्थान ने वार्षिक खेलकूद सप्ताह, सतर्कता जागरूकता सप्ताह, योग दिवस, स्वच्छ भारत अभियान, हिन्दी पखवाड़ा, उद्योग दिवस, किसान दिवस, सद्भावना दिवस, गणतंत्र और स्वतंत्रता दिवस मनाया। संकाय और छात्रों ने खेलकूद और सांस्कृतिक कार्यक्रमों में कई पुरस्कार जीते। भा.कृ.अनु.प. पश्चिम क्षेत्रीय खेलकूद प्रतियोगिता में के.मा.शि.सं. ने 8 स्वर्ण पदक, ५ रजत और एक कांस्य पदक जीता। इस संस्थान के संकाय और छात्रों ने वैज्ञानिक सोसायटियों और मंचों से कई व्यक्तिगत पुरस्कार प्राप्त किए।

भा.कृ.अनु.प.-के.मा.शि.सं. के समर्पित संकाय, छात्रों और प्रशासन के प्रयास के कारण समाज-संगत वैज्ञानिक उन्नति और मत्स्य उद्योजक बनाने का कार्य संभव हो गया है। भा.कृ.अनु.प. के मुख्यालय और अन्य मत्स्य संस्थानों के प्रतिकूल सहयोग और समर्थन के कारण ही इस संस्थान को देश में भविष्य में मात्स्यिकी विकास के लिए दृढ़ संकल्पित किया है। यह सहयोग और समर्थन निकट भविष्य में दूसरी नीली क्रांति को लागू करता है।





Introduction





3.1. Introduction

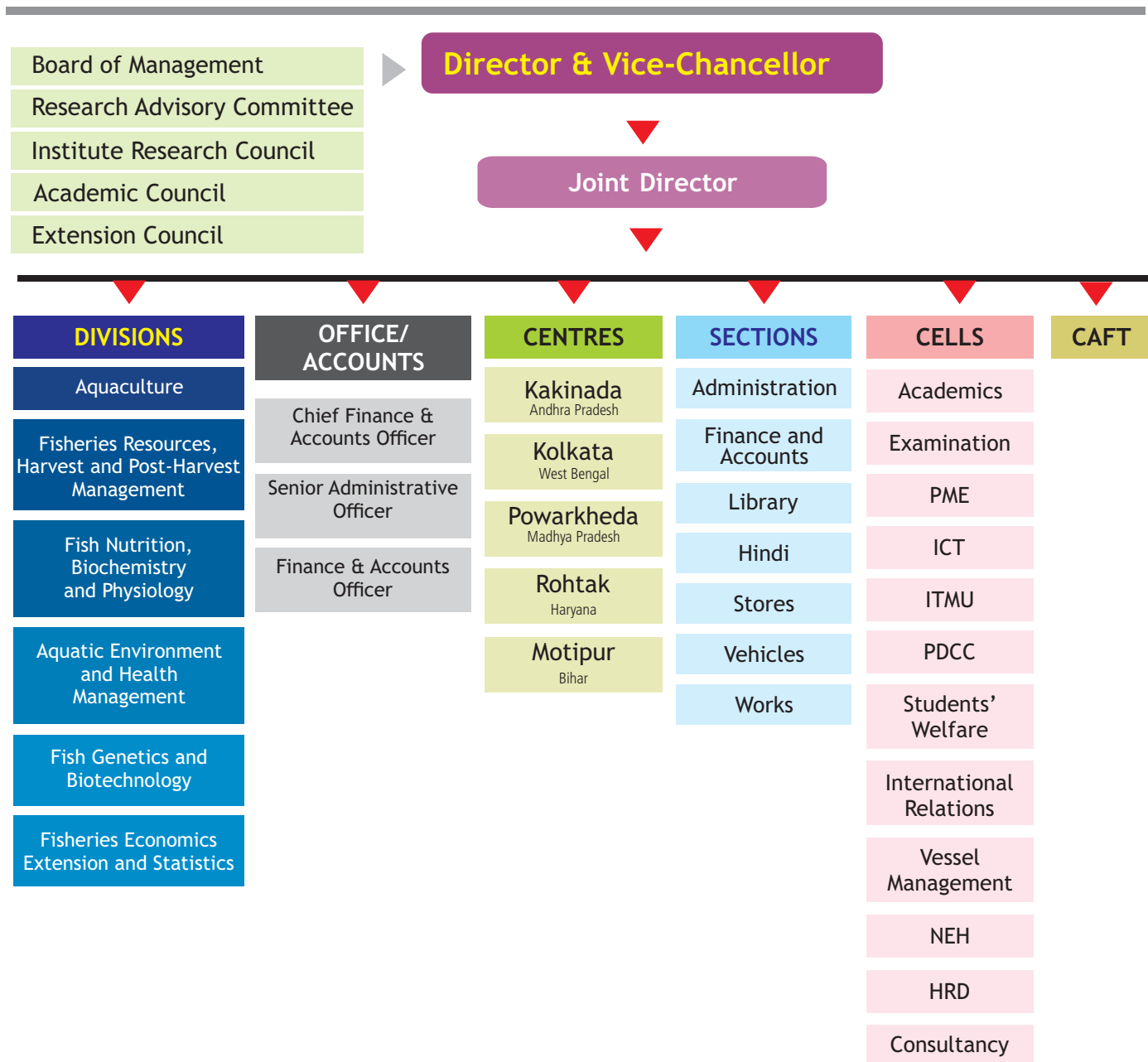
The ICAR-Central Institute of Fisheries Education (CIFE) was established as a training centre in 1961 under the administrative control of Ministry of Agriculture to promote fisheries education in the country by training officials of the state governments. In 1979, the institute was transferred to ICAR with the mandate of imparting fisheries education. The institute was granted the Deemed-to-be University status in 1989, offering post graduate education across 11 disciplines in fisheries science. Apart from post graduate education, the institute offers certificate courses and skills development programs. With the state-of-the-art facilities and laboratories, the institute has emerged as a Center of Excellence in HRD by producing competent manpower and catering to the needs of fisheries sector with its research in frontier areas of fisheries science. The activities of the institute are aligned in line with the national mandate of increasing fish production and farmers' income, with an ultimate goal of ensuring nutritional security. Apart from teaching and research, the institute plays a pivotal role in expansion of fisheries activities, enhancement of competence of fisheries professionals and dissemination of technology through training programs and extension activities.

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

3.2. Organogram

ICAR-CIFE, Mumbai



Board of Management

Chairman

Dr. Gopal Krishna

Members

Shri Bijay Kumar
Shri Chhabilendra Roul
Dr. K. Gopakumar
Prof. A. K. Mishra
Dr. A. Gopalakrishnan
Dr. P. Paul Pandian
Dr. N. P. Sahu
Dr. N. K. Chadha
Dr. K. V. Rajendran
Dr. S. N. Ojha
Dr. Aparna Chaudhari
Dr. B. B. Nayak
Dr. Neelam Saharan
Dr. Geetanjali Deshmukhe
Dr. Arpita Sharma
Dr. A. K. Balange
Dr. Manoj M. Sharma
Shri Rajendra Shantaram
Shri Mahesh Dashrath
Director (Finance) ICAR
Shri Mahesh B. Khubdikar

Extension Council

Chairman r

Dr. Gopal Krishna r

Members r

Shri Rajendra Jadhav r
Dr. J. K. Sundaray r
Dr. N. P. Sahu r
Dr. K. V. Rajendran r
Dr. N. K. Chadha r
Dr. S. N. Ojha r
Dr. B. B. Nayak r
Dr. S. Jahageerdar r
Dr. V. K. Tiwari r
Dr. Swadesh Prakash r
Dr. Ashutosh D. Deo r
Dr. Ananthan P. S.
Dr. Balange A. K. r
Dr. A. K. Singh r
Dr. Hari Krishna r
Dr. Arpita Sharma
(Member Secretary) r



Research Advisory Committee

Chairman r

Dr E. G. Silas (upto 15 October, 2018) r
Dr. Niranjana Sarangi (from 16 October, 2018) r

Members r

Dr. J. K. Jena r
Dr. Gopal Krishna r
Dr. T. K. Srinivasa Gopal r
Dr. P. N. Pandey r
Dr. Sridhar Sivasubbu r
Dr. Indrani Karunasagar r
Dr. K. Pani Prasad (Member Secretary) r



Academic Council

Chairman r

Dr. Gopal Krishna r

Members r

Dr. N. S. Rathore r

Dr. S. Felix r

Dr. R. C. Srivastava r

Dr. Devang V. Khakhar r

Dr. Kuldeep K. Lal r

Dr. Chindi Vasudevappa r

Dr. R. R. B. Singh r

Dr. N. P. Sahu r

Dr. N. K. Chadha r

Dr. S. N. Ojha r

Dr. N. P. Sahu r

Dr. Aparna Chaudhari r

Dr. K. V. Rajendran r

Dr. B. B. Nayak r

Dr. Naresh S. Nagpure r

Dr. S. Jahageerdar r

Dr. Latha Shenoy r

Dr. G. Deshmukhe r

Dr. G. H. Pailan r

Dr. P. P. Srivastava r

Dr. Neelam Saharan r

Dr. R. P. Raman r

Dr. Munil Kumar r

Dr. Parimal Sardar r

Dr. Swadesh P. Tiwari

Dr. Rama Sharma r

Dr. A. K. Balange r

Dr. Megha K. Bedekar r

Dr. Shreedharan r

Dr. Muralidhar Ande r

Dr. Shashi Bhushan r

President, PGSSU r

Representative of ACM of PGGSU r

Shri Mahesh B. Khubdikar r

(Member Secretary) r



3.3. Staff Position (2018-19)

Category Wise

CIFE Staff	Sanctioned	In position	Vacant
RMP	02	01	01
Scientific	104	82	22
Technical	106	75	31
Administrative	64	42	22
Skilled Supporting	69	48	21
Non-ministerial	01	01	00
Total	346	268	78

3.4. Budget (2018-19)

Rs. in Lakh

S. No.	Head	Sanctioned/ Balance C/f	Received	Expenditure Incurred
1.	Institute Expenditure	8,774.53	8,784.60	8,704.42 r
2.	CAFT	21.02	-	6.85 r
3.	SDU	147.76	116.35	82.99 r
4.	Library strengthening (SDAE)	63.47	11.53	59.50 r
5.	Scheduled caste sub-plan (SDAE)	-	100.00	84.78 r
6.	NAHEP	-	861.32	500.73 r
7.	Externally Funded Projects	246.44	173.00	233.23 r
Total		9,253.22	10,046.80	9,672.50

Revenue generation: Rs. 105.34 Lakhs r



Academic Achievements



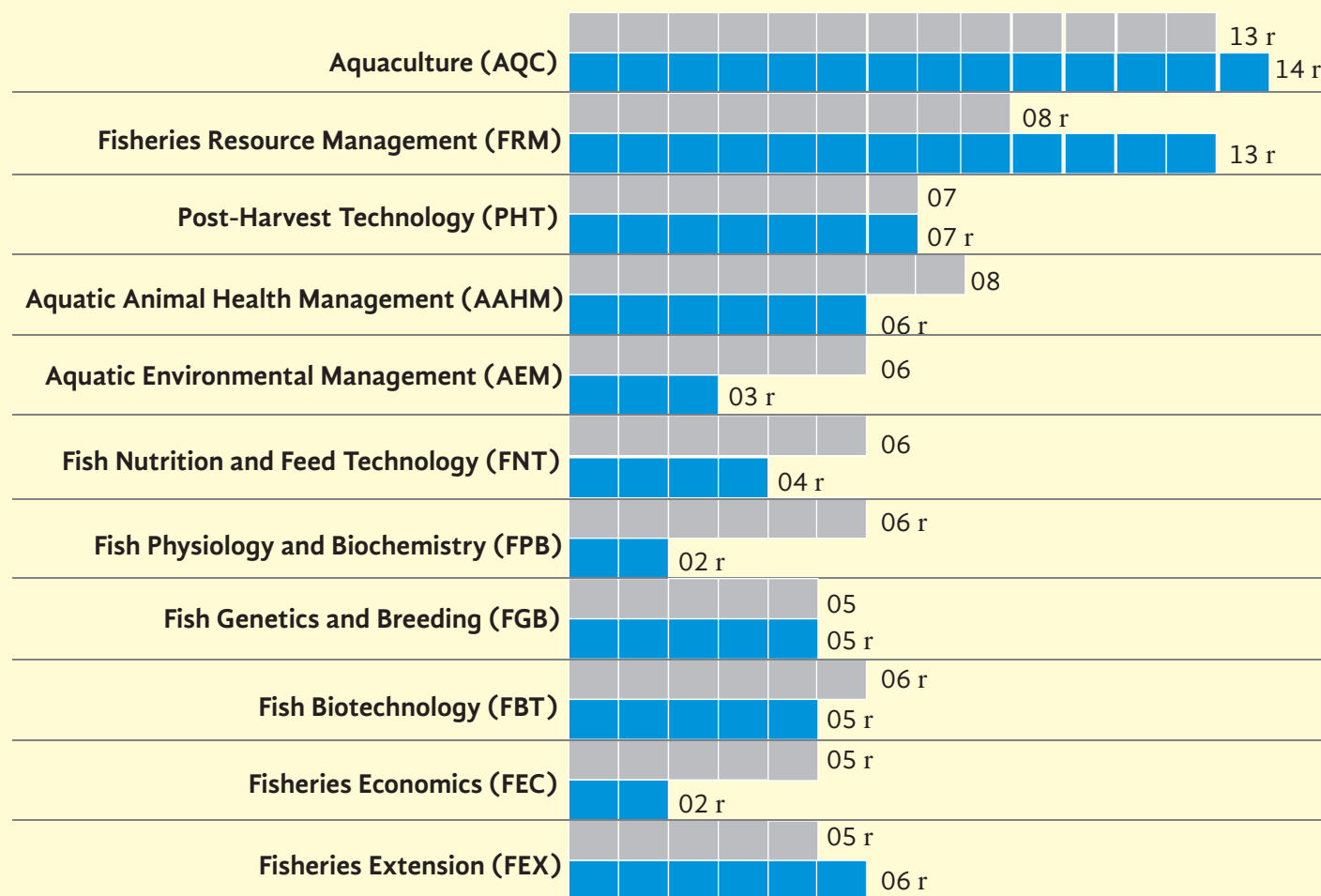
Highlights

Degress awarded	114
Guest faculty (from abroad and India)	42
Students Placements	55
Overseas Ph.D.	03
Number of conferences/symposia attended by students (International and National)	13
Total number of papers presented (from India and abroad)	52
Honours and awards received	32



4.1 Enrollments

A total of 67 students have enrolled for the doctoral programme and 75 students have enrolled for the master programme which includes one foreign student from Tanzania.



Students enrolled during the year 2018-2019

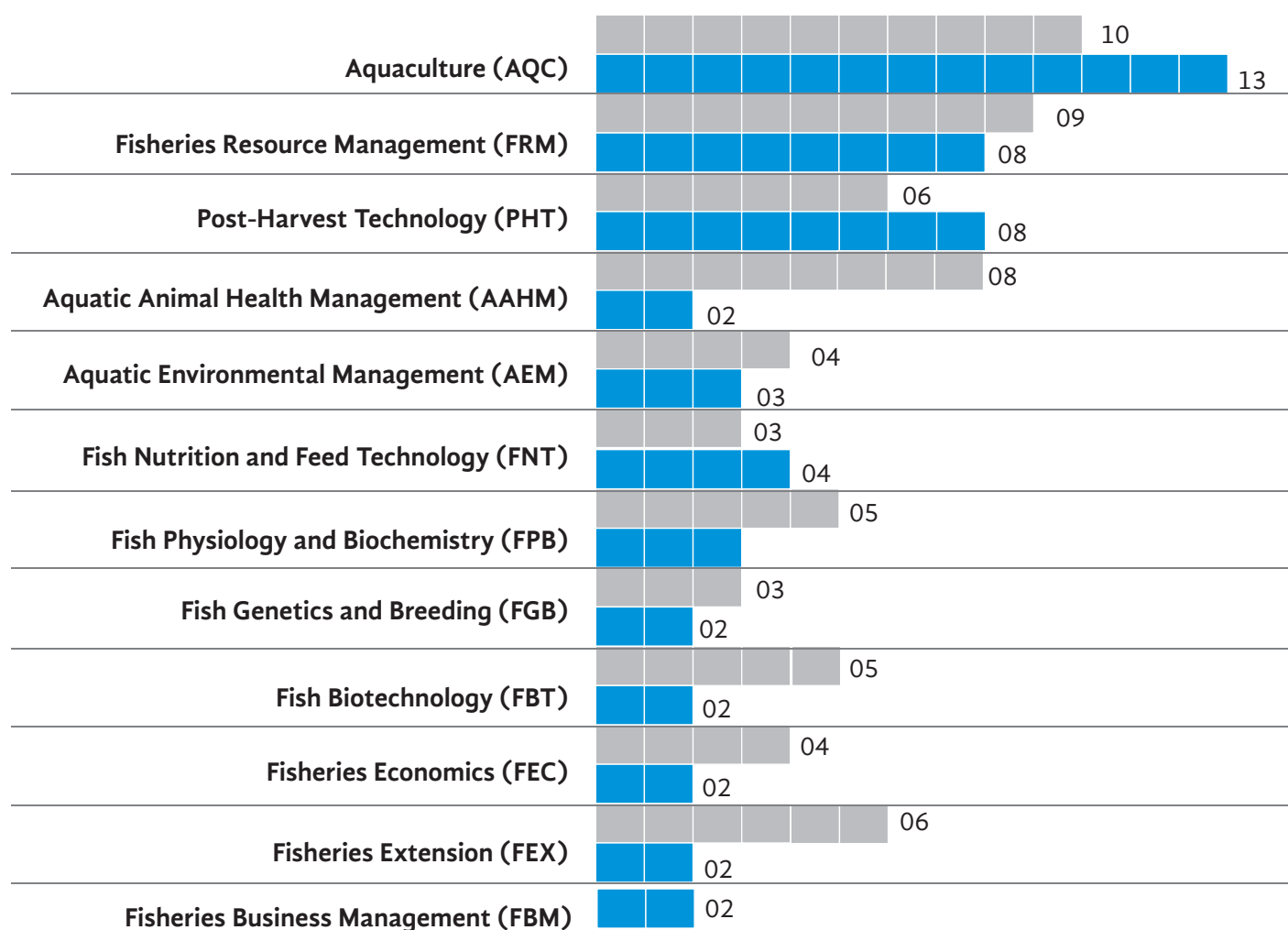
- M.F.Sc. (2018-20 Batch) - 75
- Ph.D. (2018-21 Batch) - 67

4.2. Foreign student enrolled during 2018-19 for the M.F.Sc. programme



Mr. John Daudi, Aquaculture, ID No. AQC-MA-08-13
Country: Tanzania

4.3 Results



■ No. of students awarded with M.F.Sc. degree during the year 2018 : 63

■ No. of students awarded Ph.D. degree during 2018-2019 : 51

4.4. List of Dissertations Submitted by M. F. Sc. Students

Sr. No	Name of the student Registration no.	Major adviser	Topic
1. Aquaculture			
1.	Ms. Puja Chakraborty AQC-MA6-01	Dr. Murlidhar P. Ande	Utilization of detoxified Jatropha kernel cake in the diet of <i>Clarias magur</i> (Hamilton, 1822) fingerlings for growth performance r
2.	Mr. Bullo Angkha AQC-MA6-02 r	Dr. A. K. Verma	Microbial solubilisation of mineral rocks by <i>Bacillus</i> sp. and its effect on plant with tilapia in aquaponics system r
3.	Mr. Sandeep Shankar Pattanaik AQC-MA6-04	Dr. P. B. Sawant	Dietary incorporation of carotenoid-protein extracted from shrimp shell waste for colour enhancement in Oscar, <i>Astronotus ocellatus</i> r (Agassiz, 1831) r
4.	Ms. Sunumol P. S. AQC-MA6-05	Dr. K. Dube Rawat	Biofloc as a dietary ingredient and its impact on growth and physiological response of <i>Pangasianodon hypophthalmus</i> (Sauvage, 1878) fingerlings in aquaponic system r
5.	Ms. Ritty Maria Thomas AQC-MA6-06	Dr. A. K. Verma	Study on bio-integration of fish and plant in low saline inland water r
6.	Ms. Sanchita Naskar AQC-MA6-07	Dr. G. H. Pailan	Evaluation of organic manures to reduce GHG (greenhouse gas) production from aquaculture at varying salinity level r
7.	Mr. Ajoy Chutia AQC-MA6-09	Dr. Babitha Rani A.M.	Chitosan inclusion for biofloc development and its impact on growth and physiological response in GIFT Tilapia r
8.	Ms. Sangavi S. AQC-MA6-11	Dr. P. B. Sawant	Effect of dietary incorporation of oil palm kernel meal on growth and physio-metabolic response of Rohu, <i>Labeo rohita</i> (Hamilton, 1822) fingerlings r
9.	Mr. Gavin Raplang Nongsiej AQC-MA6-12	Dr. V. K. Tiwari	Study on growth and survival of <i>Cyprinus carpio</i> r (Linnaeus, 1758) larvae reared in inland saline water r
10.	Mr. Chandroshakar Biswas AQC-MA6-15	Dr. S. Dasgupta	Effect of temperature on sex differentiation in <i>Cyprinus carpio</i> (Linnaeus, 1758) r
2. Fisheries Resources Management			
11.	Mr. Abhijit Mallik FRM-MA6-01	Dr. Shashi Bhushan	Stock structure analysis of <i>Priacanthus hamrur</i> (Forsskal, 1775) from Indian waters r
12.	Ms. Chellamanimegalai P. FRM-MA6-02 r	Dr. G. Deshmukhe	Taxonomical study of genus <i>Grateloupia</i> C. Agardh (Halymeniales, Rhodophyta) based on morphology and biochemical composition r
13.	Ms. Avadootha Shivakrishna FRM-MA6-03	Dr. Zeba Jaffer Abidi	The impact of aquaculture on natural wetland ecosystem – Kolleru Lake r
14.	Ms. Neethu Jose FRM-MA6-04	Dr. A. K. Jaiswar	Taxonomic evaluation of genus <i>Thryssa</i> r (Family : Engraulidae) from Indian waters r
15.	Mr. Kesavan S. FRM-MA6-05	Dr. Latha Shenoy	Appraisal of non-conventional & low value fish resources from trawl along Mumbai coast r
16.	Ms. Jenishma J.S. FRM-MA6-06	Dr. Latha Shenoy	Geo-spatial mapping and catch composition of non-conventional & low value fish resources from trawl along Mumbai coast r

17.	Mr. Amom Mahendrajit FRM-MA6-07	Dr. Shashi Bhushan	Study on the direct sources of metal in the fish body and their distribution in different organs r
18.	Mr. Kabin Medhi FRM-MA6-08	Dr. B. K. Bhattacharya	Study on Ichthyofaunal diversity, productivity and trophic index in relation to macrophyte infestation in selected beels of Kamrup District of Assam (India) r
19.	Ms. Kanchi Bhargavi FRM-MA6-09	Dr. G. Deshmukhe	Study on growth and biochemical composition of <i>Ulva</i> species from thermally polluted and non-polluted sites along west coast of India r

Post-Harvest Technology

20.	Mr. P. Ramakrishna Reddy PHT-MA6-01	Dr. B. B. Nayak	Effect of gamma irradiation on histamine forming bacteria r
21.	Ms. Pooja Saklani PHT-MA6-02 r	Dr. Sanath Kumar H.	Survival dynamics of methicillin resistant <i>Staphylococcus aureus</i> (MRSA) in fish and fishery products r
22.	Ms. Kasturi Chattopadhyay PHT-MA6-03	Dr. K. A. Martin Xavier	Effect of chitosan inclusion on the functional properties on emulsified sausage from <i>Pangasius mince</i> r
23.	Mr. Sambit Kisore Das PHT-MA6-04	Ms. Manjusha L.	Incidence of <i>Cronobacter</i> species in fish and shellfish r
24.	Ms. Barkha Rani Chetia PHT-MA6-06	Dr. B. B. Nayak	Detection and isolation of <i>Arcobacter butzleri</i> r bacteriophage r
25.	Mr. Mohammed Akram J. S. PHT-MA6-07	Dr. Amjad K. Balange	Assessment of meat quality of <i>Litopenaeus vannamei</i> reared in inland saline water r

Aquatic Animal Health Management

26.	Mr. Arul Murugan M. AAH-MA6-01	Dr. K. V. Rajendran	A histopathological survey with a focus on hepatopancreas and gut of farmed Pacific White Shrimp (<i>Penaeus (L) vannamei</i>) r
27.	Mr. Vismai Naik T. AAH-MA6-02	Dr. K. Pani Prasad	Surface display expression of infectious myonecrosis virus major capsid protein on <i>Saccharomyces cerevisiae</i> (Hansen, 1883) – A pilot study r
28.	Mr. Akash J. S. AAH-MA6-03	Dr. M. K. Bedekar	Expression profiling of <i>Edwardsiella tarda</i> r induced Heat Shock Proteins in <i>Labeo rohita</i> (Hamilton, 1822) r
29.	Ms. Pushpa Kumari AAH-MA6-04	Dr. R. P. Raman	Efficacy of Neem (<i>Azadirachta indica</i>) extract against <i>Argulus</i> infection in goldfish (<i>Carassius auratus</i>) r
30.	Mr. Dhayanath M. AAH-MA6-05	Dr. K. Pani Prasad	Identification and molecular characterization of antimicrobial resistance associated with gut microflora of cultured <i>Penaeus vannamei</i> (Boone, 1931) r
31.	Ms. Vandana V. R. AAH-MA6-06	Dr. K. V. Rajendran	Studies on the microsporidian and myxozoan parasites infecting mudskippers r
32.	Ms. Bharathi Rathinam R. AAH-MA6-07	Dr. Gayatri Tripathi	A study on parasitic and bacterial pathogens in cage cultured pangasius catfish <i>Pangasianodon hypophthalmus</i> (Savage, 1878) from selected reservoirs of Maharashtra r
33.	Mr. Mittapalli Ramesh AAH-MA6-08	Dr. R. P. Raman	Antiparasitic effect of pyrethrum (<i>Tanacetum</i> sp.) extract on <i>Argulus</i> infection in goldfish (<i>Carassius auratus</i>) r

Aquatic Environmental Management

34.	Mr. Tapas Paul AEM-MA6-01	Dr. Saurav Kumar	Effect of temperature and pH on triclosan toxicity in <i>Pangasianodon hypophthalmus</i> r
35.	Mr. Sutanu Karmakar AEM-MA6-02	Dr. Kundan Kumar	Effect of triclosan on antibiotic sensitivity of fish pathogenic bacteria from sewage-fed aquaculture ponds r
36.	Mr. Chittaranjan Raul AEM-MA6-03	Dr. Vidya Shree Bharti	Effects of Biochar on aquatic primary productivity and pond sediment r
37.	Mr. Manickavasagam S. AEM-MA6-06	Dr. S. P. Shukla	Designing, fabrication and field trials of plastic removal devices r

Fish Nutrition and Feed Technology

38.	Mr. Manas Kumar Maiti FNT-MA6-01	Dr. N. P. Sahu	Utilisation of <i>Hygrophila spinosa</i> leaf meal in the diet of <i>Labeo rohita</i> (Hamilton, 1822) r
39.	Ms. Sraddhanjali Sahoo FNT-MA6-02	Dr. K. K. Jain	Alternate feeding strategies to enhance the utilization of leaf meal-based diet in <i>Labeo rohita</i> (Hamilton, 1822) fingerling r
40.	Ms. Deepjyoti Bora FNT-MA6-03	Dr. Ashutosh D. Deo	Evaluation of mixed leaf meal in the diet of <i>Labeo rohita</i> (Hamilton, 1822) fingerling r

Fish Physiology and Biochemistry

41.	Mr. Dharmaraj Patro FPB-MA6-01	Dr. P. P. Srivastava	Evaluation of extracted <i>Mentha arvensis</i> leaf meal in the diet of <i>Cyprinus carpio</i> (Linn., 1758) reared in inland saline water r
42.	Mr. Khandakar Jahanorkram FPB-MA6-02	Dr. Subodh Gupta	Evaluation of chicken weed (<i>Stellaria media</i>) leaf protein concentrate on growth and immune response in <i>Labeo rohita</i> (Hamilton, 1822) r
43.	Mr. Arya P. FPB-MA6-04	Dr. P. P. Srivastava	Effects of alternate feeding on Gluconeogenic Enzyme, Glucose-6-Phosphatase (G-6-Pase) expression in <i>Labeo rohita</i> (Hamilton, 1822) fed with extracted Lemon grass (<i>Cymbopogon citratus</i>) leaf meal r
44.	Mr. Nitesh Gurung FPB-MA6-05 r	Dr. Sujata Sahoo	Expression study of <i>IGF1</i> and <i>IGFBP1</i> Gene in <i>Labeo rohita</i> (Hamilton, 1822) fed with <i>Ipomea aquatica</i> leaf meal based diet r
45.	Mr. Diganta Chetia FPB-MA6-06	Dr. Subodh Gupta	Pharmacokinetics and physio-metabolic responses of emamectin benzoate in <i>Labeo rohita</i> (Hamilton, 1822) r

Fish Genetics and Breeding

46.	Ms. Saumya Pandey FGB-MA6-01	Dr. S. Jahageerda	<i>In silico</i> comparative study of melanocortin 1 receptor and its modulators in selected fish species r
47.	Ms. Bhumika Arora FGB-MA6-02	Dr. Rupam Sharma	Identification and expression analysis of micro RNAs and their target genes in <i>Clarias magur</i> r (Hamilton, 1822) r
48.	Ms. K. Smrithi FGB-MA6-04	Dr. S. Jahageerda	A genetic study on ornamentation in Guppy <i>Poecilia reticulata</i> (Peters, 1859) r

Fish Biotechnology

49.	Mr. Manabesh Mahapatra FBT-MA6-02	Dr. Aparna Chaudhari	<i>In silico</i> mining of <i>Clarias magur</i> (Hamilton, 1822) transcriptome data for novel proteins and applications r
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50.	Ms. Safna P. FBT-MA6-03	Dr. Gireesh Babu P.	Expression profiling of DNA repair genes in caspase-3 knockdown zebrafish exposed to DNA damage r
51.	Mr. Sathiyarayanan A. FBT-MA6-04	Dr. Mukunda Goswami	Establishment of cell culture system from <i>Pangasius hypophthalmus</i> (Sauvage, 1878) r
52.	Ms. Hemamalini N. FBT-MA6-05	Dr. Aparna Chaudhari	Full-Length cDNA characterization and expression profiling of kisspeptin and its receptor in <i>Clarias magur</i> r
53.	Ms. Sonal Suman FBT-MA6-06	Dr. A. Pavan Kumar	Development of markers for identification of the hybrid of <i>Clarias magur</i> (Hamilton, 1822) r

Fisheries Economics

54.	Ms. Jyotimanjari Sahoo FEC-MA6-01	Dr. Ananthan P. S.	Human resource accounting of ICAR-CIFE's higher education r
55.	Mr. Mohammed Meharoof FEC-MA6-02	Dr. Swadesh Prakash	Economic impact assessment of implementation of minimum legal size of fishers of Kerala r
56.	Ms. Dusanapudi Lekshmi S.N.A. FEC-MA6-03	Dr. Rama Sharma	Comparative economics of conventional and semi-organic <i>Litopenaeus vannamei</i> (Boone, 1931) farming practices in Andhra Pradesh r
57.	Ms. Tenji Pem Bhutia FEC-MA6-05	Mr. Vinod Kumar Yadav	Impact of modern retail markets on fish consumption in Kolkata, West Bengal r

Fisheries Extension

58.	Mr. Chinmaya Nanda FEX-MA6-01	Dr. S. N. Ojha	Climate resilience of fishers in Chilika lake region r
59.	Ms. Dhenuvakonda Kiranmayi FEX-MA6-02	Dr. Arpita Sharma	Design of Mobile App prototype for fish farmers of Telangana r
60.	Ms. Meher Siddhika Vilas FEX-MA6-03	Dr. Ananthan P. S.	Designing a Mobile App prototype for online seafood sale and purchase r
61.	Mr. Subhash Kumar Banjare FEX-MA6-04	Dr. S. N. Ojha	Adoption of indigenous technical knowledge in fisheries by tribal communities of Bastar, Chhattisgarh r
62.	Mr. Kukhrunelu Keyho FEX-MA6-05	Dr. S. N. Ojha	Exploring aquaculture entrepreneurship development process for students in Nagaland r
63.	Mr. Rajeshwaran M. FEX-MA6-06	Dr. Ananthan P. S.	Career aspirations of youth in fishing communities r

4.5 List of Students Awarded Ph.D. Degree (2018- 2019)

Sr. No.	Name of the student Regn. No. Batch	Topic of the thesis	Major Advisor	Date of Viva-voce
1.	Ms. H. Mandakini Devi PHT-PA1-05 2011-14	Development of food packing film using gelatin extracted from surimi refiner discharge r	Dr. Amjad K. Balange	2 April, 2018 r
2.	Mr. Praveen Kumar G. PHT-PA3-07 2013-16	Development of effective curing methods for preservation of <i>Pangasius hypophthalmus</i> (Sauvage, 1878) r	Dr. Amjad K. Balange	7 April, 2018 r
3.	Mr. Abhishek Thakur PHT-PA2-05 2012-15	Diversity and function of ammonia oxidizing genes in bacteria from seafood processing waste water r	Dr. B. B. Nayak	12 April, 2018 r
4.	Ms. Tincy Verghese FPB-PA1-02 2011-14	Cellular and molecular responses of metabolic modifiers in <i>Cirrhinus mrigala</i> (Hamilton, 1822) exposed to hypoxia r	Dr. A. K. Pal	16 April, 2018 r
5.	Mr. Gajanan S. Ghode AAH-PA1-05 2011-14	Molecular characterization of Toll-like Receptor (TLR-4) and expression analysis of selected downstream molecules of <i>Pangasianodon hypophthalmus</i> after exposure to <i>Edwardsiella tarda</i> r	Dr. G. Rathore	18 April, 2018 r
6.	Mr. R. Srinu PHT-PA3-05 2013-16	Prevalence diversity and pathogenic potentials of <i>Acrobacter</i> spp. in sea foods r	Dr. B. B. Nayak	19 April, 2018 r
7.	Mr. Irfan Ahmad Bhat FGB-PA4-01 2014-17	Development and characterization of chitosan nanoparticles loaded with eurycomanone for enhancing reproductive output in <i>Clarias magur</i> r (Hamilton, 1822) r	Dr. Rupam Sharma	21 April, 2018 r
8.	Ms. Nimmy Jousy FBT-PA2-03 2012-15	Marker based pedigree identification and genetic parameter estimation in captive bred <i>Clarias batrachus</i> r (Linnaeus, 1758)	Dr. Shrinivas Jahageerdar r	23 April, 2018 r
9.	Mr. Anuraj A. AQC-PA1-03 2011-14	Micropropagation of selected seaweeds in Andaman & Nicobar Islands r	Dr. Chandra Prakash	21 May, 2018 r
10.	Mr. Suhas M. Wasave FEX-PA2-03 2012-15	Study of marine fisheries co-operatives societies with reference to governance and members satisfaction : A case of Maharashtra r	Dr. Arpita Sharma	1 June, 2018 r
11.	Ms. Suman Kumari FRM-PA1-03 2011-14	Plankton dynamics in Inland floodplain wetlands of West Bengal r with reference to enclosure culture r	Dr. A. K. Jaiswar	4 June, 2018 r
12.	Ms. Minimol V. A. PHT-PA1-02 2011-14	Prevalence and molecular characterization of the pandemic clones of <i>Vibrio parahaemolyticus</i> r in seafood	Dr. Sanath Kumar H.	6 August, 2018 r

13.	Mr. Katare Milind Bhagwan AQC-PA3-11 2013-16	Masculinization in dwarf gourami, <i>Trichogaster lalius</i> (Hamilton, 1822) through aromatase inhibitors	Dr. W. S. Lakra	25 August, 2018
14.	Mr. Irshad Ahmad Hajam AQC-PA4-02 2014-17	Development and evaluation of anti-inhibin antibody on oocyte maturation in <i>Clarias batrachus</i> (Linnaeus, 1758)	Dr. Neelam Saharan	28 August, 2018
15.	Ms. Rashmi S. Ambulkar AQC-PA3-13 2013-16	Comparative evaluation of fresh and cryopreserved milt for quality seed production of <i>Clarias batrachus</i> (Linnaeus, 1758)	Dr. C. S. Chaturvedi	6 September, 2018
16.	Ms. Anusha D.L. Wickramasinghe AEM-PA4-04 2014-17	Designing and performance evaluation of a column based water filtration device for polyaromatic hydrocarbons (PAHs) removal	Dr. S. P. Shukla	10 September, 2018
17.	Mr. Murali S. FGB-PA1-01 2011-14	Comparative genomics analysis to identify potential therapeutic targets for major fish bacterial pathogens	Dr. Shrinivas Jahageerdar	22 September, 2018
18.	Mr. Abubakar Usman AQC-PA5-16 2015-18	Application of GIS and remote sensing in selected limnological aspects of Powai Lake, Mumbai, India	Dr. Kiran D. Rawat	27 September, 2018
19.	Mr. Bharat M. Yadav FEX-PA4-04 2014-17	Gender analysis of ornamental fish enterprises in Maharashtra	Dr. Arpita Sharma	6 October, 2018
20.	Ms. Jasmin F. FRM-PA2-06 2012-15	Fishery, distribution, biology and a exploitation status of <i>Sepia aculeata</i> Van Hasselt, 1835 off Andhra Coast	Dr. Latha Shenoy	6 October, 2018
21.	Ms. Prathvi Rani FBM-PA1-03 2011-14	Impact of proposed EU-India free trade agreement (FTA) on Indian-EU seafood trade	Dr. Nalini Ranjan K	3 November, 2018
22.	Ms. Shamna N. FNT-PA2-02 2012-15	Expression of stress linked enzymatic antioxidants in <i>Labeo rohita</i> and its modulation through nutraceuticals	Dr. N. P. Sahu	14 November, 2018
23.	Mr. Rajesh M. FPB-PA2-01 2012-15	Nutritional regulation of muscle growth related genes in <i>Schizothorax richardsonii</i> (Gray, 1832)	Dr. A. K. Singh	22 November, 2018
24.	Mr. Mir Ishfaq Nazir FNT-PA5-02 2015-18	Studies of selected digestive enzymes during ontogenic development and their responses to diet in <i>Clarias magur</i> (Linnaeus, 1758) juveniles	Dr. K. K. Jain	24 November, 2018
25.	Ms. Chirom Archana AQC-PA3-01 2013-16	Combating the toxicity of pendimethalin in <i>Cyprinus carpio</i> fingerlings through bioremediation and dietary manipulation	Dr. Neelam Saharan	24 November, 2018
26.	Ms. Manjusha L. PHT-PA2-01 2012-15	Human enteric viruses in seafood and the coastal environment	Dr. B. B. Nayak	26 November, 2018

27.	Mr. Showkat Ahmad Dar FPB-PA5-01 2015-18	Studies on regulation and expression of Ghrelin Gene in <i>Labeo rohita</i> (Hamilton, 1822) under different feeding regimes r	Dr. P. P. Srivastava	26 November, 2018 r
28.	Mr. Sarvendra Kumar FNT-PA4-01 2014-17	Optimizing the utilization of De-oiled rice bran in the diet of <i>Labeo rohita</i> (Hamilton, 1882) based on metabolic and molecular responses r	Dr. N. P. Sahu	27 November, 2018 r
29.	Mr. Elzein M.H. Fahal AQC-PA4-14 2014-17	Effects of <i>Moringa oleifera</i> extracts on growth, maturation and reproductive performance of Asian catfish <i>Clarias batrachus</i> r (Linnaeus, 1758) r	Dr. Neelam Saharan	28 November, 2018 r
30.	Ms. Thankam T. Paul FRM-PA3-07 2013-16	Ichthyo-faunal diversity and biology of selected endemic fish species of Pothundi and Peechi reservoirs of Kerala r	Dr. Asha T. Landge	28 November, 2018 r
31.	Mr. Aditya Kumar AQC-PA2-07 2012-15	Study of ontogeny of digestive system and evaluation of weaning strategies in Asian stinging catfish, <i>Heteropneustes fossilis</i> (Bloch, 1794) during larval development r	Dr. P. K. Pradhan	29 November, 2018 r
32.	Mr. Naorem Dinesh Singh FEC-PA5-03 2015-18	Propagative casual price transmission in Indian Shrimp export markets r	Dr. M. Krishnan	3 December, 2018 r
33.	Mr. Subal Kumar Roul FRM-PA2-01 2012-15	Taxonomic revision of family belonidae, and biology and stock assessment of <i>Ablenneshians</i> r (Valenciennes, 1846) along Kerala Coast r	Dr. A. K. Jaiswar	3 December, 2018 r
34.	Mr. Renjith R.K. FRM-PA2-02 2012-15 r	Species differentiation of family Teraponidae along Indian Coast r	Dr. A. K. Jaiswar	4 December, 2018 r
35.	Mr. Raju Baitha AAH-PA2-01 2012-15	Study of community ecology of metazoan parasites of selected fishes from lower stretch of river Ganga in West Bengal r	Dr. S. K. Manna	4 December, 2018 r
36.	Mr. Deepak Agarwal FBT-PA4-02 2014-17	Transcriptome analysis of brain and gonads at different maturity stages of <i>Clarias magur</i> r (Hamilton, 1822) r	Dr. Gireesh Babu P.	5 December, 2018 r
37.	Ms. E.M. Chhandaprajna Darsini FRM-PA2-05 2012-15	Biology and stock assessment of <i>Sourida undosquamis</i> (Richardson, 1848) along Mumbai Coast r	Dr. S. K. Chakraborty	6 December, 2018 r
38.	Mr. Kharatmol Balaji Rudrappa FRM-PA5-08 2015-18 r	Study on compliance of trawl net fishery of Maharashtra Coast, India with provisions of FAO CCRF r	Dr. Latha Shenoy	21 December, 2018 r
39.	Ms. K.K.T. Nuwansi AQC-PA5-15 2015-18	Phytoremediation and utilization of aquaculture effluents in aquaponic recirculating system r	Dr. A. K. Verma	22 December, 2018 r
40.	Mr. Venkatesh R. Thakur AQC-PA2-03 2012-15	Abundance of clown fishes and reproductive performance of skunk clownfish, <i>Amphiprion akallopisos</i> r (Bleeker, 1853) from Andaman Sea	Dr. A. K. Verma	15 January, 2019 r

41.	Ms. Shilta M.T. AQC-PA2-05 2012-15	Studies on the biology of picnic seabream <i>Acanthopagrus berda</i> r (Forsskal, 1775) from Calicut, South-West coast of India r	Dr. N. K. Chadha	15 January, 2019 r
42.	Mr. Vivek Shrivastava AQC-PA1-12 2011-14	Effect of stocking densities and partial replacement of dietary animal protein and lipid with soybean on growth and survival r of <i>Fenneropenaeus merguensis</i> r (de Man, 1888) r	Dr. N. K. Chadha	16 January, 2019 r
43.	Mr. Ratheesh Kumar R. AEM-PA2-01 2012-15	Spatio-temporal variations in stationary bag net fishery of Maharashtra coast with reference r to environmental factors r	Dr. A. P. Dineshababu	17 January, 2019 r
44.	Mr. Raju M. Timbile AQC-PA2-11 2012-15	Studies on growth, survival and reproduction of discus, <i>Symphysodona equifasciatus</i> Pellegrin, 1904 r	Dr. Paramita B. Sawant	18 January, 2019 r
45.	Ms. Piyashi Deb Roy FBM-PA1-02 2011-14	Resource use patterns, trade-offs and governance strategies for fisheries development in lake Rudrasagar, Tripura r	Dr. M. Krishnan	21 January, 2019 r
46.	Ms. Divya Viswambharan FRM-PA2-03 2012-15	Biology and stock delineation of the razor moonfish, <i>Mene maculata</i> r (Block & Schneider, 1801) along the Konkan-Malabar coast of India r	Dr. A. K. Jaiswar	23 January, 2019 r
47.	Ms. Mocherla Bhargavi Priyadarshini PHT-PA5-06 2015-18 r	Effect of different washing methods and natural additives on the quality and stability of <i>Tilapia surmi</i> r	Dr. A. K. Balange	24 January, 2019 r
48.	Mr. Nagung Camder Tok FNFT-PA1-01 2011-14	Growth and immunomodulatory responses of <i>Labeo rohita</i> r (Ham, 1822) to dietary <i>Houttuynia cordata</i> Extract r	Dr. K. K. Jain	31 January, 2019 r
49.	Mr. Devananda Uchoi PHT-PA2-02 2012-15	Proteolytic and biological amine forming bacteria from fermented fish products of North-East India r	Dr. B. B. Nayak	5 February, 2019 r
50.	Ms. Rathi Bhuvaneswari G. AEM-PA1-02 2011-14	Bioremediation of an organophosphorus insecticide Chlorpyrifos through algae and bacteria r	Dr. S. P. Shukla	8 February, 2019 r
51.	Ms. Neha W. Qureshi FEC-PA3-01 2013-16	The amplified economics of an intrinsic common use resource- The Dal Lake r	Dr. M. Krishnan	13 March, 2019 r

4.6. Lectures Delivered in Other Universities/Institutes

Name of the faculty	Title of lecture	Event/Venue	Date
Dr. Sunil Kumar Nayak	Package of practices of local fisheries enterprises, flagship programmes of Central and state fisheries departments	IECCI, Vidyasagar Institute of Management (VIM), Bhopal, Madhya Pradesh	9 June, 2018 6 August, 2018 8 October, 2018 22 December, 2018 2 February, 2019
Dr. Annam Pavan Kumar	Application of genomics in fisheries and aquaculture	Sathyabama Institute of Science and Technology, Chennai, Tamil Nadu	21 June, 2018
Dr. Sunil Kumar Nayak	<i>Matsya Palan Taknik ki Jankari</i>	Agriculture Training Centre, Powarkheda, Hoshangabad, MP	1 June, 2018 22 June, 2018 29 June, 2018 9 October, 2018 21 December, 2018 22 February, 2019 19 March, 2019
Dr. N. P. Sahu	Deoiled ricebran in sustaining aquaculture production: More of it or more from it	Mymensingh, Bangladesh Agricultural University	5-6 July, 2018
Dr. Annam Pavan Kumar	DNA barcoding: Tool for fish biodiversity characterization and conservation	College of Fisheries Science, Assam Agricultural University, Raha, Assam	9 July, 2018
Dr. K. K. Krishnani	Upcoming challenges and future prospects in agricultural sciences with special reference to fisheries	2 nd Annual Symposium for Educators-Confluence of Minds at GTA Vidya Mandir, Chennai, Tamil Nadu	21 July, 2018
Dr. Parimal Sardar	Scope of cottonseed meal as aqua-feed ingredient	ICAR-Central Institute for Research on Cotton Technology, Matunga, Mumbai, Maharashtra	28 July, 2018
Dr. K. K. Krishnani	Environmentally viable nano (molecular) technologies for application in fisheries	ICAR-Central Inland Fisheries Research Institute, Barrackpore, West Bengal	1 August, 2018
Dr. K. K. Krishnani	Improving livelihood of farmers through integrated agri-aquaculture	ICAR- Central Inland Fisheries Research Institute, Barrackpore, West Bengal	3 August, 2018
Mr. Satya Prakash	Pacific white shrimp (<i>L. vannamei</i>) culture	Aquaculture Research and Training Institute, Hisar, Haryana	20 August, 2018
Dr. K. K. Krishnani	Improving livelihood of farmers through improved technology interventions in fisheries	Commissionerate of Animal Husbandry, Pune, Maharashtra	2 September, 2018
Dr. Aparna Chaudhari	Molecular approaches for disease prevention and control	National Seminar on "Recent Trends in Biotechnology" Pillai College of Arts Commerce and Science, New Mumbai	8 September, 2018
Dr. S. Jahageerdar	Genetics and SPF status of <i>P. vannamei</i> / <i>P. monodon</i> brood stocking in India	Coastal Aquaculture Authority, Chennai	11 September, 2018

Dr. Paramita Banerjee Sawant	Best from waste: Cleanliness and hygiene at fish landing centers	Versova Welfare Association High School, Mumbai, Maharashtra	22 September, 2018
Ms. Madhuri S. Pathak	Inland saline aquaculture	Nanded Education Society, Science college, Nanded, Maharashtra	25 September, 2018
Dr. Manjusha L.	Hygienic handling of seafood	Versova Welfare Association High School, Mumbai, Maharashtra	29 September, 2018
Dr. Arpita Sharma	Mainstreaming Gender in Fisheries Education	Global Conference on 'Gender in Aquaculture and Fisheries-GAF 7' at Asian Institute of Technology, (AIT), Bangkok, Thailand	19 October, 2018
Dr. A. K. Verma	Optimization of fish (<i>Labeo rohita</i>) and plant ration under aquaponics	Shepherd Institute of Engineering and Technology, Allahabad, Uttar Pradesh	17 November, 2018
Dr. Parimal Sardar	Nutrition of ornamental fish: Existing and emerging concerns	Bihar Animal Science University, Patna	20 November, 2018
Dr. Sikendra Kumar	Aquaculture: A source of high income generation and future food	In Aqua-Poultry-Dairy Expo, 2018, ICAR-NBFGR, Lucknow	13 December, 2018
Dr. Vidya Shree Bharti	Soil and water quality management of aquatic system	Don Bosco Institute of Technology, Kurla, Mumbai, Maharashtra	11 January, 2019
Dr. Rajendran K. V.	Transboundary and emerging diseases in aquaculture	31 st All India Congress of Zoology and National Seminar on "Climate Smart Aquaculture and Fisheries", CAU-College of Fisheries, Lembucherra, Tripura	15 January, 2019
Dr. Aparna Chaudhari	Transcriptomes of <i>Clarias magur</i> brain and gonads reveal insights into male behaviour during induced breeding	International Conference on "Challenges and Opportunities for Sustainable Fisheries and Aquaculture Development", College of Fisheries Ratnagiri, Maharashtra	17 January, 2019
Dr. N. P. Sahu	Looking forward aquaculture nutrition research by 2030 for sustainable aquaculture	International Conference on "Challenges and Opportunities for Sustainable Fisheries and Aquaculture Development", College of Fisheries Ratnagiri, Maharashtra	18 January, 2019
Dr. Rajendran K. V.	Current status of shrimp disease diagnosis vis-à-vis reporting in India-Gaps, constraints and way forward	Workshop on 'Need for Uniform Policy on Fish Disease Diagnosis and Quarantine' NAAS, New Delhi	29 January, 2019
Dr. Pankaj Kumar	Ornamental fish trade, prospect scope and opportunity in Haryana	State Department of Fisheries, Government Fish Seed Farm, Saidpur, Karnal, Haryana	31 January, 2019
Mr. Ashok Kumar	Breeding technology of egg laying and live bearer fishes	State Department of Fisheries, Government Fish Seed Farm, Saidpur, Karnal, Haryana	31 January, 2019

Dr. K. Sreedharan	Diseases in ornamental fishes	State Department of Fisheries, Government Fish Seed Farm, Saidpur, Karnal, Haryana	13 February, 2019
Dr. Pankaj Kumar	Fish business in peri-urban: An untapped potential	4 th Agri Leadership Summit, Sonapat, Haryana	16 February, 2019
Dr. K. Sreedharan	Increasing demand of value added fish products	4 th Agri Leadership Summit, Sonapat, Haryana	16 February, 2019
Mr. Ashok Kumar	White Shrimp Production – A major diversified economic activity	4 th Agri Leadership Summit, Sonapat, Haryana	16 February, 2019
Dr. Rajendran K. V.	Parasitism and ecosystem functioning	National Seminar on “Recent Trends in Parasitology’ Research” Department of Zoology, Kannur University, Kerala	22 February, 2019
Dr. Rajendran K. V.	Health management in aquaculture with special reference to parasitic diseases	Aqua Clinics & Aquapreneurship Development Programme, National Centre for Aquatic Animal Health, Cochin University of Science and Technology, Kochi, Kerala	25 February, 2019
Dr. Sunil Kumar Nayak	Magur breeding and culture of fresh water prawn	College of Fisheries, Jabalpur, Madhya Pradesh	25 March, 2019

4.7 Guest Faculty Invited from Other Institutions

Name of the faculty	Affiliation	Title of the lecture	Date
Dr. N. R. Kumar	Principal Scientist, ICAR-National Institute of Agricultural Economics and Policy Research, New Delhi	International Trade	3 November, 2018
Dr. Anjana Ekka	Scientist, ICAR- Central Inland Fisheries Research Institute, Barrackpore, West Bengal	Research Methodology	7 February, 2019
Dr. A. K. Pal	Former Joint Director, ICAR- Central Institute of Fisheries Education, Mumbai	Current status of aquaculture and potential of input based culture in India	26 February, 2019
Dr. S. N. Biswas	Former Joint Director, Department of Fisheries West Bengal	Prospect of entrepreneurship in fisheries and aquaculture in West Bengal	26 February, 2019
Dr. P. K. Mukhopadhyay	Former Head, ICAR- Central Institute of Freshwater Aquaculture, Bhubaneswar	Status of feed based aquaculture in India	27 February, 2019
Dr. L. Kosygin Singh	Scientist-D, Zoological Survey of India, Kolkata, West Bengal	Freshwater fishes of India with reference to their diversity and conservation	1 March, 2019
Dr. T. J. Abraham	Professor, West Bengal University of Animal and Fishery Sciences, Kolkata, West Bengal	Fish health management: Bacterial disease and their control	2 March, 2019

Dr. B. N. Paul	Principal Scientist, ICAR- Central Institute of Freshwater Aquaculture, Bhubaneswar, Odisha	Fish as food for human health	2 March, 2019
Dr. S. Basanta Singh	Director (I), Central Agricultural University, Imphal	Economic viability of Agro enterprises: A case study	4 March, 2019
Mr. Bidhan Das	Deputy Director Branch Head, Indian Institute of Packaging, Kolkata	Packaging of fish and fish products	6 March, 2019
Dr. A. K. Das	Principal Scientist ICAR- Central Inland Fisheries Research Institute, Barrackpore, West Bengal	Cage culture technology	6 March, 2019
Dr. Prasanta Chatterjee	Research Coordinator, Krishi Vigyan Kendra, Nimpith, West Bengal	Diversification of freshwater fish culture	8 March, 2019
Mr. Shibashish Das	Branch Head/Manager, Industrial Development Bank of India, Barasat, West Bengal	Development of viable project proposals	9 March, 2019
Dr. Swagat Ghosh	Ramakrishna Mission Vivekananda Educational & Research Institute, Kolkata, West Bengal	Breeding, culture & trading of marine ornamental fish	9 March, 2019
Mr. Indranil Ghosh	Subject Matter Specialist, Krishi Vigyan Kendra, Jalpaiguri, West Bengal University of Animal and Fishery Sciences, Kolkata	Ornamental fisheries development in West Bengal	11 March, 2019
Mr. Avijit Kumar Koley	Farmer/Entrepreneur, Kolkata, West Bengal	Breeding & culture of monosex tilapia	11 March, 2019
Shri U. S. Tomar	Former Joint Director, State Fisheries Department, Govt. of MP	Recent advances in aquaculture	11 March, 2019
Dr. Prem Kumar	Scientist, ICAR- Central Institute of Brackishwater Aquaculture, Kakdwip, West Bengal	Breeding techniques & culture strategies of brackishwater candidate species	12 March, 2019
Ms. Christina L.	Scientist, ICAR- Central Institute of Brackishwater Aquaculture, Kakdwip, West Bengal	Prospect of mud crab culture	12 March, 2019
Mr. Milon Sinha	Entrepreneur, Kolkata	Breeding and seed production of Magur	12 March, 2019
Shri. Anil Saxena	Entrepreneur/Progressive Farmer, Kolkata	Introduction to recirculatory aquaculture system	12 March, 2019
Dr. S. Chowdhury	Assistant Professor West Bengal University of Animal and Fishery Sciences, Kolkata, West Bengal	Recent advances in fish processing technology	13 March, 2019
Dr. Gadadhar Dash	Professor, West Bengal University of Animal and Fishery Sciences, Kolkata	Parasitic diseases of fish & their control	13 March, 2019

Shri O. P. Saxena	Director, State Fisheries Department, Govt. Of MP	Freshwater fish culture	13 March, 2019
Dr. S. Adhikari	Principal Scientist and Head, ICAR-Central Institute of Freshwater Aquaculture, Rahara, Odisha	Environmental impact assessment (EIA)	14 March, 2019
Dr. Arabinda Das	Scientist, ICAR- Central Institute of Freshwater Aquaculture, Kalyani, Bhubaneswar, Odisha	Breeding and seed production of indigenous catfishes of India	15 March, 2019
Dr. N. A. Talwar	Professor West Bengal University of Animal and Fishery Sciences, Kolkata, West Bengal	Pond construction and management	15 March, 2019
Dr. J. K. Sundaray	Principal Scientist and Head, ICAR- Central Institute of Freshwater Aquaculture, Bhubaneswar, Odisha	Entrepreneurship avenues in aquaculture biotechnology	15 March, 2019
Prof. T. S. Nagesh	Professor, West Bengal University of Animal and Fishery Sciences, Kolkata	Various schemes of government agencies for fisheries development	16 March, 2019
Mr. Gangesh K. Varma	Director, Varma Ocean Product (P) Ltd, Kolkata	Entrepreneurship opportunities in fisheries and aquaculture	19 March, 2019
Mr. Anirban Chanda	Urbagrow, Kolkata, West Bengal	Aquaponics and recirculatory systems	19 March, 2019
Mrs. Subhalaxmi Das Banerjee	Project Former Coordinator, Marine Products Exports Development Authority, Cochin, Kerala	Trade of ornamental fish	19 March, 2019
Dr. Koushik Ghosh	Associate Professor, University of Burdwan, West Bengal	Use of probiotics in aquaculture	20 March, 2019
Mr. Archiman Lahiri	Deputy Director, Marine Products Exports Development Authority, Kolkata, West Bengal	Role of MPEDA in aquapreneurship development	20 March, 2019
Mr. Atanu Ray	State Coordinator, NETFISH, Marine Products Exports Development Authority Kolkata, West Bengal	Fish quality management & sustainable fishing	20 March, 2019
Dr. Sanjoy Das	Principal Scientist, ICAR- Central Institute of Brackishwater Aquaculture, Kakdwip, West Bengal	Modern diagnostic tool for monitoring of health of finfish & shellfish	23 March, 2019
Dr. T. K. Ghosal	Principal Scientist & Head, ICAR- Central Institute of Brackishwater Aquaculture, Kakadwip, West Bengal	Feed & feeding strategies of brackishwater aquaculture	24 March, 2019
Prof. S. S. Dana	Registrar, West Bengal University of Animal and Fishery Sciences, Kolkata, West Bengal	Project management tools and techniques in fisheries	25 March, 2019

4.8 Faculty Invited from Foreign University

Name of the faculty	Affiliation	Title of lecture	Date
Dr. S. J. Kaushik	European Research Area Chair, Eco Aqua- ULP GC-Las Palmas, Aquitaine, France	Resource utilisation efficiency: A key factor for sustainable aquaculture development	15 January, 2019
Dr. Keith Criddle	Professor, College of Fisheries and Ocean Sciences, University of Alaska, USA	Alaskan Fisheries	21 January, 2019
Dr. Amararatne Yakupitiyage	Adjunct Faculty, Asian Institute of Technology, Thailand	Energy efficient & innovative feed technology for sustainable aquaculture	21 January, 2019
Dr. Sootawat Benjakul	Professor, Prince of Songkla University, Thailand	Innovative and eco-friendly approaches in post-harvest management of fish	21 January, 2019

4.9 Student Achievements

Students placement

Central Government/organization

Mr. Manickwasagam	Scientist-B, INCOIS, Hyderabad r
Mr. Parmanand P.	Technical Officer (T3) ICAR-CIFT, Veraval r
Mr. Ranjan Singh	Technical officer (T3)ICAR-CIFT, Veraval r
Ms. Gita S.	Farm Assistant, Central Agriculture University, Tripura r
Mr. Dipin K.M.	Executive Assistant Technical Officer, NFDB, Hyderabad r

Krishi Vigyan Kendra

Mr. Joshi Kumar	Subject Matter Specialist (Fisheries), KVK, Manipur r
Mr. Hoilenting	Subject Matter Specialist (Fisheries), KVK, Senapati, Manipur r
Ms. Thongam Monika Devi	Subject Matter Specialist (Fisheries), KVK, Central Agricultural University, Imphal, South Garo Hills. Meghalaya r
Ms. Shoba Rawat	Subject Matter Specialist (Fisheries), KVK, Dr. Rajendra Prasad Central Agriculture University, Pusa, Bihar r

Assistant Professor in CAUs/SAUs

Dr. Amitava Ghosh	Central Agriculture University, Lembucherra, Tripura r
Mr. Imtiaz Ahmed	AAU-College of Fishery, Raha, Assam r
Mr. Roshan Kumar Ram	Dr. Rajendra Prasad Central Agriculture University, COF, Dholi, Bihar
Dr. Ishfaq Nazir	Birsa Agriculture University, COF, Ranchi, Jharkhand r
Mr. Irshad Ahmed	Birsa Agriculture University, COF, Ranchi, Jharkhand r
Mr. Om Pravesh	Birsa Agriculture University, COF, Ranchi, Jharkhand r
Mr. Bharatendu Vimal	Birsa Agriculture University, COF, Ranchi, Jharkhand r
Ms. Shweta Kumari	Birsa Agriculture University, COF, Ranchi, Jharkhand r

Dr. Amit Ranjan	College of Fisheries, Kishanganj, Bihar r
Mr. Ravi Shankar Kumar	College of Fisheries, Kishanganj, Bihar r
Mr. D. Kranthi	College of Fisheries, Pebbair, Andhra Pradesh r
Mr. Somu Sundar Lingam	Tamil Nadu Dr. J. Jayalalitha Fisheries University, Nagapattinum, Tamil Nadu r
Ms. Navghan Mahida	College of Agricultural Sciences, Baroda r

Teaching Assistant

Mr. Bhushan Sanap	College of Fisheries, Kawardha, Chattisgarh r
Ms. Chellamanimegalai P.	Fisheries College & Research Institute, Thoothukudi, Tamil Nadu r
Mr. Abhijit Mallik	College of Fisheries, Kawardha, Chattisgarh r

Nationalised Banks

Ms. Bullo Ankha	Probationary Officer, Canara Bank, Maharashtra
Ms. Sherin B. N.	Assistant Manager, State Bank of India, Chennai r

State Department

Assistant Director of Fisheries

Mr. Nitesh Gurung	Department of Fisheries, Assam r
Mr. Benson	Department of Fisheries, Kerala r
Mr. Nitesh Gurung	Directorate of Fisheries, Govt. of Sikkim, Gangtok r
Mr. Vivek R.	Department of Fisheries, Karnataka r

Fisheries Development Officer

Mr. Diganta Chetia	Department of Fisheries, Assam r
Mr. Jahanoor Ikram	Department of Fisheries, Assam r
Mr. Deepjyoti Bohra	Department of Fisheries, Assam r
Ms. Barkha Rani Chetia	Department of Fisheries, Assam r
Ms. Neriyaang Jamoh	Department of Fisheries, Arunachal Pradesh

Assistant Fisheries Development Officer

Mr. Sachin S. M.	Department of Fisheries, Karnataka
Mr. Adarsh K.	Department of Fisheries, Karnataka
Mr. Nadeesha	Department of Fisheries, Karnataka

Fisheries Extension Officer

Ms. Madhusmita Kalita	Department of Fisheries, Assam
Mr. Aditya Barua	Department of Fisheries, Assam
Mr. Himanshu Bhattacharya	Directorate of Fisheries, Assam
Ms. Narinder Kaur	Department of Fisheries, Punjab
Mr. Srijit Chakravarty	Department of Fisheries, West Bengal

Fisheries Inspector

Ms. Shweta Meshram	Department of Fisheries, Chhattisgarh
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Research Associate

Dr. Showkat Dar	ICAR-CIFE, Mumbai
Dr. Aditya Acharya	ICAR-CIFE, Mumbai
Ms. Sushila N.	ICAR-CIFE, Mumbai

Senior Research Fellow

Ms. Sethu Laksmi	ICAR-CIFT, Cochin
Ms. Tenji Bhutia	ICAR-CIFE, Mumbai
Mr. Mohammad Mehroof	ICAR-CIFE, Mumbai
Ms. S. Dona	ICAR-CIFE, Mumbai
Ms. Vandita	ICAR-CIFE, Mumbai

Overseas (Ph.D. Scholar)

Mr. Sivagurunathan U.	Aquaculture Research Group, University of Las Palmas de Gran Canaria (ULPGC), Spain
Mr. Rahul Krishnan	Department of Aqualife Medicine, Chonnam National University, South Korea
Mr. Shyam K	Department of Aqualife Medicine, Chonnam National University, South Korea

Others

Ms. Bhumika Arora	Faculty in Private Tutorial, Punjab
Mr. Kabin Medhi	YP2-CIFRI Young Professional, ICAR-CIFRI, Barrackpore, West Bengal

4.10 Papers Presented by Students in National/International Seminars/Conferences/Symposia etc.

National

National Conference on “Marine Debris CoMaD”, ICAR-CMFRI, Kochi, 11-12 April, 2018

Mr. Abuthagir Ibrahlim	Dolnet –an ingenious fishing gear or a debris collector?
Ms. Aswathy Ashokan	Assessment of marine litter on recreational beaches along Mumbai coast
Ms. Aswathy Ashokan	Marine litter mapping along Mumbai coast, Maharashtra

National Seminar on “Integrated Farming System for Enhancing Farmer's Income and Nutritional Security” held at West Bengal University of Animal & Fishery Sciences (WBUAFS), Belgachia, Kolkata -700037, West Bengal, 5-7 December, 2018

Mr. Suman Dey	Fish Food Security Index – A measurement of fish food security across the Indian states
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59th Annual Conference of The Association of Microbiologists (AMI), University of Hyderabad, 9-12 December, 2018

Mr. Sambit Kishore	Occurrence of <i>Cronobacter</i> spp. in fish and shellfish from Mumbai, India
Ms. Pooja Saklani	Survival dynamics of methicillin resistant <i>Staphylococcus aureus</i> in fish
Ms. Barkha R. Chetia	Isolation of <i>Arcobacter butzleri</i> bacteriophage from fish

31st All India Congress of Zoology & National Seminar on “Climate-Smart Aquaculture and Fisheries”, at CAU-College of Fisheries, Lembucherra, Tripura, 15-16 January, 2019

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|-------------------------|--|
| Ms. Bahni Dhar | Changes in fatty acid profile, texture and colour of <i>Pangasianodon hypophthalmus</i> during salt fermentation |
| Ms. B. Priyadarshini | Protein interaction studies of cluster bean isolate and tilapia surimi in enhancement of gel forming ability: A calorimetric and FTIR analysis |
| Ms. Sushree R. Senapati | Spreading pattern of melanosis in White-leg Shrimp (<i>L. vannamei</i>) based on polyphenol oxidase activity during chilled storage |

World Brackishwater Aquaculture Conference-2019, at ICAR-CIBA, Chennai, 23-25 January, 2019

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| Ms. Pushpa Kumari | Antiparasitic efficacy of organic and aqueous extracts of Neem (<i>Azadirachta indica</i>) leaf against <i>Argulus japonicus</i> in goldfish (<i>Carassius auratus</i>) r |
| Ms. Sanchita Naskar | Effect of salinity variations and addition of humic acid for controlling GHG emission from different aquaculture system r |
| Ms. Vandana V. R. | A New Myxozoan Parasite, <i>Ellipsomyxa boleophthalmi</i> sp. nov. infecting gall Bladder of Brackishwater Fish, Mudskipper, <i>Boleophthalmus dussumieri</i> (Valenciennes, 1837) r |
| Mr. S. Prusty | Occupational health injuries faced by shrimp farm workers r |

National Conference on “Rejuvenating Cooperatives for Doubling Farmers' Income: A Road Map” at Kerala Agricultural University, Thrissur, 1-2 February, 2019

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|-------------------|--|
| Mr. Abhinandan K. | Gender Analysis: Key to rejuvenate fisheries cooperatives for doubling fishers' income r |
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14th Agricultural Science Congress on “Knowledge and Innovation Drivers for Growth of Aquaculture”, National Agricultural Science Centre Complex, New Delhi, 20-23 February, 2019

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| Ms. Bharathi R | Identification and characterization of opportunistic bacteria isolated from cage cultured <i>Pangasianodon hypophthalmus</i> r |
| Ms. Sushila N | Characterization and expression profile of RAG-2 and IgM genes during developmental stages of Angelfish (<i>Pterophyllum scalare</i>) r |

International

3rd International Symposium on “Aquaculture and Fisheries Education for Sustainable Blue Economy” ICAR-Central Institute of Fisheries Education, Mumbai (ISAFE3), 16-18 May, 2018

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| Mr. Chinmay Nanda | Organic aquaculture: A pathway towards sustainability and need in fisheries education r |
| Mr. Hussain N | Attracting talented young students in fisheries sector r |
| Mr. S. S. Lingam | Sustainability in aquaculture: A quest for advising and educating future aquaculturists r |





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| Mr. S. S. Lingam | Effect of prolonged stunting on growth and carcass quality of milkfish, <i>Chanos chanos</i> reared under pond conditions: Educating farmers' towards an alternative enterprise development and diversification |
| Ms. Aswathy Ashokan | Mapping and assessment of marine litter through GIS |
| Mr. Santhana Kumar | Field expertise learning program (FELP) |
| Mr. Vivek R | Effects of sugarcane bagasse substrate on periphyton production and growth performance of <i>Labeo rohita</i> |
| Mr. Atul Patil N | Attracting and retaining youth through micro entrepreneurship development via integrated agribusiness model in Maharashtra: A way forward |
| Mr. D. Ratre | Addressing the need of professional knowledge in fisheries social science for sustainable development |
| Mr. Hoilenting | Changing climate and its impact on fisheries sector in Assam, North East India |

International Seminar on “Rice Bran as Animal Feed” Mymensingh, Bangladesh Agriculture University, Bangladesh, 5-6 July, 2018

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|--------------------|---|
| Mr. Prasanta Jana | Dietary intervention for gonadal inhibition and complementary growth enhancement in <i>Labeo rohita</i> (Hamilton, 1822). r |
| Mr. Mritunjoy Paul | De-oiled rice bran in fish feed r |

Biennial Conference of the International Institute of Fisheries Economics and Trade (IIFET), Adapting to a Changing World: Challenges and Opportunities, University of Washington, Seattle, United States of America, 16-20 July , 2018

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| Mr. Bharat Yadav | Mapping activity, access and control profile in small scale ornamental fish production units in Maharashtra, India using Harvard analysis framework r |
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Global Conference on “Gender in Aquaculture and Fisheries-GAF 7” held at Asian Institute of Technology, (AIT), Bangkok, Thailand, 18-20 October, 2018

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| Mr. R. Rathod | Locating the context of gender in fisheries policies of India |
| Ms. Pooja Gautam | Human development of small scale fishers in Indian reservoirs: A gender based assessment r |
| Ms. Siddhika Meher | Can small scale fisherwomen take to online retail? Evidence from a social experiment with Mumbai fisherwomen r |
| Mr. Sandesh Patil | Shrimp industry gender gap in India: Case of Maharashtra State r |
| Mr. Abuthagir Ibrahim | Gender roles in bagnet creek fishery in North-West coast of India r |



International Symposium on “Technological Innovations in Muscle Food Processing for Nutritional Security, Quality and Safety”, West Bengal University of Animal & Fishery Sciences, Kolkata, 22-24 November, 2018

Ms. Bahni Dhar In process changes in biochemical characteristics associated with salt fermented pangas (*Pangasianodon hypophthalmus*) r

International Conference on “Challenges and Opportunities for Sustainable Fisheries and Aquaculture Development (COSFAD 2019)”, College of Fisheries, Shirgaon, Ratnagiri, 17-21 January, 2019

Mr. Showkat A. Dar Effect of growth modulators on hunger and growth related genes in *Labeo rohita* (Hamilton, 1822)

Mr. Subal Kumar Ghosh Detection of enteric adenoviruses from seafood in Mumbai

Mr. Vignesh D. Utilisation of *Acetes* protein hydrolysate residue for chitin extraction

Mr. Mohammed Akram J. Nutritional quality of differently reared *Litopenaeus vannamei*

Mr. Ramakrishna Reddy Effect of gamma irradiation on histamine formers

Ms. Kasturi Chattopadhyay Chitosan additions in fish mince emulsion batter effect on quality parameters of sausages under refrigerated storage (3°C) r

Ms. Lekshmi S. Screening of seaweeds for incorporation into food system r

Mr. Affarin Tinku Development of coated products from inland saline water shrimp (*Litopenaeus vannamei*) and its storage study r

Mr. S. B. Gore Suitability of Indian major carps for preparation of minced sausages r

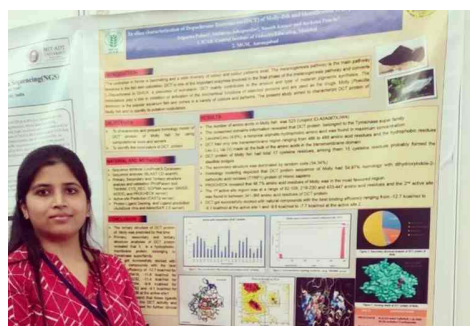
Mr. Tapas Paul Effect of temperature and pH on stability and acute toxicity of triclosan in *Pangasianodon hypophthalmus* r



- Mr. Sandeep S. Pattanaik Dietary caroteno-protein incorporated novel feed formulation from shrimp shell waste improves growth, antioxidant activity and coloration in the high value ornamental fish, Oscar, *Astronotus ocellatus*
- Ms. Sangavi, S Dietary incorporation of oil palm kernel meal as a practical and a cost-effective feed ingredient for improved growth and physio-metabolic responses of rohu, *Labeo rohita* (Hamilton, 1822) fingerlings
- Mr. Somu Sunder Lingam Effect of duration of stunting on carcass quality of milk fish, *Chanos chanos*: An alternative option to improve meat quality for better milk fish culture
- Ms. Riya Kumari Identification of natural compound as putative modulators for the zebrafish tyrosinase protein using structure based virtual screening approach.
- Mr. Manabesh Mahapatra Identification of novel protein coding genes from *Clarias magur* transcriptome.

International Conference on Recent Trends in Bioengineering at MIT School of Bioengineering Sciences & Research on 16th Feb 2019 at Pune.

- Ms. Triparna Pahari Presented a poster r



4.11. Student Exchange program (JENESYS)

Ms. Jerusha S., PHT/2015-18 visited to Japan under 'Japan-East Asia Network of Exchange for Students and Youths (JENESYS) 2018 for SAARC countries' Japan during 10-18 December, 2018. r

4.12 Awards Received by Students

National Awards

Name of Student	Name of the Award/Event/Organization	Date
Mr. Gaind Singh	Nobel Masters of Fisheries Award-2018: International Journal for Research under Literal Access Accredited by Idamas Learning Center, Malaysia	15 August, 2018
Mr. Chinmaya Nanda	Best Short Video; National Conference on "Marine Debris (CoMaD) 2018" at ICAR-Central Marine Fisheries Research Institute and MBAI, Cochin	12 April, 2018

Mr. Kesavan	Best Short Video; National Conference on “Marine Debris (CoMaD) 2018” at ICAR-Central Marine Fisheries Research Institute and MBI, Cochin	02 April, 2018
Ms. Abhilipsa Biswal	Best Poster Presentation Award; 3 rd International Symposium on “Aquaculture and Fisheries Education (ISAFE3)”, ICAR-Central Institute of Fisheries Education, Mumbai	18 May, 2018
Mr. Krishna Pada Singha	2 nd Prize in Poster Presentation; 3 rd International Symposium on “Aquaculture and Fisheries Education (ISAFE3)”, ICAR-Central Institute of Fisheries Education, Mumbai	18 May, 2018
Mr. Santhana Kumar	2 nd Prize in Oral Presentation Award ; 3 rd International Symposium on “Aquaculture and Fisheries Education (ISAFE3)”, ICAR-Central Institute of Fisheries Education, Mumbai	18 May, 2018
Ms. Nuzaiya P. Muhammed	3 rd Prize in Poster Presentation; 3 rd International Symposium on “Aquaculture and Fisheries Education (ISAFE3)”, ICAR-Central Institute of Fisheries Education, Mumbai	18 May, 2018
Mr. Sutanu Karmakar	3 rd Prize in Oral Presentation; 3 rd International Symposium on “Aquaculture and Fisheries Education (ISAFE3)”, ICAR-Central Institute of Fisheries Education, Mumbai	18 May, 2018
Ms. Tenji Pem Bhutia	4 th Prize in Oral Presentation; 3 rd International Symposium on “Aquaculture and Fisheries Education (ISAFE3)”, ICAR-Central Institute of Fisheries Education, Mumbai	18 May, 2018
Ms. Sajina K A	5 th Prize in Oral Presentation; 3 rd International Symposium on “Aquaculture and Fisheries Education (ISAFE3)”, ICAR-Central Institute of Fisheries Education, Mumbai	18 May, 2018
Mr. Rahul Krishnan	Best M.F.Sc Dissertation Award-2018; Annual Day at ICAR-Central Institute of Fisheries Education, Mumbai	06 June, 2018
Mr. Tapas Paul	Best Fisheries Video; Interview Society of Fisheries and Life Sciences, College of Fisheries Mangalore, Karnataka	25 October, 2018
Mr. Mukesh K. Bairwa	Best Scientific Paper Award; Society of Fisheries Technologists (India)	08 November, 2018
Ms. Bahni Dhar	Second Place in Oral Presentation; International Symposium on “Technological Innovations in Muscle Food Processing for Nutritional Security, Quality and Safety”, WBUAFS, Kolkata	24 November, 2018
Mr. Suman Dey	Best Oral Presentation Award; National Seminar on “Integrated Farming System for Enhancing Farmer's Income and Nutritional Security” West Bengal University of Animal & Fishery Sciences, Belgachia, Kolkata	07 December, 2018

Mr. Sudarshan S	Best Photography – Anthropocene Concept; WWF-India, Mangrove Foundation of Maharashtra and Marine Life of Mumbai	12 January, 2019 r
Ms. Bhargavi Priyadarshini	Best Oral Presentation; Award 31 st All India Congress of Zoology & National Seminar on “Climate-Smart Aquaculture and Fisheries”, College of Fisheries, Lembucherra, Tripura r	16 January, 2019 r
Mr. Tapas Paul	Best Poster Award; International Conference on “Challenges and Opportunities for Sustainable Fisheries and Aquaculture Development” (COSFAD 2019), College of Fisheries, Ratnagiri r	20 January, 2019 r
Mr. Manabesh Mahapatra	Best Oral Presentation; Award International Conference on “Challenges and Opportunities for Sustainable Fisheries and Aquaculture Development” (COSFAD 2019), College of Fisheries, Ratnagiri r	20 January, 2019 r
Ms. Vandana V. R	Best Poster Award; World Brackishwater Aquaculture Conference (BRAQCON), Chennai	25 January, 2019 r
Mr. Somu S. Lingam	Best Oral Presentation Award; World Brackishwater Aquaculture Conference BRAQCON, Chennai r	25 January, 2019 r
Mr. Sutanu Karmakar	AIASA Young Scientist Award; 84 th National Youth Convention, JNKVV, Jabalpur, MP	16 February, 2019 r
Mr. Tapas Paul	AIASA National Gold Medal; 4 th National Youth Convention JNKVV, Jabalpur, MP r	16 February, 2019 r
Mr. Suman Dey	Best Participant Award; “Communicating Science” at ICAR- Central Institute of Fisheries Education, Mumbai r	20 March, 2019
Ms. Sangavi S	Best Paper Award; 3 rd Student Convention on “Next generation aquaculture: Panacea to employment challenges”, ICAR- Central Institute of Fisheries Education, Mumbai r	26 March, 2019 r

4.13. Awards Received by Students

Event : All India Fisheries College Cultural and Sports Meet

Venue : College of Fisheries, Mangalore

Date : 14-15 December, 2018

S.No.	Name of the student	Event	Position
1.	Mr. Jeevan T. M.	Badminton singles	Gold Medal r
2.	Mr. Prathik & Mr. Jeevan	Badminton doubles	Gold Medal r
3.	Mr. Shiva Kumar	Table tennis	Gold Medal r
4.	Ms. Gopika Radhakrishnan	English debate	Gold Medal r
5.	Mr. Avinash Gaikwad & Mr. Chanikya Naidu	Quiz	Gold Medal r
6.	Ms. Sona B. R.	Chess	Gold Medal r
7.	Mr. Jeevan T. M.	Swimming	Bronze Medal r

Participation

XIX All India Inter-Agri-University Sports and Games Meet at Punjab Agricultural University, Ludhiana, Punjab (2nd-5th January, 2019)

Students of ICAR-CIFE participated in the XIX All India-Inter-Agri University Sports and Game Meet at Punjab Agricultural University, Ludhiana, Punjab.



4.14 Training Attended

Student Name	Details of Training Programme and Venue	Period
Mr. Manabesh Mahapatra	Species Diversification in Freshwater Aquaculture for Enhancing Productivity, ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar, Odisha	06-10 August, 2018
Mr. Raju Ram	Bioinformatics Analysis of NGS Data, ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar, Odisha	03-09 October, 2018
Mr. Chandan Haldar	Bioinformatics Analysis of NGS Data, ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar, Odisha	03-09 October, 2018
Mr. Utsa Roy	Fish Cell Culture Techniques: Development and Applications, Aquatic Animal Health Laboratory, Tamil Nadu	12-17 November, 2018
Ms. Narinder Kaur	Fish Cell Culture Techniques: Development and Applications, Aquatic Animal Health Laboratory, Tamil Nadu	12-17 November, 2018
Mr. Ubaid Qayoom	Fish Cell Culture Techniques: Development and Applications, Aquatic Animal Health Laboratory, Tamil Nadu	12-17 November, 2018





Research Achievements



INSTITUTIONAL PROJECTS

Highlights

- Leafmeals from selected plants can completely replace de-oiled rice bran (DORB) in fish feeds.
- 56 first generation families of *Clarias magur* from genetically selected individuals
- The Center for Zebrafish Breeding and Genetic Research at CIFE has pedigreed zebrafish available for researchers in India
- CIFE-Eco Hatchery, a zero water exchange model developed in the institute
- Plastics are the most abundant marine debris found in fishing hauls off Mumbai coast
- Distribution of *Hemiramphus pelagicus* off west coast of India being reported for the first time
- A chemical-free water filtration-treatment unit by CIFE can remove chemical contaminants and microbes



Development of comprehensive package of practices of inland saline water aquaculture

2017-2020 r

Program leader: Gopal Krishna r

Mapping and characterization of soil and water quality parameters of on-going and potential sites and their correction with different production systems

Kiran Dube Rawat, N. K. Chadha, Paramita B. Sawant, Babitha Rani, Madhuri Pathak, Narendra Aglave, Ashok Kumar r

Twenty farmers from 10 districts of Haryana were selected who had undertaken shrimp farming in inland saline water. r

Soil and water samples were collected from 20 inland saline water farms from 10 districts and were analysed for the physicochemical parameters in order to assess their suitability for aquaculture. The results suggested that water quality parameters such as turbidity, COD etc. in farm no.5 (Dhariwal) was found to be comparatively higher than the others.

The highest production was recorded in farm no.11 at Shirsia and it could be correlated with the high available potassium

and calcium content of 229 ppm and 3314 ppm respectively, in the soil and also the corresponding salinity of 20 ppt. r

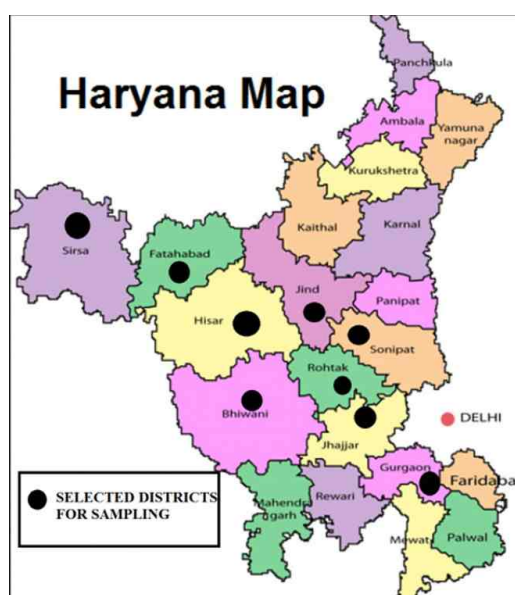
Among the ponds that had been harvested, the lowest production was seen in farm no.7 which was found to be of lower salinity (3 ppt). This farm also exhibited lower available calcium and potassium levels in the soil. r

Zero water exchange model for carp seed production

2016-2019

Ajit Kumar Verma, V. K. Tiwari, Babitha Rani, Kundan Kumar, Sunil Kumar Nayak r

The design of filter and biofilter was made using geotextile cloth, fine sand, coarse sand, gravel, and plastic bio-balls. The integrated column filter model was constructed and tested. Production of carp spawn upto 2.5 Lakh/ cycle can be achieved



Map showing locations of sampling r



Aquaponics set for the production of carp seed and spinach r

using *CIFE-Eco hatchery* with integrated filter in RAS with an optimum flow rate of 20 L/ min. The quantity of water required for production of 1000 spawn using *CIFE-Eco Hatchery* with Integrated RAS was 21.65 L.

An aquaponic system with 12 separate sets was designed and used for conducting experiments to optimize fish and plant component ratio for production of carp seed. Based on the experimental results, a component ratio of 6:1 (Rohu fry: Lemon grass) could be recommended for culture in aquaponics. The highest plant (Lemon grass) growth rate in terms of length and weight was 78.59 ± 0.32 cm and 19.94 ± 0.10 g, respectively. An optimal fish to plant component ratio (40 spawn:14 spinach plants) could be recommended for production of carp seed (fry) using this system. Also, an optimal fish to plant component ratio of 20 fry:14 spinach plants could be recommended for production of carp seed (fingerling). Overall, 1000 fingerlings and 35.50 kg of spinach could be produced by using 10,000 litre of water in aquaponics system developed under this study.

Performance evaluation and improvement of newly-designed water filtration unit

2016-19 r

Satya Prakash Shukla, Sanath Kumar, Vidya Shree Bharti, Kundan Kumar, Saurav Kumar, Nalini Poojary r

The prototypes of the upgraded filtration units up to a capacity of 5000L/h were developed and trials were completed. Following are the notable features of the units. r

The water filtration unit with an electrically charged column can treat the contaminated water without any use of chlorination and de-chlorination chemicals. The unit was able to remove about 40% Arsenic (III) from water at 5ppm initial concentration. Trials of the unit with *Vibrio* spp. showed complete elimination of 10^4 CFU/ml of bacteria using the filtration unit. The unique feature of the technology is its chemical free



Horizontal column mode filtration device



Prototypes of water filtration units (Capacity 1200-5000 L/h) r

disinfection process. The water is aerated through column without any additional device for aeration. A successful preliminary trial for WSSV removal was demonstrated with the filtration unit. r

The technology developed in this project has wide ranging applications in water sector. It has shown promising results during the trials for the removal of arsenic, chromium and emergent pollutants. The technology can be used for chlorine/ozone free disinfection of water including ground water, municipal water, sewage water and industrial effluents and recreational water (swimming pools). The technology is not specific to aquaculture sector but it can be used for water treatment in various sectors where environment friendly treatment of water is required. The capacity of the column bed can be up-scaled to 5000-10000 l / h i.e. 1.20 to 2.4 lac liter per day by expanding the column bed. r

Disease pattern and health assessment of *Pangasianodon hypophthalmus* in cage culture ecosystem

2017-2019 r

Gayatri Tripathi, Kiran Dube Rawat, Shashi Bhushan, Husne Bano and Rath Bhuvneshwari r

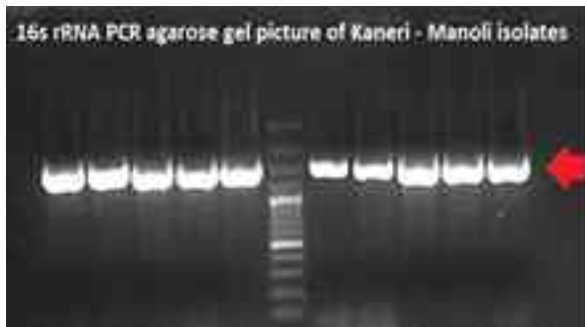
The present study was carried out to catalogue seasonal prevalence of parasitic and bacterial pathogens in *Pangasianodon hypophthalmus* and to identify stress factors posed by the enclosures and high stocking density. The studies were also conducted to identify physicochemical and environmental drivers of disease spread in catfish cultured in cages of selected reservoirs of Maharashtra during April 2017 to March 2019. r

The sampling was conducted in Kanher, Manoli, Varasgaon and Panchet reservoirs during summer, winter and rainy season. The physico-chemical parameters of water showed a significant difference between the seasons. The catfish exhibited petechial haemorrhages on the body surface, lesions on the fins and around the mouth region was collected for analysis. Gill fluke (*Dactylogyrus* sp) parasite was isolated from pale colored gills during the summer

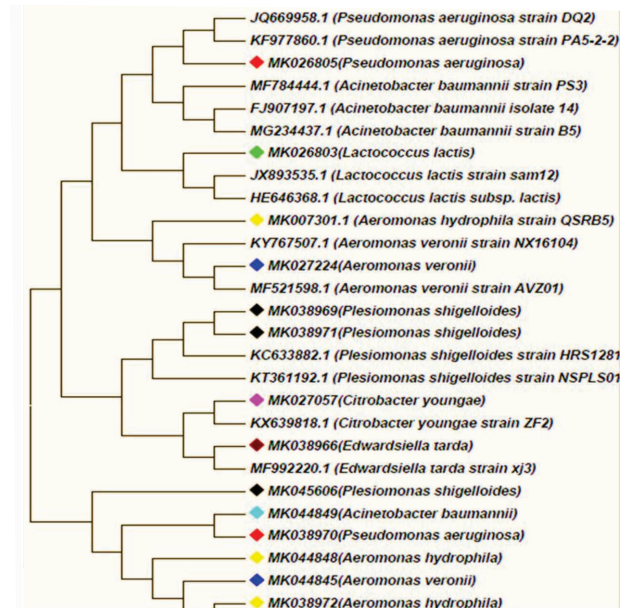
season whereas protozoan Trichodina parasite was moderately prevailed during the winter season. During bacteriological examination, 50 bacterial isolates could be identified and characterized by biochemical tests as well as 16s rRNA sequencing. Their NCBI accession numbers have been received and phylogenetic tree revealed the *Aeromonas veronii* (25.8 %) was seen as the most prevalent isolate followed by *Pseudomonas aeruginosa* (13.7%). The *Pseudomonas* sp was prevalent during the summer season in all four reservoirs. Total 8 nos of fish pathogenic bacteria ie. *Edwardsiella tarda*, *A. veronii*, *Lactococcus lactis*, *P. aeruginosa*, *P. putida*, *Pleisomonas shigelloides*, *Citrobacter freundii* and *A. baumannii* were characterized from the study and a histopathological study of the vital organs of infected fish concluded the extent of damaged caused due to these bacteria. This would be the first information on health status of cage cultured catfish with respect to environmental stressors in freshwater reservoirs of Maharashtra State. This information could suggest the adaptation of effective prevention and control strategies having increased awareness for timely investigations and identification of specific biotic and abiotic risk factors to avoid pathogen prevalence in freshwater cage fish farming. r



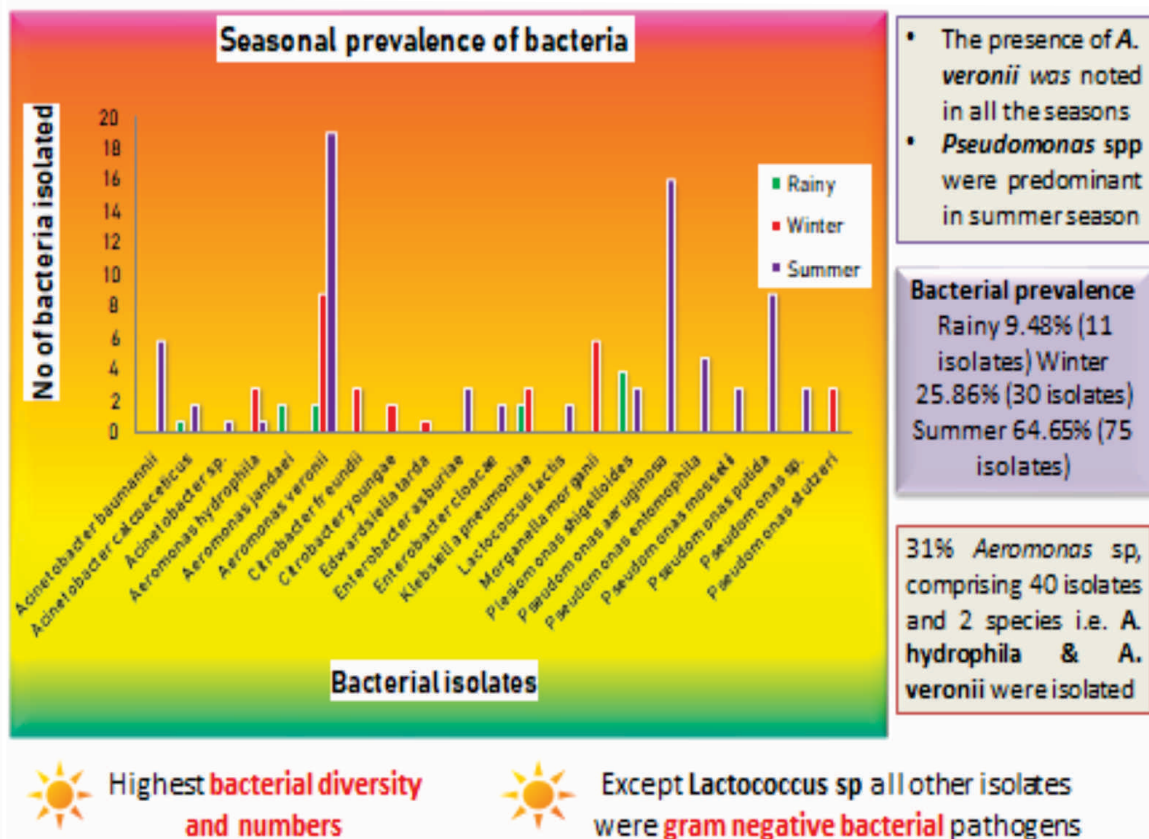
The fish exhibited petechial hemorrhages on the body surface, lesions on the fins and reddening around the mouth region r



Amplification of 16S rRNA genes of bacterial isolates



Phylogenetic Tree of the isolated bacterial pathogens r



Seasonal prevalence of bacterial pathogens r

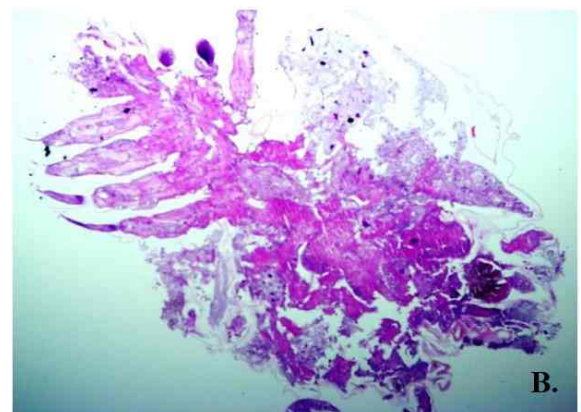
Development of phytotherapy against *Argulus* parasite of fish

2017-19 r

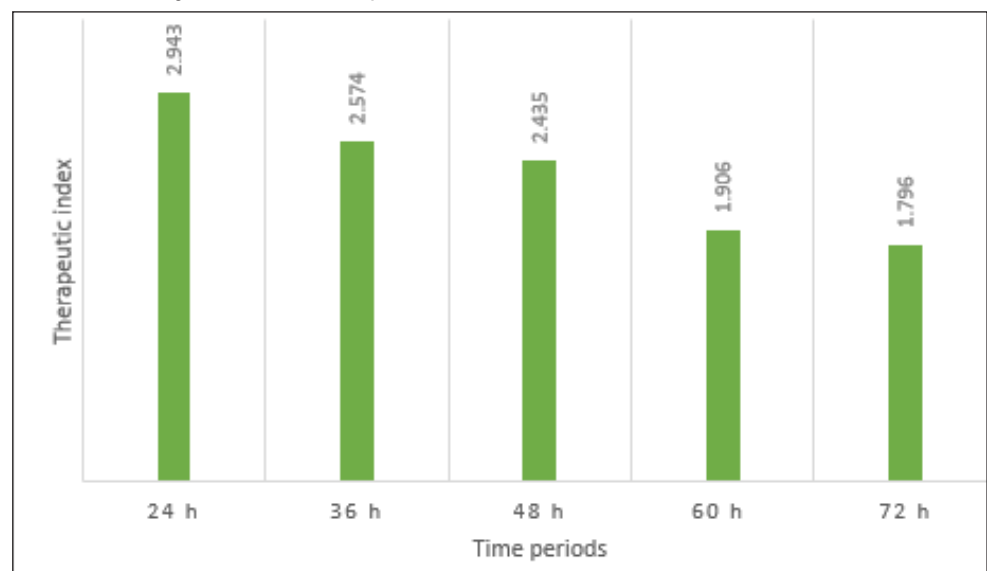
Ram Prakash Raman, K.V. Rajendran and Saurav Kumar r

The project was undertaken to evaluate the antiparasitic efficacy of neem (*Azadirachta indica*) and pyrethrum (*Tanacetum* sp.) extracts on fish lice *Argulus* infestation in goldfish (*Carassius auratus*). The experiments showed that among the organic solvents extracts, ethanolic extract of neem leaf was significantly effective in killing the *Argulus* r

sp. but it was not found safe under *in vivo* conditions. Further, aqueous extract of neem leaf @ 3 g/l caused 100% mortality of *Argulus* sp. with an acceptable level of therapeutic index value of 1.796 at 72 h under *in vivo* condition. Hence, this treatment has been recommended for control of *Argulus* sp. in goldfish *Carassius auratus*. On the other hand, pyrethrum extracts showed high toxicity against both *Argulus* and goldfish. However, ethanol extract of pyrethrum can be only used as a dip treatment for 5 min @ 0.6 g/l to detach the parasite off host. r



Microscopic photograph of ventral view of juvenile *A. japonicus* with control group showing normal architecture (A), treated group (ethanolic neem leaf extract) showing damaged branchial and compound eye region (indicated by arrows) in the parasites H&E, 10x (B). r



Therapeutic index of aqueous extract of neem leaf at various time periods tested against *A. japonicus* in *C. auratus*. r

Green Feed for Carps

2017-2020 r

Nartottam P. Sahu, Prem Prakash Srivastava, G.H. Pailan, Parimal Sardar, Subodh Gupta, Munil Kumar, S. Dasgupta, Ashutosh Deo, Sujata Sahoo, Md. Aklakur, Sikendra Kumar, Tincy Varghese, Shamna N, Manish Jayant, Dilip Kumar Singh

Out of 26 leaf screened, six types namely *Hygrophila spinosa* (Gokulakanta), *Vigna mungo* (Black lentil), *Mentha arvensis* (Corn mint), *Ipomea aquaticus* (Morning glory), *Arachis hypogaea* (ground nut leaves) and *Cympapagon citratus* (lemon grass) were selected based on their nutritional quality and antinutritional factor contents as potential replacements for de-oiled rice bran (DORB) to the maximum possible extent. The feeding trials of the above six leaves have been completed. r

Growth performance:

Hygrophila spinosa r

HSLM can be included at 30% in the diet of *Labeo rohita* fingerling by completely replacing DORB (30% inclusion) without any detrimental effect on growth for a period of 60 days. r



Vigna mungo r

Growth performance was found to be higher in 20 % inclusion of *Vigna mungo* r (Black gram) leaf meal than control diet. 10 and 30% inclusion of *Vigna mungo* (Black gram) leaf meal resulted in similar growth



performances as the control confirming that *Vigna mungo* (Black gram) leaf meal can replace DORB completely. r

Ipomea aquatica r

Growth performance of *L. rohita* was highest at 10% level of ipomea-based diet. There was no significant difference between groups fed with 20% ipomea based diet and control diet, suggesting that the leafmeal can replace DORB upto 20% level of inclusion. r

Arachis hypogaea r

The growth performance of 10% inclusion level of ground nut leafmeal was similar to



that of control. However, at 20% and 30% inclusion levels, it performed better than DORB based diet (control). r

Mentha arvensis r

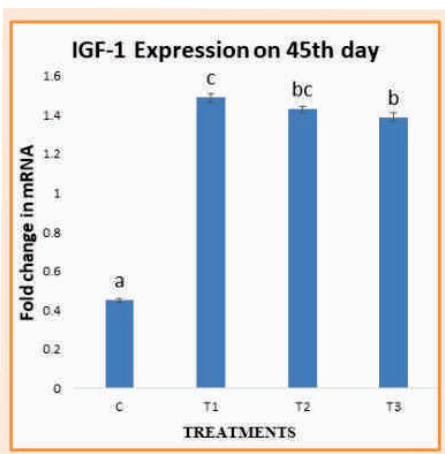
There was depletion in growth with the inclusion of *Mentha arvensis* leafmeal, even at 10% inclusion in inland saline water.

Cympapagon citratus r

The growth and metabolic performance of 15% lemon grass based diet incorporated with enzyme was comparable to the control group without enzyme (30% DORB), indicating that the lemon grass meal can replace 50% of rice bran with enzyme supplementation. r

Nutrigenomic studies

Expression of growth genes was evaluated to understand the inclusion level of *Ipomea aquatica* leaf meal. Expression of IGF-1 gene was found to be higher in T1 (10% inclusion) group and lowest mRNA expression was found in T3 group suggesting that high inclusion level of IALM based diets can have detrimental effects on the growth. The IGFBP- 1 expression was found to be highest in T3 (30% inclusion)



Temporal quantification of IGF-1 expression in liver of different experimental groups r

T1 – inclusion level of *Ipomea aquatica* (10%); T2- inclusion level of *Ipomea aquatica* (20%); T3 - inclusion level of *Ipomea aquatica* (30%) r

group and the lowest expression was observed in T1 (10% inclusion) group. The IGFBP-1 gene expression levels obtained in this study was inversely related to the growth data. r

Alternate feeding strategies

Alternate feeding of 30% lemon grass based with 30% DORB based feed performed similar to that of continuous feeding 30% DORB based feed with supplementation of exogenous enzyme. r

In another experiment, alternate day feeding of 20 and 30% *Vigna mungo* based feed showed a similar growth and physio-metabolic profile as of control (20% *Vigna mungo*). r

Physiological effects of anti-nutritional factors

Feeding trial with hydrolysable tannin revealed that it causes a weight reduction at 3% inclusion in the diet; however, 1 and 2% inclusion was not detrimental to the fish. Meanwhile, saponin caused a poor growth performance from 1% inclusion onwards. The hepatic aminotransferase and SOD activities were elevated due to both tannin and saponin inclusion with saponin inducing more stress response compared to tannin. r

Standardization of the process for preparation of castor seed protein isolate

The castor seeds were procured from Shri Ganganagar District of Rajasthan. The seeds were decorticated manually and defatted by solvent extraction method using petroleum ether and processed for preparation of castor seed protein isolate. Twenty-four combinations of different pH were used to standardize the process for preparation of castor seed protein isolate. The Dry matter recovery and protein recovery was found to be maximum, being 49.83% and 78.68 %, respectively. The crude protein content of prepared protein isolate was 92.55%. r

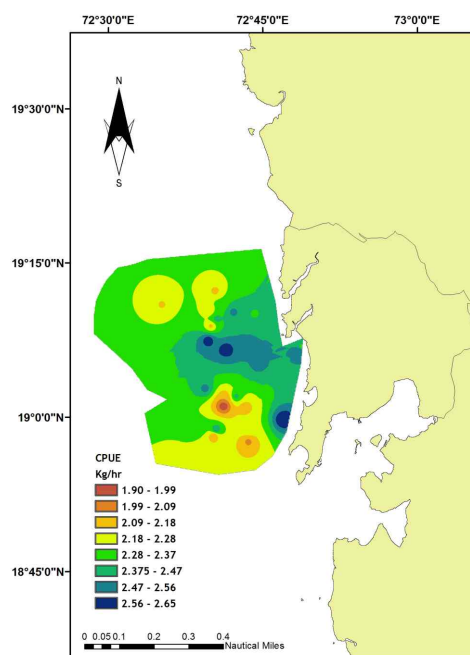
Effect of extraneous factors on trophic chain linked to non-conventional resources for sustainable management

2017-20

Geetanjali Deshmukhe, Binaya Bhusan Nayak, Latha Shenoy, Ashok K. Jaiswar, Amjad Khan Balange, Asha T. Landge, Zeba J. Abidi, Sanath Kumar, Manjusha L, Martin Xavier, Shashi Bhushan, Karan Ramteke, Layana P r

Technical Associates: Satish Kamat, M. K. Chouksey, Avinash Sable, Pawan Kumar, Bhanudas Phande r

The average juvenile percentage per haul was estimated at 40%, followed by discard catch of adult fishes (35%), commercial catch of adult fishes (23%) and marine debris (2%). Adults of low value non-



Sampling stations with CPUE



Diversity of fish catch r

conventional resources like *Charybdis callianassa*, *Trypauchen vagina*, *Odontamblyopus roseus*, *Lagocephalus inermis*, *Minous inermis*, eels, stomatopods etc. comprised the discard catch. Analysis of category-wise marine debris showed that plastics were the most dominant (56.90%) followed by fishing materials (20.20%), natural debris (18.80%) and rubber materials (4.10%).

Collection of water samples for biotic and abiotic factors, fish samples, and data on fishery, from the selected stations were carried out in this study. Total 37 phytoplankton, 15 zooplankton and 13 benthos species were recorded. A total of 49 species belonging to crustaceans and fishes were hauled. The fish composition was *Coilia dussumieri*, *Squilla*, *Johniops microrhynchus*, *J. batangeri*, *J. vogleri*, *Loligo* sp., *B. macaleangi*, *T. therapys* and *Harpadon nehereus*. 3 species of prawns and acetes were also noted.

Two new species of *Grateloupia*— a red seaweed namely *G. catenata* and *G. orientalis* were recorded for the first time from Tamilnadu and Andhra Pradesh coastline. *G. Lithophila* was recorded for the first time from Ratnagiri. These species have high protein and fibre content and can be potential food/feed from Indian coast. Combination of Na-alginate with seaweed phenolics and glycerol was tried for optimizing the anti-oxidant value of fish products.

Taxonomic evaluation of selected teleosts occurring in Indian waters

2016-19

Ashok Kumar Jaiswar, Amjad Khan Balange, Annam Pavan Kumar, Shashi Bhushan, Karan Ramteke

Technical Associates: Satish Kamat, Pawan Kumar

A total of 35 species belonging to Mugilidae, Hemiraphidae and Exocoetidae have been collected from different geographical locations of India (Mumbai, Ratnagiri, Mangalore, Kochi, Mandappam, Orissa, Kolkata, Digha, Allahabad). The morphological characters have been recorded. The morphometric and meristic traits have also been recorded. Tissue from the fresh

specimens were taken for molecular analysis/ barcoding. Later, the otolith was extracted from each species for shape analysis. In case of the fresh specimens the eye lens was taken for study of protein profile.

Abnormal specimens of *Hemiramphus far* lacking pelvic fin were recorded. Two specimens of *Hemiramphus limabtus* with deformed beak were recorded. Morphotypes of *Cheilopogon spilopterus* were collected and are being analyzed for their characters in depth for confirmation. New distributional range of *H. pelagicus* (first report from West Coast of India) has been noticed.

Genetic improvement in *Clarias magur* (Linnaeus, 1758) through selective breeding and gene banking

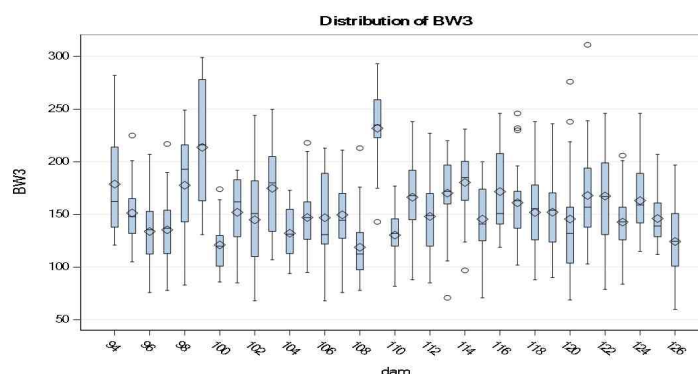
2017-22

Shrinivas Jahageerda, Thongam Ibemcha Chanu, Arun Sharma, Sunil Kumar Nayak, Lenin Singh Angom, Shamna N, Sikendra Kumar

In this study, 56 families of magur were produced and are being reared in CP tanks.



Selective breeding of magur



Bodyweight of *Clarias magur* at 9 months pond age reared at Balbhadrapuram and Powarkheda Farm

Of these 56, 28 are half-sibs and 28 are full-sib families. 40 families with higher densities will also be reared at Powarkheda @150-200/family for multi-location testing. A total of 1233 fish from 33 full-sib families produced in 2017 were tagged in the month of May 2018. A total of 869 animals are stocked at Balabhadrapuram centre and 364 animals in Powarkheda Centre of CIFE. r

A workshop on the 'Genetic Improvement of *Clarias magur*: Present status and future prospects' and an 'Interactive Meet with Farmers' and distribution of Magur seed was organized on 15-16 March, 2019 at Freshwater Fish Farm, Balbhadrapuram, Kakinada Centre. r

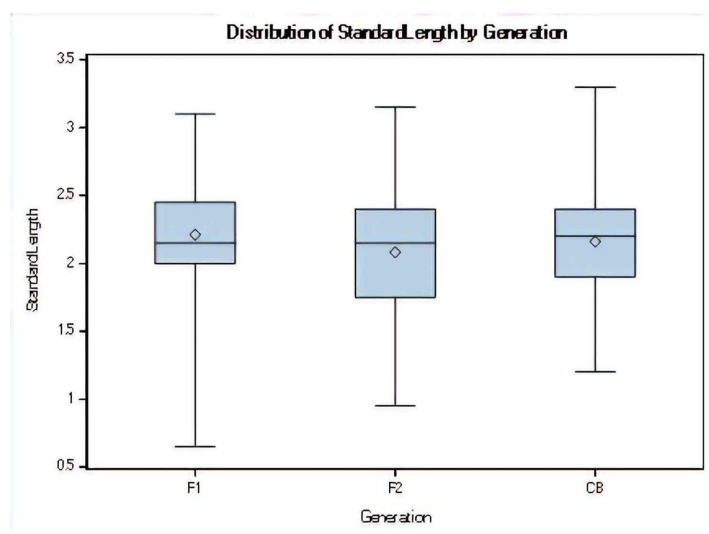
Development of inbred lines of zebrafish and assessment of inbreeding depression

2015-18 r

Gopal Krishna, Mujahidkhan Pathan, Shrinivas Jahageerda, Aparna Chaudhari

Strong population structuring observed in 5 wild zebrafish stocks with mitDloop marker. Heritability for body weight, standard length and sex ratio was estimated as moderate. Molecular F calculated using 20 selected microsatellites correlated with genealogical F indicating the possibility of estimating inbreeding coefficient without pedigree information. r

Under this project the Centre for Zebrafish Breeding and Genetic Research has been established and the pedigreed zebrafish are being sold to researchers on request. r



Box Plot of standard length of F1, F2 inbred generations and cross-bred zebrafish r

Enhancing the utilisation of non-food fish and seaweed through technology refinement and upscaling

Program leader: Gopal Krishna r

Captive maturation and induced reproduction of Red-line torpedo barb, *Sahyadria denisonnii* (Day, 1865)

2018-2020 r

Madhuri Pathak, Mujahidkhan Pathan, Tincy Varghese, Angom Lenin, Shivaji Argade, Neha Qureshi, Manish Kumar, Husne Banu r

Two hundred fishes of size 2.5 to 3.5 inches were collected from Chalaukudy river, Kerala and transported to ICAR-CIFE, Mumbai. The fishes were acclimatized to cement pond and glass aquarium rearing. Currently, the fishes are reared in glass aquariums (200 litres capacity @ density of 1 fish/20 litre water approx).

The fishes were reared under automated aeration cum water filter system. These aerators provide water flow like condition in the aquarium. The fish culture room with LED lighting for 14 hours light and 10 hours of darkness was regularly maintained. The fishes were fed *ad libitum* four times a day. Initially, the fishes were fed with formulated feed, tubifex and other ornamental fish foods. The acceptance level was quite low. Hence, the fishes were fed artemia and Tetra Flakes. Therefore feeding with artemia and Tetra feed (commercially available) was done daily twice. About 10% of water was exchanged on daily basis. The filters were cleaned every three days and aged, well aerated fresh water was added to fish tanks regularly. The fishes were very sensitive to movement and were rapid swimmers. They usually took moving feed and also slow sinking feeds.

All the fishes were measured for standard length, body weight and body depth prior to stocking in glass aquariums. After rearing for four months, the same traits were recorded and the results show significant growth in fishes. Few fishes were dissected

and the gonads were observed. The fishes are still immature. The blood was collected from large size fishes (to be potential brooders) and profiling of steroid hormones was conducted.

Predictive modelling approach for inland fisheries management under climate change scenario

2018-2021

Vinod Kumar Yadav, S. N. Ojha

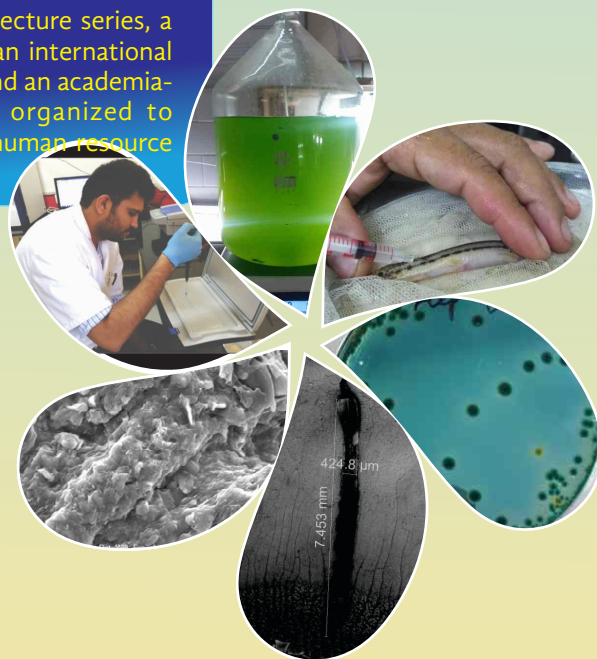
Yearly Inland fish production data of last 57 years were obtained from Maharashtra fisheries department. Quarterly inland fish production of all the district of Maharashtra of different region were obtained from the year 2012-13 to 2017-18. The meteorological data for the three states, Maharashtra, Gujarat and Madhya Pradesh had been requested to Indian Meteorological Department, Pune, and it was received in the month of January-February 2019. The data is from the year 1950 on monthly basis and metrological station wise. The metrological parameter includes mean maximum temperature; mean minimum temperature, lowest minimum temperature, highest maximum temperature total rainfall, and mean wind speed.

The metrological data have been arranged for all the districts of Maharashtra and also for all 7 zones (Konkan, Nashik, Pune, Aurangabad, Latur, Amravati and Nagpur). The data were obtained for monthly temporal resolution and it has been also converted into quarterly temporal resolution. As there were many gaps in temporal and spatial aspects, hence different methods of Interpolations and predictions were done to fill the gaps using the best methods and models (based on Root Mean square error, Average Error percentage). All the metrological data were plotted in GIS (Geographical Information System) Platform and thematic mapping of it for all the districts of Maharashtra at regular interval of 10 years (starting from 1975 to 2017) were done. The data base were created in GIS platform and different query were made for retrieval of data in spatial and temporal domain.

EXTERNALLY FUNDED PROJECTS

Highlights

- Complete sequence of WSSV genome, distinctly different from previous WSSV genomes from India
- Successful breeding and larval rearing of the ornamental fish *Pethia (Puntius) gelius*
- A *Flavobacterium columnare* vaccine showed 81% protection in *Labeo rohita* (rohu)
- A solar-powered cool box developed for storing fresh fish in retail markets
- Reclamation of salt affected sugarcane fields using an innovative technology with aquaculture and sub-surface drainage (SSD) system
- A NAHEP-World Bank & ICAR funded project on culture of shrimp and diverse fish species in inland saline water
- Nutritional requirements of GIFT tilapia and *L. vannamei* reared in inland saline water has been studied
- Under NAHEP project, 8 SDPs, four lecture series, a curriculum development workshop, an international conference, a students convention, and an academia-industry interface program were organized to strengthen education and promote human resource development in fisheries sector





List of Externally Funded Projects

World Bank-ICAR funded project (NAHEP)

1. Development of energy efficient and environmental protective aquaculture technologies for degraded soils

Gopal Krishna r

Department of Biotechnology (DBT), Govt. of India

2. Biomass production and downstream processing of *Spirulina* (*Arthrospira*) *platensis* for high-purity colorant grade Phycocyanin extraction

Satya Prakash Shukla, G. Rathi
Bhuvaneswari r

3. Novel molecular approaches for advancing prediction and mitigation of disease outbreaks in aquaculture for small scale farmers

K. V. Rajendran, Megha K. Bedekar, Sanath Kumar H r

4. Molecular screening, cell culture based isolation and characterization of finfish and shellfish viruses and establishment of National Repository

K.V. Rajendran, K. Pani Prasad r

5. Identification of most suitable population of pearl producing freshwater bivalves of North East India through a molecular approach

Gopal Krishna, Annam Pavan Kumar

6. Protein expression profiling of *Labeo rohita* using quantitative proteomics

Mukunda Goswami, Sanjeeva, Mujahid K. Pathan, M. Gandhi

7. Molecular and genetic characterization of selected ornamental fish of North East India

Mukunda Goswami, R. Nath, Annam Pavan Kumar, R. N. Bhuyan r

8. Captive maturation, breeding and culture of some indigenous ornamental fishes of Assam

B.K. Mahapatra, Parimal Sardar, Subhendu Datta r

9. DNA barcoding and domestication of ornamental fishes of the Chindwin and Barak–Surma–Meghna river basins of Northeast India

S. Munilkumar, B.K. Mahapatra, Annam Pavan Kumar r

10. Development of pelleted diet for *Catla catla* and *Clarias batrachus* using *Achyranthes aspera* and evaluation of its immunostimulatory properties in pond culture System.

Reena Chakrabarthy, V. Harikrishna r

11. Development of nursery based system for Pacific white shrimp, *Litopenaeus vannamei*, using ground inland saline water, and assessment of physiological and immunological parameters in single phase and two phase farming system



V. Harikrishna, Pankaj Kumar, K. Sreedharan, Satya Prakash r

Indian Council of Agricultural Research, New Delhi

12. Network project on fish health

K. Pani Prasad, Swadesh Prakash Tiwari r

13. Network project on assessment of AMR in micro-organisms associated with fisheries and aquaculture in India

K. Pani Prasad, K. Jeena r

14. 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 regions and Western Ghats

Gopal Krishna, Paramita Banerjee Sawant, B.K. Mahapatra, N. K. Chadha, Gayatri Tripathi r

15. ICAR-CRP on Vaccines and Diagnostics, New Delhi

Development of dual combination vaccine for protection of *Labeo rohita* to bacterial pathogens *Flavobacterium columnare* and *Edwardsiella tarda* r

Megha K. Bedekar, Kundan Kumar, Saurav Kumar r

16. Agri-Business Incubation (ABIs) Component II on Incubation Fund under NAIF

Binaya Bhusan Nayak, Arpita Sharma, Amjad Khan Balange r

17. Dissemination of pilot scale results of inland saline aquaculture in different locations of Haryana and Maharashtra

A. K. Reddy r

Rajiv Gandhi Science and Technology Commission (RGSTC), Maharashtra

18. Feasibility study of using solar powered cool boxes to improve shelf life and hygiene of fish sold in retail markets in Mumbai

Sanath Kumar H and Binaya Bhusan Nayak r

National Fisheries Development Board

19. National surveillance programme for aquatic animal diseases

K. Pani Prasad, R. P. Raman r

20. Establishment of Amur common carp / Jayanti rohu hatchery and seed production unit for quality fish seed dissemination.

Sunil Kumar Nayak, Dhalongsaih Reang, Madhuri Pathak r

DST-SERB (Science and Engineering Research Board), Govt. of India

21. Conservation of Indian megafish: Molecular taxonomy and phylogeography of mahseer fish of India

Annam Pavan Kumar

National Agricultural Higher Education Project (NAHEP)

Development of energy efficient and eco-friendly technologies

2018-21 r

Dr. Gopal Krishna

N. P. Sahu, N. K Chadha, K. V. Rajendran, B. B. Nayak, S. Jahageerdar, Geetanjali Deshmukhe, Gayatri Tripathi, P. S. Ananthan, A. K. Balange, V. Hari Krishna, Vidyashree Bharti, Babitha Rani, Aparna Chaudhari, S. N. Ojha, D. S. Bundela, Parimal Sardar, Rupam Sharma, S. Dasgupta, Paromita B. Sawant, Sanath Kumar, Martin Xavier, Saurav Kumar, Shashi Bhushan, Tincy Varghese, Mujahidkhan A. Pathan, Shamna N, Neha Wajahat Qureshi, Pankaj Kumar, Satya Prakash, K. Sreedharan, Ram Singh, Dasari Bhoomaiah r

Rs. 19.94 Crores r

1. Resource availability, characteristics and potential of inland saline soil and water

RS & GIS based mapping of extent and spatial distribution of inland saline water:

Base maps of salt affected areas for Rohtak and Jhajjar districts of Haryana have been prepared. Pre and post-monsoon map of inland water bodies of Rohtak and Jhajjar districts of Haryana have been prepared. For pre-monsoon soil sampling from Fazilka District, Punjab and Rohtak District, Haryana, thematic layers and compilation map has been used. Remote Sensing and Geographic Information System (RS and GIS) based thematic maps has been prepared for studying the distribution of salt affected areas and aquaculture farms of Jhajjar District, Haryana. r

Knowledge resource mapping: Checklist & schedule for knowledge resource mapping has been prepared. A mobile application prototype has been prepared for mapping of farmers knowledge. About 270 farmers from different districts of Haryana, Punjab, Rajasthan and Delhi, and around 50 representatives from aqua-industry (fish seed, fishfeed, aqua-medicine and processing firms), officials from state fisheries departments and scientists from different ICAR Institutions participated in the program r

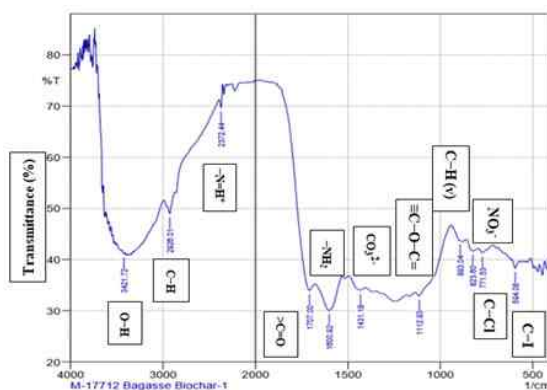
Collection and analysis of soil, water samples and farmers knowledge information along with GPS co-ordinates (pre and post-monsoon):

Study area and sampling plan for collection of soil & water samples include five districts (Rohtak, Jhajjar, Fazilka, Sriganaganagar and Mathura) in 4 states of Haryana, Punjab, Rajasthan and Uttar Pradesh. About 250 water samples from the selected districts of Haryana and Punjab were analysed. Soil samples at the depth of 15cm and 1m were collected. 281 soil samples from Fazilka district, Punjab, and 178 soil samples were collected from Rohtak District, Haryana. A central facility for soil and water analysis has been established at Rohtak Centre of ICAR-CIFE. r

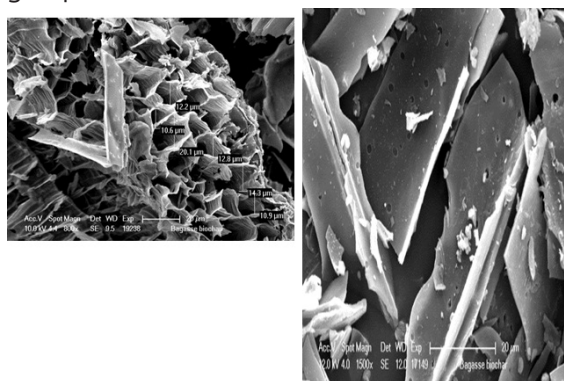
Enriching elemental deficiency, carbon storage and enhancing productivity of the soil

Fabrication of Biochar Kiln and preparation and characterization of biochar, sediment and water:

An electrical Biochar Kiln (dimension 30" height and 24" diameter) with biomass loading capacity of 1.6kg was designed and fabricated at an



FTIR spectra showing presence of functional groups in biochar r



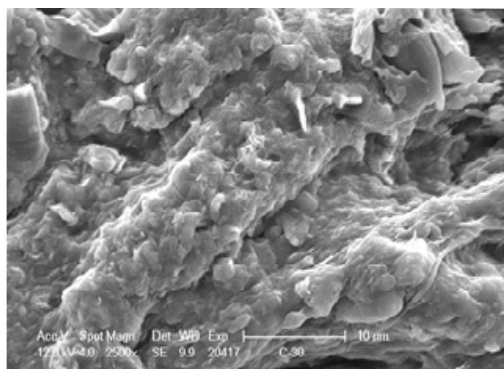
Biochar under scanning electron microscope. r

operational temperature of 1000°C. Water and sediments from ISW were collected and characterised. Two methods of biochar application i.e., sediment mixing and water column mixing have been standardized. Two doses of biochar application @ 9t/ha and 18t/ha were evaluated for enhancing primary productivity in aquaculture systems. The primary productivity was high when biochar was applied at 18t/ha. Biochar mixed sediments improved the water holding capacity and CEC (Cation Exchange Capacity) of soil, while biochar mixed in water column reduced the nitrogenous nutrient (ammonia and nitrate) levels. Biochar nutrient complex was formulated incorporating two potassic fertilizers (potassium chloride and potassium schoenite) at 0.5% and 1%, respectively. The C/N ratio of potassium schoenite biochar nutrient complex has been found to be lower due to high content of nitrogen and sulphur as compared to potassium chloride biochar nutrient complex. Biochar was prepared using Biochar kiln at a pyrolysis temperature of 450°C and the prepared biochar was characterised using scanning electron microscopy.

Biofloc technology for sustainable effluent management in aquafarming



Experimental Biofloc unit at Rohtak



Biofloc under scanning electron microscope

An experimental set up has been designed to standardize *ex-situ* biofloc production. Experiment has been set up for evaluation of efficiency of two flocculating agents in *ex-situ* and *in-situ* biofloc production. An experimental scale unit was set up to develop and evaluate a novel media for *in-situ* biofloc for rearing of tilapia using inland saline ground water in which floc developed using two flocculating agents and water quality was analyzed on zero water discharge conditions. Two experiments done to evaluate the efficacy of 2 bioflocculating agents for *ex-situ* and *in-situ* biofloc production. An experimental *ex-situ* biofloc unit was set up in Rohtak center of ICAR-CIFE. Microbial floc was developed, extracted and was stored in both lyophilised and air-dried forms.

Nutraceuticals for stress mitigation and growth enhancement in ISW

Physico-biochemical changes in fish and shellfish reared in ISW: An indoor Recirculatory Aquaculture System (RAS) has been developed. Tilapia (Genetically Improved Farmed Tilapia, GIFT) fry have been procured from RGCA, Andhra Pradesh and acclimatized. Serum osmolality of ISW reared GIFT varied from 240-380 mOsmol/Kg, which was significantly higher than their freshwater reared counterparts. GIFT were found to get acclimatized in ISW within 12 hours of transfer from seawater.

Studies on suitable stress markers in fish and shellfish reared in ISW: Immune reactivity studies indicated α -5 antibody as a biomarker for evaluating ionic



Recirculatory Aquaculture System at ICAR-CIFE, Mumbai

homeostasis under imbalanced low saline water. Stress markers such as haemolymph osmolality, SOD, catalase and LDH activity have been studied for *P. vannamei* reared in ISW. Stress markers such as serum osmolality, SOD, catalase and NKA activity have been studied for GIFT. r

Protein and energy requirement in fish and shellfish reared in ISW: Protein requirements of *P. vannamei* and GIFT were evaluated and found to be 37% at 10 ppt. A feeding trial with graded levels of protein (20-45%) was initiated to evaluate the protein requirement of tilapia (GIFT) fingerlings and *P. vannamei* juveniles. Digestible energy requirement and PE ratio of GIFT were found to be around 400 Kcal/100g and 105mg protein/Kcal DE at 10ppt, respectively. r

Sustainable fish and shellfish production systems and harvesting and phyto-bioremediation strategies.

Grow-out rearing of tilapia (GIFT) and *P. vannamei* at various stocking densities: Out of 10 renovated ponds (200 Sq.m each), 6 were poly lined. Pre-stocking management activities were carried out. Experimental trials on tilapia (GIFT) have been initiated in inland saline water of low salinity (3 ppt) using advanced fry (avg. 0.5g) at the stocking densities of 2, 4 and 6 per Sq.m. The trials on *P. vannamei* have been initiated using potassium fortified inland saline water of high salinity (10 ppt) using juveniles (avg. 2.5g) at varying stocking densities of 30, 45, 60 per Sq.m. Water quality, feeding and growth are being monitored regularly. Grow-out trials on *P. vannamei* were conducted to find out optimal stocking density in ISA at three different stocking densities (30, 45 and 60 per m²). Salinity of the water was maintained at 10 ppt and selected water quality parameters and feeding were regularly monitored. Better survival and growth parameters were found to be better at 30 no. Per m²). Experimental trials on GIFT have been conducted using inland saline water of salinity 3 ppt at varying stocking densities of 2, 4 and 6 per m² with 2 replicates for each treatment in six nursery ponds of 200 Sq.m each. Water quality parameters were regularly monitored and feeding had been done using commercial feed ad libitum.

Trials on culturing and evaluating suitable aquatic and land plants in saline affected areas: A preliminary survey has been conducted in ISW for existing microalgae, aquatic and land plants. Microalgae (5 species), diatoms (3 species) and blue green algae (2 species) were identified. The growth and survival of seaweed species *Cystosiera* were recorded under experimental conditions. Cultures of *Spirulina*, *Dunaliella*, *Chlorella*, *Scenedesmus* and diatoms and their growth performance were monitored against salinity and alkalinity under laboratory conditions. r

Trials on culturing suitable aquatic and land plants in saline affected areas have been conducted. An inventory of phytoplankton along with environmental parameters for different ISW ponds of Rohtak centre and surrounding farms has been prepared. A total of 23 species have been recorded. Dominant species are Diatoms –(*Pleurosigma*, *Gyrosigma*, *Biddulphia*, *Pinnulari*) Chlorophyceae (*Chlorella*) and Dinoflagellates (*Peridinium*, *Gymnodinium*).



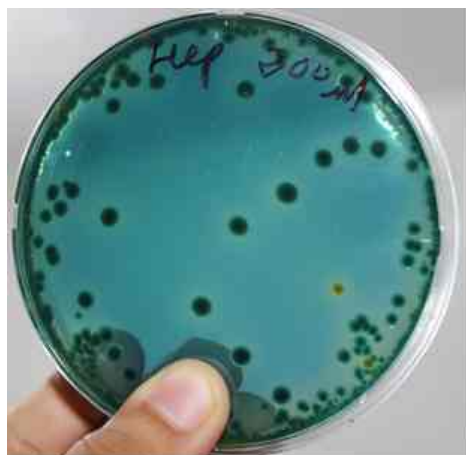
Trials on growth of seaweed in ISW earthen ponds r

Characterization of microbial community using metagenome analysis and correlation with different health conditions of farmed shrimp.

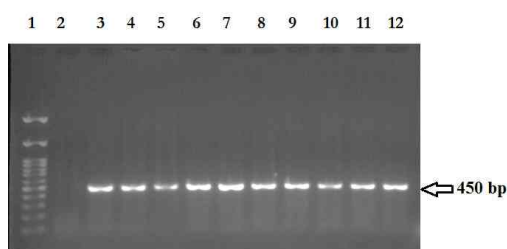
Determination of physico-chemical parameters in selected shrimp culture ponds: Preliminary investigations were conducted on *P. vannamei* farms located in Haryana and Punjab. Water quality parameters of disease affected farms were determined (5 farms). Three shrimp culture ponds (Rohtak Centre) were selected and water quality parameters of these ponds have been monitored.

Molecular screening and characterization of shrimp pathogens and the study of health status of farmed animals in inland saline water using histopathology:

Investigations were conducted on *P. vannamei* farms located in Haryana and Punjab. Thirty samples were tested using PCR for DNA viruses, WSSV, IHHNV, microsporidian, and Entero-cytozoon hepatopenaei (EHP). EHP could be detected for the first time in shrimp farmed in ISW. Bacterial isolates were identified using 16SrRNA gene sequences. Histopathological analysis has been carried out in hepatopancreas of shrimp and different pathological changes have been documented. Water, sediment and shrimp (*P. vannamei*) samples were analyzed from ISW shrimp ponds of Haryana. The *V. parahemolyticus* counts of water were found to be >1400 MPN/100 ml. Sediment showed *Vibrio* counts ranging from 70-476 MPN/100 g, while hepatopancreas had VP counts in the range of 280-476 MPN/100g. In shrimp gut, the VP counts ranged from 392-476 MPN/100g. A total of 107 *Vibrio* isolates were obtained, of which 62 were identified as *V. parahemolyticus*.



TCBS plate showing colonies of *Vibrio* spp



- 1: 100 bp Marker (Bangalore Genei)
- 2: Negative control
- 3: Positive control (*V. parahemolyticus* O3:K6)
- 3-7: Isolates from hepatopancreas of *L. vannamei*
- 8-12: Isolates from pond water

Detection of *V. parahemolyticus* ISW samples with *tlh*-specific PCR

Economically feasible technology for producing value-added fish products from fish grown in ISW.

Risk assessment of pathogens in fish and shellfish grown in ISW: Preliminary investigations were done on the microbial profile of shrimp reared in ISW and brackishwater. Samples of water, sediment and shrimp (*P. vannamei*) from inland saline shrimp ponds of Haryana were analyzed for fecal coliforms and pathogenic *Vibrio* spp. Water and sediment samples were negative for fecal coliforms. *V. parahemolyticus* were detected in samples. Biochemical analysis revealed that pH, TVBN, TMA and NPN values were significantly higher in ISW shrimp as compared with brackishwater reared shrimp.

Refinement of technologies for value addition:

Amino acid profiles of freshly harvested *P. vannamei* reared in brackishwater and ISW were analysed. Fourteen Amino acids were detected. Among them, levels of 8 essential amino acids were found to be higher. Total essential amino acids constituted 17.38g/100g and 16.21g/100g of total amino acid in brackishwater reared *P. vannamei* (BWRV) and Inland saline reared *vannamei* (ISRV), respectively. However, ISWRV meat had higher hydroxyproline, alanine, leucine content than the BWRV products. The products prepared from ISW shrimp had high protein (31.64% w/w), ash content (1.44%) and low fat (2.51) as compared with BWRV coated product. The shelf life of coated shrimp products prepared from ISRV and BWRV shrimp has been found to be 17 days at refrigerated temperature. The fatty acid profiling of ISRV and BWRV shrimps were carried out. The PUFA content of BWRV and ISRV samples were 41.67% and 46.50%, respectively. The contents of EPA and DHA were slightly higher in ISW reared shrimp. The mineral content of BWRV meat had higher (2139.53mg/100g) contents of all minerals determined than ISRV reared shrimp meat (1979.39 mg/100g). The mineral content of BWRV revealed following order K>P>Mg>Na>Ca>Fe>Zn>Cu>Mn>Se and the mineral content of ISRV reared in inland saline water revealed following order >P>Mg>Na>Ca>Zn>Fe>Cu>Se>Mn. A value added product from ISRV had high protein content and low fat content.

Fish and shellfish waste utilization through biotechnological interventions: Trials were conducted for preparation of composite silage by using fish and vegetable waste with *Lactobacillus* fermentation. It was observed that the fish to vegetable ratio of 75:25 yielded a good quality silage. r

Technology transfer and Skill development programs for women self-help groups: A five-day skill development programme on 'Hygienic handling and value addition of fish and shellfish' was held from 11-15 March, 2019 in which 25 candidates participated.

Genetic evaluation of common carp for multi-stocks in multi inland saline environments

Assembling of various stocks of common carp: Two stocks of Common carp from Madhya Pradesh & Andhra Pradesh were assembled. Assembling of various stocks of Common carp from different regions of India and outside India in order to maintain a broader genetic base. r

Designing mating plans and production of families: Broodstock (40 pairs from Andhra Pradesh and 50 from Madhya Pradesh) have been collected and stocked at Kakinada and Powarkheda Centres of ICAR-CIFE, respectively. Microsatellite loci for parentage analysis in common carp has been identified. Thirty number of Amur carp broodstock were procured and transported from Odisha to CIFE, Balabhadrapuram. Sixteen full sib families and 8 half-sib families were produced at CIFE, Balabhadrapuram and 20 full-sib families were produced at CIFE, Powarkheda. r

Acclimatization, rearing and tagging of families: Two month old Common carp fry from ICAR-CIFE Balabhadrapuram/ Kakinada Centre and fish farm of Tanjavur, Tamil Nadu were transported to ICAR-CIFE



Common carp spawns

Rohtak Centre to initiate the salinity acclimatization experiments. Mating plans were designed to produce half sib and full sib families of Common carp. Thirty six families mainly (full-sibs) of common carp are being reared family-wise at CIFE, Balabhadrapuram and CIFE, Powarkheda to attain the tagbale size. r

2. Innovative Pedagogy for fisheries professionals in global era

Organising of Launch Workshop and release of NAHEP-CIFE Logo and Brochure: A brochure for the Launch Workshop of NAHEP has been prepared. The workshop was successfully conducted in the presence of various dignitaries from ICAR Head Quarters, the State Government and CIFE staff on September 15, 2018. The NAHEP-CIFE Logo and brochure were also released. r

Upgrading curriculum and developing learning aids for Masters and Ph.D. Programs: A meeting was conducted during 19-20 May, 2018 with the national and the international experts to revise the course curricula of fisheries Science. A workshop on "Syllabus Revision and Academic Reformation in Higher Fisheries Education" was organized during 18-19 February, 2019 at ICAR-CIFE, Mumbai in which syllabii of 11 disciplines were revised. r

Exposure visit/training and participation of students in national and international events: Ten students attended an international conference "COSFAD" at the college of Fisheries, Ratnagiri, Maharashtra during 17-20, January 2019. Two students attended BRAQCON international conference at ICAR-CIBA, Chennai during 22-25 January, 2019. Three students attended International Fisheries & Aquaculture Expo (AQUAEX 2019) at Hyderabad during 31 Jan to 2 Feb 2019. r



Hapa breeding of Common carp at ICAR-CIFE, Powarkheda Centre



Farmers' Meet at Rohtak Centre r

Organising distinguished lecture series:

Four lectures were conducted on different specialised areas which were attended by all the students and faculty members. International experts from France, Thailand, Norway and Sri Lanka delivered lectures on important topics related to Indian Saline Aquaculture. Around 250 students benefitted from the lectures.

Skill development programs (SDP) for entrepreneurs, farmers & stakeholders:

Eight SDPs were conducted for farmers, entrepreneurs, students, research scholars, technical personnel in various areas of aquaculture and fisheries at CIFE Head Quarters in Mumbai and all five regional centres. A total of 200 participants across the country attended the programmes.

Organising international conference, students' convention, fish fair/alumni meet, awareness campaigns, fish farmer day etc.:

The 3rd International Symposium on "Aquaculture and Fisheries Education (ISAFE3)" was organized on 16-18 May, 2018 at ICAR-CIFE, Mumbai. More than 250 delegates across India as well as foreign countries viz., Bangladesh, Bhutan, Ethiopia, France, Korea, Nepal, Thailand, Spain and Sri Lanka attended. A special session on "Course Curricula in Asia-Pacific region for better job opportunities" was conducted. A National Fish Farmers' Day was organized at ICAR-CIFE, Mumbai on July 10, 2018. Outstanding farmers and fishers were felicitated on the occasion. Lectures on different aspects of aquaculture by experts were organized for students and farmers. A "Sensitization Workshop and Farmers' Meet on Inland Saline Aquaculture" was organized at ICAR-CIFE, Rohtak Centre on 8 December, 2018. An international workshop on "Genomic Selection in Aquaculture" was held during 16-18 January, 2019. A seminar on "Genomic tools and Genetic Selection in Aquaculture" was also held at ICAR-CIFE, Mumbai on 17 January, 2019. The 3rd Students Convention on "Next Generation Aquaculture: Panacea to Employment Challenges" was held during March 25-26, 2019 at ICAR-CIFE, Mumbai. r

3. Academia-Industry Interface

Create a functional and effective interface among academia, industry, development & financial institutions through need assessment, industry-student-faculty directory, industry meet, job fair, etc.



Workshop on 'An overview of Genomic Selection in Aquaculture' at ICAR-CIFE, Mumbai



Conducted an interaction meeting with West- Coast Frozen Foods Pvt. Ltd. regarding possibilities of technology transfer in the field of value addition. r

Strengthening industry participation in academia through visiting lectureships, industry internships, sponsored research, consultancies and co-development of technologies: A lecture on the contemporary scenario of shrimp farming and job opportunities in Indian aquaculture industry was delivered by Dr. D. Nayak, M/s. Falcon Marine. Two consultancy training programmes for students through the industry-consultants were organised at ICAR-CIFE, Mumbai from 18-24 March, 2019 on packaging, labeling, branding and marketing strategies for value added fish products and entrepreneurship opportunities in ornamental fish trading r

4. To develop ICT based support system for aquapreneurs and build capacity of fisheries professionals

ICT for Inland Saline Aquaculture Development (ICT4D): First draft of Good Aquaculture Practices (GAPs) for *P. vannamei* farming in ISW has been prepared based on research carried out at ICAR-CIFE and the scientific literature available in the public domains. Short video clips of many GAPs and success stories of farmers have been captured. Eight BMP modules on *P. vannamei* farming have been prepared in English. Nine bilingual posters/leaflets on

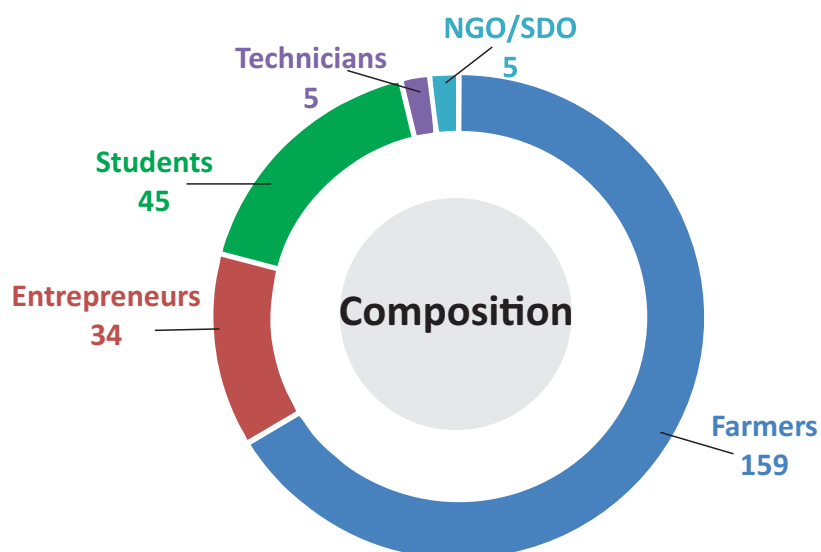
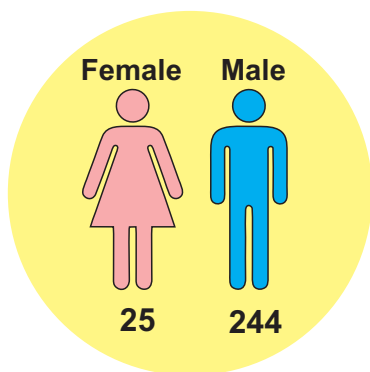
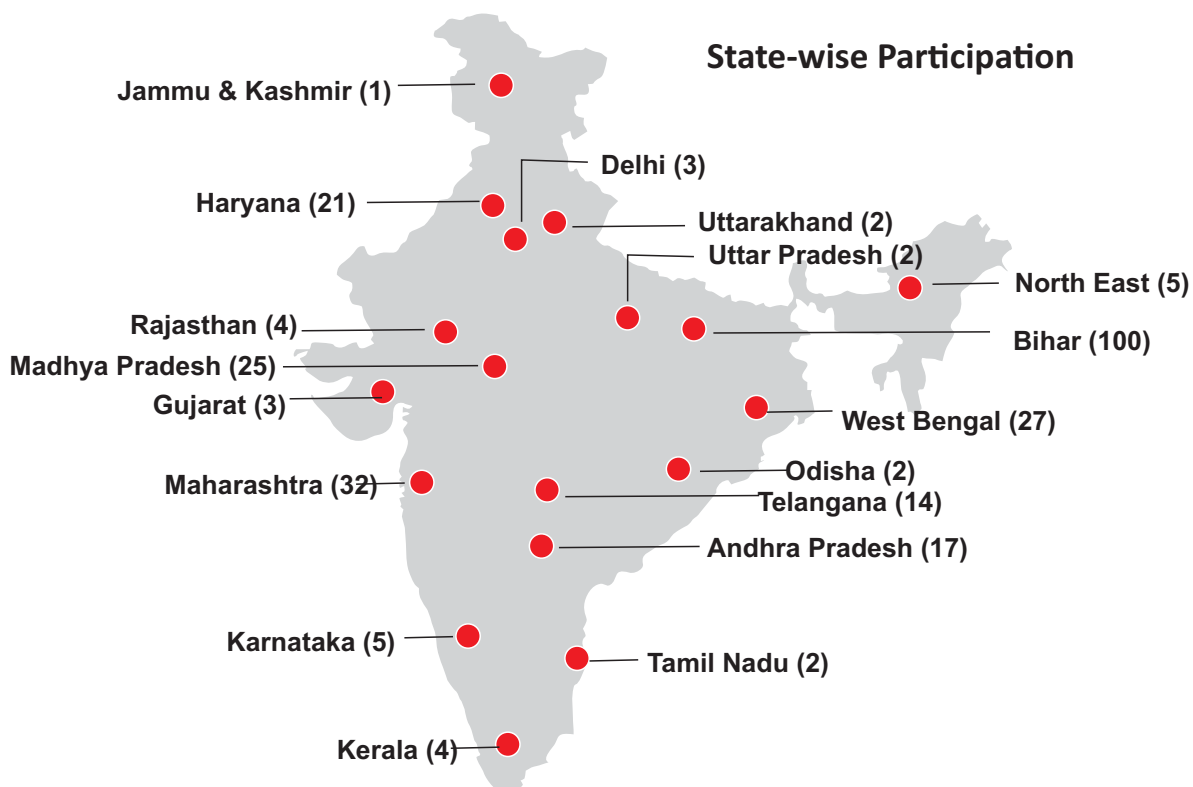
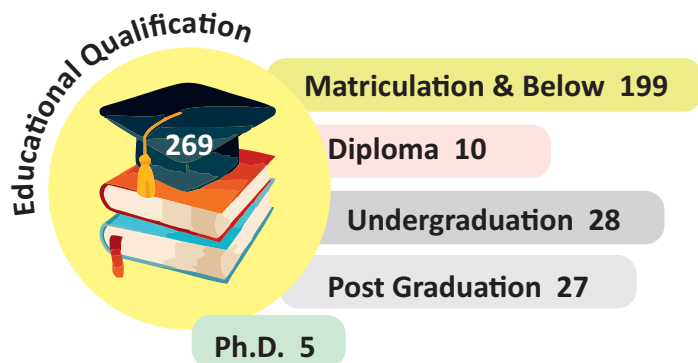
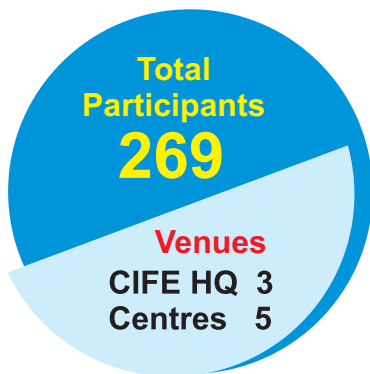
BMPs as well as a 3 min video clip on importance of water quality analysis have been distributed at farmers meet.

Mobilise and network shrimp/fish farmers in inland saline areas for better adoption of GAPs: The contact details of shrimp farmers in Haryana and Punjab have been collected. A survey was conducted to understand farmers present affiliation with farmers associations and their willingness to be part of proposed Shrimp Farmers Network. Prepared a database and baseline profile of 250 farmers from Haryana and Punjab. Established a network of farmers via a WhatsApp group (*CIFE Jhinga*) for sharing information. The WhatsApp group consists of almost 140 active participants. r

Design and launch a dynamic web portal and one-stop multi-purpose mobile app on ISW: A mobile app with advisory, ask experts, diagnostics, help lines, Govt. rules and support, etc has been designed and developed. Course plan for 2 online courses in ISA-3 month program in English for educated youth and entrepreneurs and one month course in Hindi for farmers have been designed. r

Evaluate social, economic and ecological costs and benefits analysis of aquaculture in degraded soils: An appropriate methodological framework is being prepared after accounting for the specific requirements of the study. Baseline survey was conducted in Haryana-Punjab-Rajasthan region covering 120 shrimp farmers wherein their knowledge on salt affected areas and inland saline aquaculture (ISA) was mapped and information access & needs were assessed besides profiling their socio-economic conditions. Important fish markets in the region namely the wholesale Gazipur market in Delhi and retail market in Rohtak were studied to understand the market structure, market conduct, performance and the price trends. r

NAHEP-supported SDPs at ICAR-CIFE



NAHEP-supported SDPs at ICAR-CIFE



Department of Biotechnology, Govt. of India

Biomass production and downstream processing of *Spirulina (Arthrospira) platensis* for high-purity colorant grade phycocyanin extraction

2018-21

S. P. Shukla, G. Rath, Bhuvaneswari

Rs. 38.927 Lakhs

The growth medium formulated for biomass production was further modified by supplementing with graded concentrations of sodium nitrate (10-40 ppm) and ammonium chloride (1-4 ppm). The specific growth rate ranged between 0.36 to 0.76 in nitrate supplemented medium. Among the concentrations tested, 30 ppm NaNO_3 showed highest growth rate (0.76) and corresponding doubling time was lowest (0.91 days). Ammonium chloride supplementation (1-4 ppm) showed a considerable increase in growth rate in the medium supplemented with 2 ppm ammonium chloride. The values for control (normal medium devoid of nitrate medium) and 2 ppm ammonium chloride

supplemented medium were 0.34 and 0.78, respectively. These values corresponded to doubling time of 2.03 and 0.88 days.

Phycocyanin (Pc) extraction through repeated freezing and thawing of the harvested biomass (0.8 mg fresh weight/ml) suspended in 50 ppm phosphate buffer showed highest recovery of Pc after first freezing-thawing cycle. A decline in the concentration and purity of Pc was noticed after first cycle. Therefore, it is concluded that for freshly harvested biomass, the first freezing-thawing cycle yields maximum Pc content and highest purity. The cultures grown in nitrate and ammonium supplemented medium showed no improvement in the Pc content and purity. Though, the growth was enhanced by nitrate (30 ppm) and ammonium chloride (2 ppm) supplementation but the Pc concentration and purity showed a decrease. Therefore, amendment of the medium for further experiments on Pc extraction was not pursued and the normal composition of the medium was used for the biomass production.



Indoor air-lift agal culture units for maintenance of mother culture.



Phycocyanin (Pc) extracted from algae

Novel molecular approaches for advancing prediction and mitigation of disease outbreaks in aquaculture for small scale farmers

2016-2019

K. V. Rajendran, Megha K. Bedekar, Sanath Kumar H r

Rs. 113.456 lakhs r

In this study, a combined approach involving metagenomic sequencing, PCR, histopathology and *Vibrio* culture analysis was used to understand the factors responsible for dysbiosis in *Penaeus (Litopenaeus) vannamei* that lead to disease outbreaks. Normal and disease (WSSV and slow/retarded growth with microsporidian, *Enterocytozoon hepatopenaei*)-affected samples were selected for the analysis.

Metagenomic analysis of shrimp gut and hepatopancreas showed significantly lower *Vibrio* species diversity in WSSV-positive samples, but high WSSV genomic signal (4.4-7.6% of reads). Interestingly, hepatopancreas of WSSV-infected shrimp indicated EHP as a common co-infecting pathogen. A complete 281 kbp WSSV genome sequence could be obtained from the metagenome sequence and comparative overview showed distinct differences from previously published WSSV genome from India. r

Metagenomic analysis of WSSV-dysbiosis showed much higher *Vibrio* species diversity in pre-WSSV samples than in the samples

collected during WSSV outbreak. WSSV infected samples had high WSSV genomic signal (4.4-7.6% of reads). Besides higher levels of *Photobacterium* (potential pathogen), the microbiome showed less diversity.

EHP was detected by PCR in both normal and growth-retarded shrimp. Histology revealed EHP developmental stages in hepatopancreatic cells along with spores and heavy haemocytic infiltration in lumen. Metagenomic analysis detected WSSV signals in all the samples. The normal shrimp showed higher *Vibrio* diversity than the retarded shrimp. Retarded animals showed higher levels of *Burkholderia*, *Achromobacter*, *Shinella* and *Sinorhizobium*. r EHP genome could be successfully mapped to retarded samples indicating the presence of EHP in the gut of shrimp. However, microbiome diversity was found to be comparable in both normal and retarded animals. Parallel microbiological culture-based analysis revealed *V. harveyi* more predominant, ranging from 42 to 61% of total vibrios, while *V. parahaemolyticus* r constituted 27.9 to 38.8%. r

Metagenome analysis was extended to other co-habiting biota, viz., snail, zooplankton and crab. Microbiomes of these invertebrates showed more diversity than that of the farmed shrimp. WSSV signal was either very low or absent. High levels of *Burkholderia* were detected. *Vibrio* species was very diverse, but limited overlap with *Vibrio* diversity was detected in shrimp. r

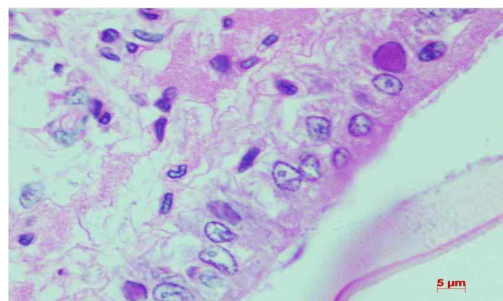
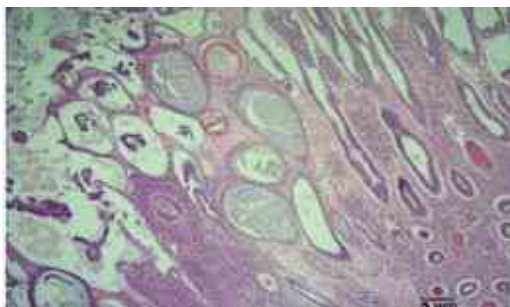


Fig. Histological section of hepatopancreas showing enlargement of haemal sinuses, haemocytic aggregation, nodule formation and melanisation due to acute bacterial infection r

Molecular screening, cell culture based isolation and characterization of finfish and shellfish viruses and establishment of National Repository

2017-2020

K.V. Rajendran, K. Pani Prasad r

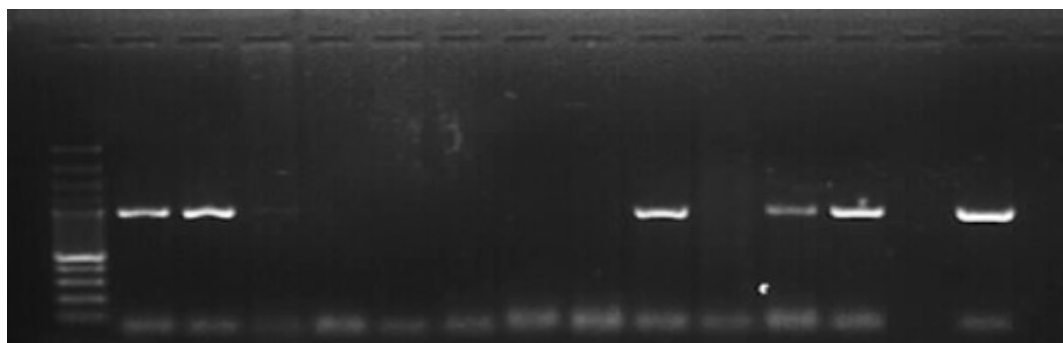
Rs. 98.683 lakhs r

The goal of this research project is the establishment of repository for the finfish and shellfish viruses. Molecular screening of shrimp samples (using PCR) were carried out for white spot syndrome virus (WSSV), infectious hypodermal and hematopoietic necrosis virus (IHHNV), monodon baculovirus (MBV), Hepatopancreatic parvovirus (HPV). Of the twenty-eight shrimp samples (grow-out) tested during the period 10 samples were tested positive for WSSV. However, no other virus could be detected in these samples. The WSSV isolate has been stored at -80°C for further propagation and characterization. Post-larval samples of shrimp were also tested for these viruses but these were found to be negative for all the viruses tested. r

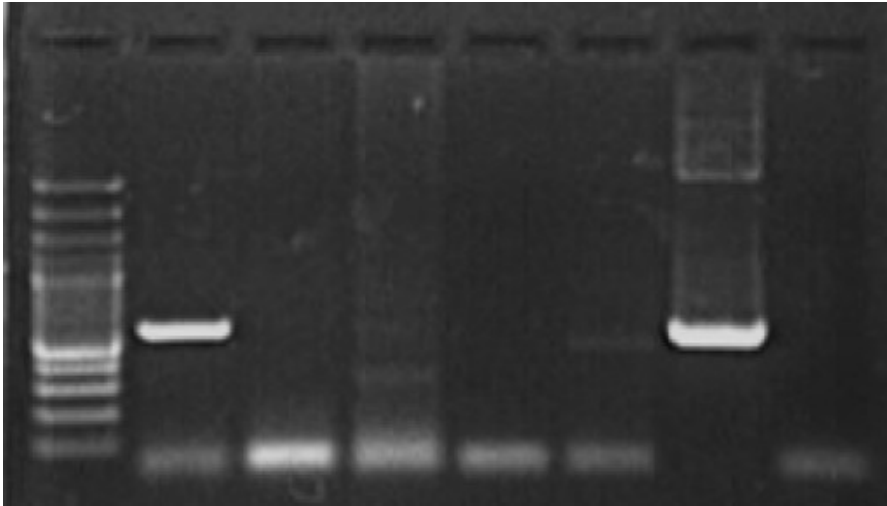
Ornamental fishes were screened for Red seabream iridovirus (RSIV), Megalocytivirus (MCV) and Nervous necrosis virus (NNV) using specific primers and plasmid DNA prepared for respective virus as positive controls. Ornamental fish samples screened include angel fish, guppy (*Poecilia reticulata*), gold fish (*Carassius auratus*) and koi carp (*Cyprinus rubrofuscus*). A total of 136 fish samples

(107 angel fish, 17 gold fish, 5 guppy and 7 koi carp) were screened, of which 24 samples (18 angel fish, 1 gold fish and 2 koi carp) were tested positive for RSIV (570 bp) and 4 were samples (1 goldfish, 2 Koi carp and 1 angel fish) were found to be positive for MCV (430bp). One Discus fish (*Symphysodon aequifasciatus*) was found to be negative for NNV, MCV and RSIV. The RSIV isolate amplified from angel fish has been sequenced and the 570 bp showed similarity with the RSIV isolates reported from other countries. r

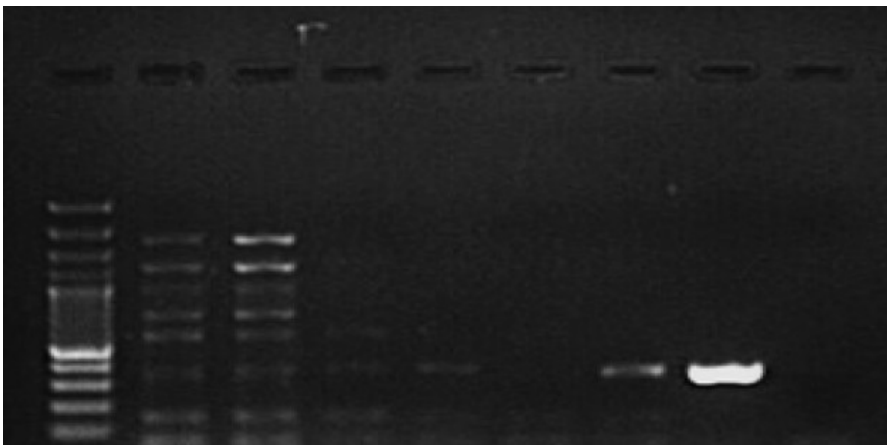
Isolation of viruses using cell line: Snakehead-fish cell line (SSN-1) which was cryopreserved and stored in liquid nitrogen in the Cell Culture Laboratory was used in the experiment. The cryopreserved SSN-1 cell line was revived and cultured in 25 cm² tissue culture flask containing L-15 culture medium supplemented with foetal bovine serum and antibiotic solution. When monolayer was formed, cells were sub-cultured into another flasks (2 flasks) for maintaining the cell growth. When cells reached 50- 60 % confluency, the cell line was inoculated with Nervous Necrosis Virus (NNV) inoculum (prepared from infected seabass samples previously). Cytopathic effect (CPE) was observed after 7 days of inoculation. The cell culture supernatant was tested using NNV detection kit (EnBioGene, Rapid diagnostic kit) and was found to be positive. The NNV positive cell culture preparation has been collected and stored at -80°C for further analysis. r



PCR screening of shrimp samples for white spot syndrome virus (WSSV). Single-step PCR analysis of DNA extracted from gill tissue of *Penaeus vannamei* showing the amplified product of 941 bp. M-Molecular weight marker; G1-G12 samples; NC- Negative control; PC- Positive control r



PCR screening of ornamental fish samples for Red seabream iridovirus (RSIV). Single-step PCR analysis of DNA extracted from pooled tissues (liver and kidney) of Angel fish showing the amplified product of 570 bp. M- Molecular weight marker; B1-B5 samples; NC- Negative control; PC- Positive control r



PCR screening of ornamental fish samples for Mealocytivirus (MCV) Single-step PCR analysis of DNA extracted from pooled tissues (liver and kidney) of Angel fish showing the amplified product of 430 bp. M-Molecular weight marker; AF1-AF6 samples; NC- Negative control; PC- Positive control r



Nervous necrosis virus (NNV) detection in the cultured SSN-1 cell line using NNV detection kit (EnBioGene, Rapid diagnostic kit) r

Identification of most suitable population of pearl producing freshwater bivalves of North East India through a molecular approach

2017-19

Gopal Krishna, Annam Pavan Kumar

Rs. 22.068 lakhs

Five microsatellite markers were used to characterize *Lamellidens marginalis* populations from Rivers Damring (Meghalaya), Brahmaputra (Assam) and Tirap (Arunachal Pradesh). Locus-wise, the number of alleles varied from 5 to 10 with an average of 6 alleles per locus. The mean observed and expected heterozygosity values varied from 0.615 to 0.689 and 0.713 to 0.728, respectively. Pair-wise F_{ST} values ranged from 0.16-0.25 and confirmed high genetic differentiation among the populations. r

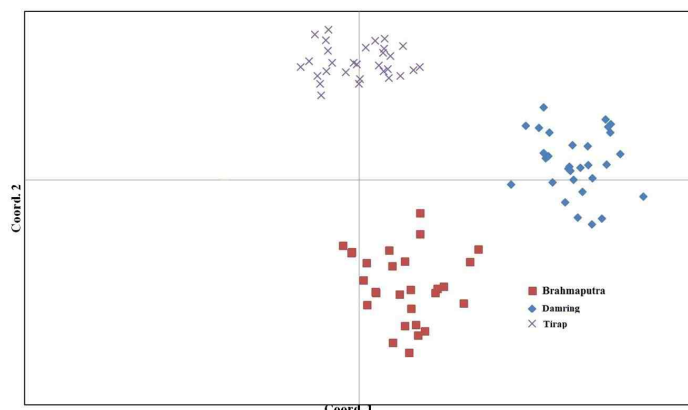


Fig. 1. Scatter diagram based on PCoA of distance variables among populations of *L. marginalis* r

Protein expression profiling of *Labeo rohita* using quantitative proteomics

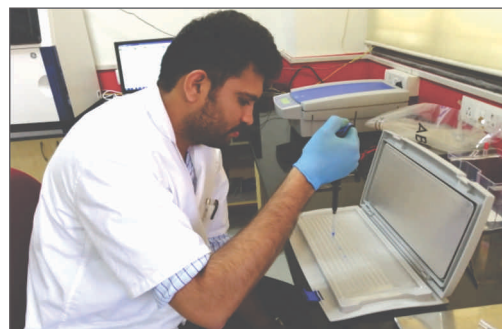
2017-20

M Goswami, Sanjeeva (IIT, Bombay),
Mujahid K. Pathan, M. Gandhi (IIT Bombay) r

Rs. 57.128 lakhs r

Proteins from 10 organs of *Labeo rohita* (skin, gonads, spleen, scale, gut, airbladder, gall bladder, fin, spinal cord and eye) were extracted and quantified using 2D Quant method. The proteins were separated on SDS-PAGE and In-gel digestion was performed. r

The proteins were also digested by In-solution method to increase the proteome coverage. The raw files were analysed using PD 2.2 software with Sequest HT to identify unique peptides and proteins. For differential protein expression, tissue samples were collected from *Aeromonas hydrophila* infected *L. rohita* maintained at CIFE. r



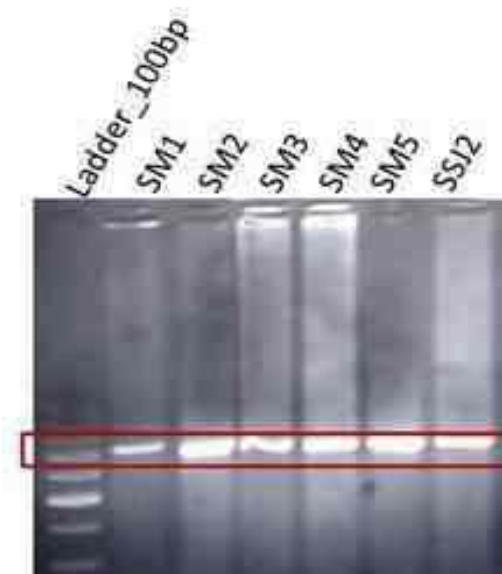
2D gel electrophoresis and imager installed at FGB Division, CIFE. r

Molecular and genetic characterization of selected ornamental fish of North East India

2017-20

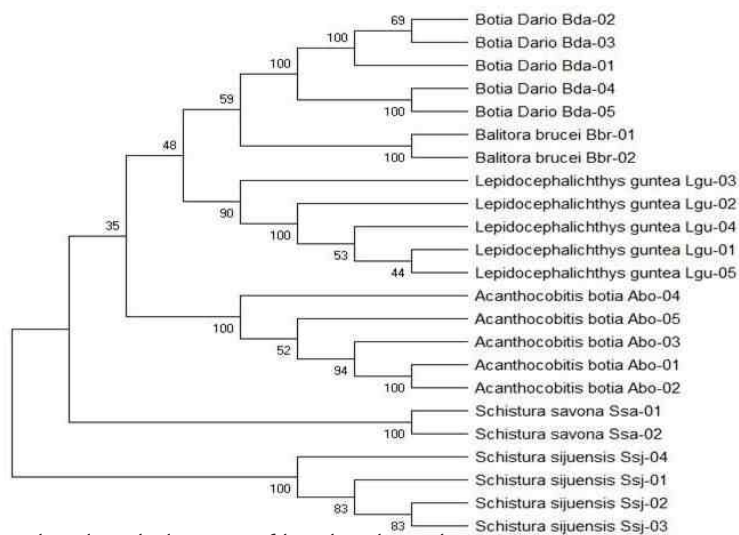
Mukunda Goswami, R. Nath (St. Anthony's College, Shillong), Annam Pavan Kumar, R N Bhuyan (St. Anthony's College, Shillong)

A joint exploration programme was conducted in association with St. Anthony's College, Shillong for collection of 44



PCR amplification of COI gene of selected loach species r

ornamental fish species from Manipur, Tripura and Assam. DNA was isolated and quantified from the collected tissue samples. DNA samples were amplified using COI, 16S rRNA and Cytochrome b mitochondrial DNA genes. The sequence analysis for Loach group has been completed and the sequence is deposited in the GenBank. Sequence analysis for rest of the ornamental fish groups is under process. r



Molecular phylogeny of loaches based on COI gene sequence r

Captive maturation, breeding and culture of some indigenous ornamental fishes of Assam

B. K. Mahapatra, Parimal Sardar, Subhendu Datta r

Rs. 26.36 Lakhs r

Two indigenous ornamental species of Assam namely *Botia dario* and *Pethia gelius* (*Puntius*) *gelius* were selected under this project in ICAR-Central Institute of Fisheries Education, Kolkata Centre. For domestication, fish have been collected from different locations of Assam. Water samples were collected from natural habitat and water quality parameters have been analyzed. The preferred food and feeding habit of these fishes are also studied. Semi-natural conditions are created in the laboratory. Procured fish stock, *Pethia gelius* r from wetlands of Assam were maintained in 3 (Three) different systems i.e., RAS; Cement tank and fiber tank for captive maturation and breeding. For captive maturation of *Botiadario* 4 (four) different indoor and outdoor habitat was created i.e. RAS system (small pieces of 6" dia plastic pipe); cement tanks with and without mud bottom(confined system); and fiber tank with hide out (small pieces of 6" dia plastic pipe and broken earthen pot). *Pethia gelius* r get mature in captive condition, male and female can be identified easily by naked eyes. The percentages of maturity of the stock of different system were studied. Breeding trials of both the species were conducted. Trials failed in case of *Botia dario* r

due to immature gonads in males. Six breeding trial of *Pethia gelius* were done and bred successfully. The larval rearing of six batches of *Pethia gelius* under RAS (flow through system) was conducted successfully. The optimum water quality was maintained throughout the period with the temperature range between 18- 22°C. r

DNA barcoding and domestication of ornamental fishes of the Chindwin and Barak–Surma–Meghna river basins of Northeast India

2017-20

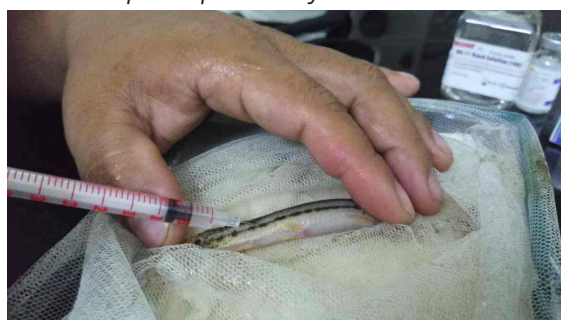
S. Munilkumar, B. K. Mahapatra, Annam Pavan Kumar r

Rs. 24.648 lakhs r

DNA Barcodes were developed for 60 specimens representing 20 species. Sequence analysis is in progress. For remaining 46 species, COI gene was amplified and yet to be sequenced. Barcoded species are *Barilius bendelisis*, *Neolissochilus stracheyi*, *Glyptothorax clavatus*, *Neolissochilus hexagonolepis*, *Chanda nama*, *Ompok bimaculatus*, *Botia dario*, *Poropuntius burtoni*, *Nandus nandus*, *Botia histrionica*, *Macrognathus pancalus*, *Gudusia chapra*, *Psilorhynchus homoleptera*, *Tariqilabeo latius*, *Mastacembelus armatus*, *Garra species*, *Devatio aequipinnatus*, *Hypsibarbus myitkyinae*, *Glyptothorax vetrolineatus*, *Schistura sps1*. Sampling was conducted in different locations of Barak River System including Barak river, Karong; Jiri river, Jiribam; Barak river, Jiribam, Nongren and Barak river, Fulertal, Assam. Specimens were collected from all locations



Lepidocephalichthys berdmorei r



Induced breeding of *L. berdmorei* r

preserved in formalin and fresh tissue in absolute alcohol for further studies. Live specimens of *Lepidocephalichthys berdmorei* and *Trichogaster fasciata* sp were collected and acclimatized in captivity. The length weight analysis is conducted in both wild stock and captive stock. The maximum length and weight observed were 9.2 cm and 4.517g respectively in captivity and 10.1 cm and 7.05g in wild for *Lepidocephalichthys berdmorei*. Water quality parameters Nitrate (0.05-1.7 mg/l), Nitrite (0.04-0.11 mg/l), Phosphate (0.08-0.13 mg/l), COD (8-27 mg/l), Chloride (2.1-13.4 mg/l), Total Nitrogen, TDS (71-142 ppm), Temperature (18-21°C), pH (7.1-7.7) and Iron (0.15-1.12 mg/l) of Barak river, Jiribam, Manipur; Barak river, Fulertal, Assam, Nongren, Imphal East, Manipur, Barak river, Karong, Manipur and Phayeng were analysed. Breeding trials were performed for *Lepidocephalichthys* sp. and response was recorded as unsuccessful. Ovasis was injected @ 0.7mg/kg body. Algal culture in photobioreactor was standardized (Temperature – 24°C, Light Intensity – 10,000 Lux, Agitation – 200 RPM) sustaining upto 17 days at 45 million cells/ml of *Chlorella* sp. using BG11 media. r

Development of pelleted diet for *Catla catla* and *Clarias batrachus* using *Achyranthes aspera* and Evaluation of its Immunostimulatory Properties in Pond Culture System

2015-19

Reena Chakrabarthy (Delhi University),
V. Harikrishna r

The immunostimulatory properties of seeds and leaves of *Achyranthes aspera* (Linn.) was evaluated in Rohu, *Labeo rohita* in the pond conditions. Rohu fry (1.9 ± 0.08 g) were introduced in nine hapas (25 hapa-1) set inside a pond. Two test diets enriched with 0.5% seeds (D1) and leaves (D2) of *A. aspera* and control diet (D3) were fed for 60 days. Then fish were immunized with chicken-RBC and blood and tissue samples were collected on days-7, 14 and 21 after immunization. The average weight was significantly ($p < 0.05$) higher in D1 diet fed rohu compared to other two feeding regimes. Specific growth rate and feed conversion ratio were maximum and minimum in D1 diet fed rohu. Serum lysozyme, myeloperoxidase and nitric oxide synthase levels were significantly ($p < 0.05$) higher in D1 diet fed rohu compared to others. This group was followed by D2 diet fed rohu. Significantly ($p < 0.05$) lower thiobarbituric acid reactive substances (TBARS) and carbonyl protein levels were found in D1 fed rohu compared to others. TBARS and carbonyl protein levels were also lower in D2 diet fed rohu compared to the control one. There were significant ($p < 0.05$) up-regulation of lysozyme C, lysozyme G and tumor necrosis factor- α (TNF- α) in hepatopancreas of rohu fed with D1 diet compared to others. This group was followed by the D2 diet fed rohu. The expression of lysozyme C was higher compared to lysozyme G regardless of feeding regimes. In enriched diets fed rohu, the expression of interleukin 10 (IL-10) was significantly ($p < 0.05$) lower compared to the control fish. Toll like receptor 4 (TLR-4) was significantly ($p < 0.05$) higher in D1 and D2 diets fed rohu compared to other two feeding regimes on day-7 and day-21 after

immunization, respectively. Seeds and leaves enhanced the growth, induced the immune system of rohu and gave protection against oxidative stress in pond conditions. r

Development of nursery based system for Pacific white shrimp, *Litopenaeus vannamei*, using ground inland saline water, and assessment of physiological and immunological parameters in single phase and two phase farming system

2018-2021

V. Harikrishna, Pankaj Kumar, K. Sreedharan, Satya Prakash r

Rs. 57 lakhs r

Six nursery ponds of 200 m² area were constructed, poly lined and filled with water (1.5 m). Post-larvae of *Litopenaeus vannamei* (PL10) were stocked in three different densities (200, 400 and 600) in duplicates. Aeration in the nursery tanks were provided through aerotubes connected with compressor. Water quality parameters such as pH, dissolved oxygen, salinity, total alkalinity, total hardness, calcium, magnesium and potassium were determined frequently. Total heterotrophic and *Vibrio* count of the water samples were also determined using nutrient agar and TCBS agar, respectively. Nursery rearing was performed for a period of 30 days and average body weight and survival rate of the animals in different ponds were measured. Hepatopancreas and gill samples from different ponds were collected and stored in RNA later for the quantitative determination of selected immune related, osmoregulatory and stress associated genes through real time PCR based gene expression. Hepatopancreas was preserved in sucrose and stored at -20° freezer for the determination of stress-associated enzymes.



vannamei nursery pond at Rohtak Centre

Indian Council of Agricultural Research, New Delhi

Network project on fish health

2015-20

K. Pani Prasad, Swadesh Prakash Tiwari r

Rs. 65.00 lakhs r

Farmers awareness programmes on use and misuse of antibiotics were conducted in Maharashtra and Gujarat. Experiment trails on antibiotic residues were conducted. Collected the information from various districts on antibiotic / other drugs used in aquaculture in different assigned states. Also, surveyed farms in various districts of different states of Maharashtra, Goa, Telangana, Andhra Pradesh, Punjab and Haryana on the different disease outbreaks. Undertaken interaction with farmers and collected information regarding their farms and on various problems faced by them during aquaculture farming.

Network Project on Assessment of AMR in micro-organisms associated with fisheries and aquaculture in India

2018-20

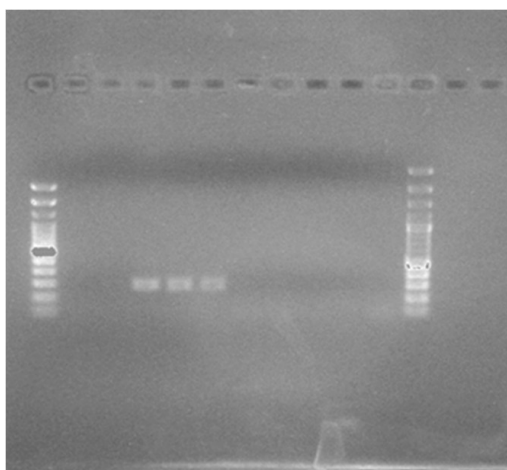
K. Pani Prasad, K. Jeena r

Rs. 30.00 lakhs r

Thane and Ratnagiri in Maharashtra; Surat and Valsad in Gujarat were the districts identified studying AMR in shrimp culture farms. A total of 32 farms in Thane, 6 farms in Ratnagiri and 5 farms in Surat were sampled during the reporting period. *E. coli*, *Vibrio* sp and *Staphylococcus* sp. were isolated from the collected shrimp samples as per the standard SOP. 31 isolates of *E. coli*, 33 isolates of *Staphylococcus* sp. and 37 isolates of *Vibrio* sp. were biochemically characterized. The characterised isolates were subjected to antibiotic sensitivity testing (AST) using Kirby Bauer disc diffusion method. *E. coli* were screened for the resistance to a panel of 17 antibiotics belonging to Beta-Lactams, Cepheims, Carbapenems, Aminoglycosides, Tetracyclins, Quinolones, Folate pathway inhibitors, Phenicol, Macrolides and Polymixins; *Vibrio* sp. were screened for resistance to beta lactams, Cepheims,



AST of the isolated bacteria r



Molecular identification of *Staphylococcus aureus* using nuc gene (target product size-278bp) r

Carbapenems, Aminoglycosides, Tetracyclines, Fluroquinolons, Folate pathway inhibitors and Phenicol. *Staphylococcus* sp. isolated were characterized biochemically and the gram positive and catalase positive cocci isolates were confirmed as *S. aureus* by detection of thermonuclease gene (*nuc*) and 23SrRNA. The molecular identification and confirmation of Coagulase negative Staphylococci (CONS) were also performed by PCR. The sensitivity of *S. aureus* and CONS to Pencillinase-labile penicillins, Aminoglycosides, Tetracyclines, Quinolones, Folate pathway inhibitors, Phenicol, Macrolide and Oxazolidinones were analysed. The antibiotic concentration used and the zone diameter imperative

standards for AST were in accordance with CLSI, 2015. The data generated were analysed using WHONET software and handed over to ICAR-NBFG, the nodal centre for the project.

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 regions and Western Ghats

Phase I 2018-2020 r

Phase II 2010-2023 r

Paramita Banerjee Sawant, B.K. Mahapatra, N. K. Chadha, Gayatri Tripathi r

Rs. 160.2 Lakhs r

Specimens of the striped loach, *Botia striata* r and the yellow panchax, *Aplocheilichthys* spp. acclimatized and being reared on formulated diet in ICAR-CIFE, Mumbai. Maturation diet being prepared using low cost ingredients and attempts ongoing for biological analysis. Experimental fishes, high fin barb, *Orichthys crenuoides*, *Parambassis lala*, *Dario dario* and *Caridina hodgarti*, procured from wetlands of Assam transported to ICAR-CIFE, Kolkata Centre, were acclimated for 15 days in laboratory. *Parambassis lala*, *Dario dario* and the green shrimp, *Caridina hodgarti* were stocked both in RAS (flow through system with the dimension of 160 cm length × 60 cm height × 90 cm width (water volume – 50 lit) and cement tanks (confined system) with the dimension of 75 cm length × 30 cm height × 30 cm width (water volume – 450 lit). Natural habitat was mimicked for easy by providing sandy bottom, gravel, stones along with plantation of ornamental plants similar to the Amazon basin, such as *Vallisneria*, *Hydrilla* for broodstock development under captive condition. Specimens of the high fin barb, *Orichthys crenuoides* were stocked in RAS and fiber tank with dimension of 160 cm length × 100 cm height × 120 cm width (water volume – 100 lit). The fish were fed with *Artemia* naupli, *Tubifex* spp. and *Chlorella* twice a

day. Optimum water quality maintained throughout the period with the temperature range between 22- 26 °C. Trials are ongoing at both Mumbai and Kolkata for maturation and breeding of these indigenous ornamental fish species which are native to the North Eastern Hill regions and the Western Ghats.

ICAR-CRP on Vaccines and Diagnostics, New Delhi

Development of dual combination vaccine for protection of *Labeo rohita* r to bacterial pathogens *Flavobacterium columnare* and *Edwardsiella tarda* r

2015-2020 r

Megha K. Bedekar, Kundan Kumar, Saurav Kumar r

Rs.145Lakhs r

Aquatic Environment and Health Management Division, ICAR CIFE has developed inactivated vaccine against *F. columnare* using local field isolate of *F. columnare* and tested in *Labeo rohita* (rohu) under laboratory and field conditions. Technology of vaccine delivery using immersion method has also been developed and standardized. Present vaccine showed 67-85% protection in various experiments conducted during different seasons and locations under optimum culture conditions. Vaccine showed 81.81% protection under field experiment (water temperature 14-20°C). specific and nonspecific immune parameters (indirect ELISA, total protein assay, serum albumin assay and NBT assay) confirmed the significant immune response elicited by vaccine. Vaccine is stable in lyophilized form at -20 and 4 °C and room temperature. Protective duration has been recorded up to 4 months post vaccination. However, study on protection for longer duration is undergoing. Technology has been submitted to ITMU. Field testing of a dual combination inactivated vaccine against *F. columnare* and *E. tarda* has been conducted in 500 fish fingerlings at Powarkheda center

of ICAR CIFE. Vaccine showed 64% protection in fish fingerlings under field testing. r

Agri-Business Incubation (ABIs) Component II on Incubation Fund under NAIF

2017- 2020 ICAR, New Delhi r

Dr. B. B. Nayak. Dr. Arpita Sharma and Dr. A. Balange r

The ABI and ITMU worked together for the promotion of ICAR-CIFE technologies. Total four numbers of incubatees were registered under ABI during the year 2018-19. They were incubated on backyard hatchery, production process development, value added products and retort processing technologies. ICAR-CIFE and West Coast Frozen Fish Pvt. Ltd., Mumbai have signed MOU on 12th January, 2018 for the collaborative research work. The company has recently undertaken concept marketing of mince based fish sausages from ICAR-CIFE, Mumbai. Total 16 visitors approached ABI Centre for technology transfer, among them 4 were registered as incubatee. Apart from this 135 Self Help Groups were trained for the product preparation by ICAR-CIFE. r

A one day Workshop was organized in collaboration with Rajiv Gandhi Science & Technology Commission (RGSTC), Govt. of Maharashtra for commercialization of technologies arising from RGSTC. Scientists from CIFE and Dr BSKKV, Dapoli and Maratha Chamber of Commerce were also participated the event. Dr. Anil Kakodkar, Padmavibhushan chaired the ceremony.



Workshop on "Commercialization of Technologies" in collaboration with RGSTC and Dr BSKKV, Dapoli and Maratha Chamber of Commerce held on 04th April, 2018 at ICAR-CIFE, Mumbai r

The Farmers and Industry Meet was held at CIFE–Rohtak Centre, for the demonstration of technology in inland saline aquaculture on 8th December 2018. Approximately 200 farmers from Punjab and Haryana States were participated in the program. Representatives from different industries spoke about the various products/technologies available and the common challenges faced by them. One Industry Meet was organized at ICAR- CIFE, Mumbai on 28th Feb., 2019 and the other one at ICAR-CIFE, Kakinada Center on 15th March, 2019 on the theme “Participation of Industry in PG Student's Research” where approximately 40 participants from various sectors of aquaculture industries like, seafood export, fish processing, food additives, food certification, feed industry and ornamental fish industry were also participated. The activities of ITMU and ABI for the promotion of technologies were highlighted during the program. One patent was filed and five new technologies were added to the “Technology Portfolio” of the institute during the year.

Dissemination of Pilot Scale Results of Inland Saline Aquaculture in Different Locations of Haryana and Maharashtra

2017-2020 r

A.K. Reddy (Emeritus Scientist) r

Budget : 35 lakhs r

Funding : ICAR Education Division r

In Sangli and Kolhapur Districts of Maharashtra, reclamation of salt affected sugarcane fields in two units of 4.375 acres



Sugarcane and fish yield from salt affected fields using SSD technology in Maharashtra

each was demonstrated using an innovative technology with aquaculture and sub surface drainage (SSD) system. In Sangli unit, the sugarcane production ranged from 78 to 111.70 tons/acre as against baseline production of 20-30 tons/acre. The highest production of 111.70 tons/acre was achieved by Mr. Abhijit B. Patil of Uran Village, Islampur Taluk, Sangli District which was also highest in Maharashtra state for which the farmer received three awards. In SSD water, fish was grown and the yield was 850 kg/0.20 acre pond. In Kolhapur unit, sugarcane production ranged from 42 to 47 tons/acre in abandoned sugarcane fields for the last 35-40 years. After harvesting of sugarcane, Mr. A. B. Patil attempted in soybean crop. He achieved a production of 16.67 quintals/ acre as against baseline production of 4-5 quintals/acre. r

In Haryana, 38 farmers started Pacific white shrimp *Litopenaeus vannamei* farming in 121 ponds covering 138.75 acres of salt affected agriculture land. The ponds were stocked with *L. vannamei* post-larvae (PL-10) . The stocking densities ranged from 30 to 40 Nos. /m² and the production ranged between 3.5 and 1.0 ton/acre. The average production was 2.365 tons/acre in 110-120 days during the year 2018.

Rajiv Gandhi Science and Technology Commission (RGSTC), Maharashtra

Feasibility study of using solar powered cool boxes to improve shelf life and hygiene of fish sold in retail markets in Mumbai

2016-19 r

Sanath Kumar H and Binaya Bhusan Nayak r

Rs. 15 Lakhs r

The non-availability of conventional electricity in rural India has been a serious limiting factors for food preservation. As a result, huge quantities of perishable foods such as fish are lost leading to economic losses and wastage of foods. Globally about 10 million tons of fish constituting 10% of the fish catch is lost due to mismanagement. This loss can be reduced substantially by making cold-chain facilities available to the



The solar cooler is developed by the Post Harvest Technology department under RGSTC-funded project

producers and the retail vendors. The goal of this project is to develop a storage box for fresh fish using solar cooling technology.

Initially, a prototype cooler was designed for display and storage of fresh fish. The cooler was powered by two solar panels, a charge controller and a solar battery. A DC compressor was used initially, which was subsequently changed to AC compressor. A smart voltage converter was used to convert 12V DC power to 220 AC power. The cooler was originally designed with a capacity of 25 kg. However, with the use of power efficient commercial coolers, the capacity could be increased to 50 kg of fish. The freezer can be maintained at -20°C. However, in order to reduce the consumption of power and prolong the battery period, the temperature of the cooler was maintained at 0-3°C using a thermostat. Since the fish is generally stored in ice, temperature of 0-3°C would be ideal to store the fish in solar cooler. Load tests were done with water and fish. With 25 kg fish, the cooler could achieve a temperature of 0°C within 6 hours. Fish stored in solar cooler was not significantly different with respect to the sensory qualities and were comparable with the ice-stored fish. The solar-powered cooler developed in ICAR-CIFE is expected to reduce the dependency on ice, prolong the shelf life and ensure the quality and hygiene of fresh fish sold in the retail markets

National Fisheries Development Board

National surveillance programme for aquatic animal diseases

2013-18

K. Pani Prasad, R. P. Raman

Rs. 149.70 Lakhs

The baseline information of the following farms were collected and uploaded to the NSPAAD module.

A total of 35 farms has been covered for sample collection and the species *L. vannamei* were collected and screened for different viruses under this programme.



During the period, the major diseases encountered were WSSV and EHP. EHP was more prevalent of in Thane, Maharashtra. The clear sizes variation in individual shrimp length and growth retardation was a characteristic feature of the diseases sample. Awareness programmes and advisory services were rendered to farmers on diseases and antibiotic misuse. All the data has been uploaded on NSPAAD website provided by ICAR-NBFGR.

Establishment of Amur common carp/Jayanti rohu hatchery and seed production unit for quality fish seed dissemination.

2018-21 r

Sunil Kumar Nayak, Dhalongsaih Reang, Madhuri Pathak r

Rs. 25 Lakhs

Design of the Chinese circular hatchery has been given to CPWD. Amur common carp/Jayanti rohu seed was procured from NFDB, Bhubaneswar. r

DST-SERB (Science and Engineering Board), New Delhi

Conservation of Indian megafish: Molecular taxonomy and phylogeography of mahseer fish of India

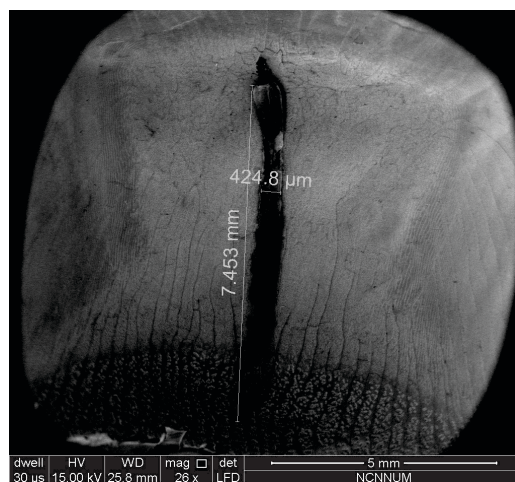
2015-18

Annam Pavan Kumar

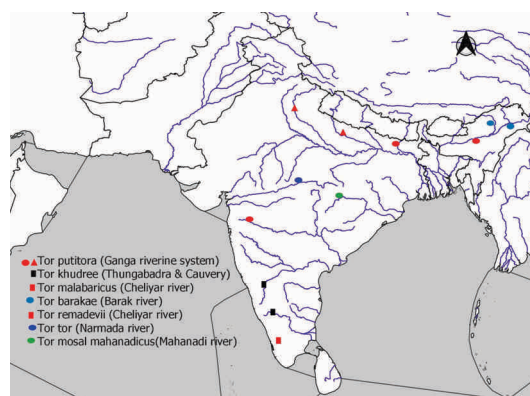
25.8 Lakhs r

Morphological and osteological analysis showed occurrence of 7 *Tor spp.* among specimens collected from 12 geographical locations across India. However, molecular phylogenetic analysis using nuclear and mitochondrial genes revealed 9 operational taxonomic units with distinct lineages in *Tor tor* and *Tor putitora*. r

These genetic lineages could be either sub-species or new species.



Microstructure of lateral line scale of *Tor khudree* r



Geographical locations selected for *Tor* spp. collection r





Extension Achievements



Highlights

Skill Development Training Programmes	:	85
Farmers' Meet	:	18
Exhibitions	:	21
Tribal Sub-Plan	:	14
NEH Programmes	:	02

6.1. Skill Development Programme (SDP)/Refresher Course organized

ICAR-CIFE, Mumbai

Title	Date	No. of participants	State/region of participants
Technical Know-How of Spirulina Biomass Production and Utilization	28 May-01 June, 2018	07	Maharashtra, Kerala
Demonstration and Preparation of Ornamental Fish Feed	12-16 June, 2018	08	Maharashtra, Delhi, Tamil Nadu.
Freshwater Pearl Culture	20 -23 June, 2018	02	Pokhara, Kaski, Nepal
Freshwater Pearl Culture	19 - 21 July, 2018	17	Akola, Maharashtra
Cell Culture Techniques	06-10 August, 2019	07	Maharashtra
Freshwater Pearl Culture	25 - 27 September, 2018	13	Maharashtra
Health Management in Freshwater Fish Culture	03-10 December, 2018	08	Telangana, Maharashtra
Demonstration of Value Added Fish Products	07 December, 2018	50	Haryana
Hygienic Handling and Value Addition of Freshwater Fishes	03-07 January, 2019	25	Powerkheda, Madhya Pradesh
Advances in Aquarium Management Techniques	07-11 January, 2019	08	Andhra Pradesh, Maharashtra, West Bengal and Haryana
Basics in Aquaculture	22-28 January, 2019	22	Nandurbar, Maharashtra
Molecular Taxonomy & DNA Barcodes	05-14 February, 2019	16	Rajasthan, Kerala, Gujarat
<i>Bihar me Machhali Palan me Unnat Taknik avm Pravandhan</i>	11-15 February, 2019	100	Bihar
Value Added Fish Products Preparation	12-13 February, 2019	54	Palghar, Maharashtra
Recent Advances in Aquacultural Engineering	19-25 February, 2019	15	Maharashtra, West Bengal, Haryana, Tamil Nadu, and Tripura
Technical Know-How of Spirulina Biomass Production and Utilization	04-08 March, 2019	09	Maharashtra, Gujarat
Aqua Feed Preparation and Feeding Management	04-08 March, 2019	21	Telangana, Rajasthan. Uttarakhand, Maharashtra, Uttarpradesh,
Modern Methods of Freshwater Aquaculture	08-12 March, 2019	25	Bihar, West Bengal
Hygienic Handling and Value Addition of Fish and Shellfish	11-15 March, 2019	25	Mumbai
Carp Culture Practices and Recent Advances	11-15 March, 2019	30	Chhatisgarh, Madhya Pradesh
Communicating Science	14-20 March, 2018	30	Maharashtra, Haryana West Bengal

ICAR-CIFE Kolkata Centre

Title	Date	No. of participants	State/region of participants
Advances in Freshwater Aquaculture	11-17 July, 2018	10	West Bengal
Entrepreneurship Development in Ornamental Fish Breeding & Culture	31 July-6 August, 2018	13	Bihar, West Bengal, Maharashtra
<i>Mithe Pani Me Machhli Palan</i>	08-14 August, 2018	17	Aurangabad, Bihar
<i>Mithe Pani Me Machhli Palan</i>	08-14 August, 2018	17	Gaya, Bihar
<i>Mithe Pani Me Machhli Palan</i>	21-27 August, 2018	16	Bhojpur, Bihar and Pashim Medinipur, West Bengal
<i>Mithe Pani Me Machhli Palan</i>	21-27 August, 2018	16	Banka, Bihar
Biotechnological Application in Aquaculture	3-7 September, 2018	07	Andhra Pradesh, West Bengal, Assam, Maharashtra
<i>Mithe Pani Me Machhli Palan</i>	11-17 September, 2018	16	Buxar, Bihar and Kamrup, Assam
<i>Mithe Pani Me Machhli Palan</i>	11-17 September, 2018	15	Jehanabad, Bihar
Orientation Programme for MFSc Students	13-16 September, 2018	09	Mumbai, Maharashtra
<i>Mithe Pani Me Machhli Palan</i>	04-10 October 2018	15	Kishanganj, Bihar
<i>Mithe Pani Me Machhli Palan</i>	04-10 October 2018	15	Madhepura, Bihar
Management of Soil, Water and Fish Diseases in Aquaculture	23-29, October, 2018	30	Bihar, West Bengal
Integrated Aquaculture	01-03 November, 2018	50	Ranchi, Jharkhand
Ornamental Fish Breeding and Culture for Women Fish Farmers	24-28 November, 2018	27	Sunderban, West Bengal
Fish Processing and Value Added Fish Products	27 Nov-03 December, 2018	30	West Bengal
<i>Mithe Pani Me Machhli Palan</i>	04-10 December, 2018	14	Supaul, Bihar
<i>Mithe Pani Me Machhli Palan</i>	04-10 December, 2018	15	Araria, Bihar
<i>Mithe Pani Me Machhli Palan</i>	04-10 January, 2019	16	Katihar, Bihar
<i>Mithe Pani Me Machhli Palan</i>	04-10 January, 2019	18	Saharsa, Bihar
Culture of Food Organism for Fish	15-21 January, 2019	08	West Bengal, Telangana, Odisha
Recent Trends in Aquaculture	23-25 January, 2019	50	Mamit, Mizoram
Modern Methods of Fish Culture	24-28 January, 2019	25	Pakur, Jharkhand
Quality Improvement in Ornamental Fish	01-07 February, 2019	12	West Bengal
<i>Mithe Pani Me Machhli Palan</i>	12-18 February, 2019	15	East Champaran, Bihar
<i>Mithe Pani Me Machhli Palan</i>	12-18 February, 2019	15	West Champaran, Bihar
Modern method of fish culture	21-23 February, 2019	13	Amravati, Maharashtra
Integrated Aquaculture	22-24 February, 2019	50	Chandel, Manipur
Ornamental fish breeding & culture	23-27 February, 2019	29	Ranchi, Jharkhand
Integrated Aquaculture	28 February-2 March, 2019	56	Kiphire, Nagaland
Modern Methods of Freshwater Aquaculture	08-12 March, 2019	25	West Bengal

ICAR-CIFE, Kakinada Centre

Title	Date	No. of participants	State/region of participants
Composite Carp Production Technology	15- 0 October, 2018	20	Tamil Nadu
Exposure cum Training to students of P.G.D.I.F & A.M, ICAR-CIFE, Kolkata Centre	05-08 February, 2019	07	Kolkata, West Bengal
Implant Training to Final year B.F.Sc Students from CoF, Tripura	11-20 February, 2019	26	Tripura
Fish and Prawn Culture	15-21 February, 2019	27	Samasthipur, Bihar
Fish and Prawn CultCure	22-28 February, 2019	30	Vaisali, Bihar
Fish and Prawn Culture	05-11 March, 2019	23	Darbhanga, Bihar
Better Management Practices for Shrimp Farming	19-23 March, 2019	25	Telangana, Andra Pradesh
Fish and Prawn Culture	27 March - 02 April, 2019	30	Madhubani, Bihar

ICAR-CIFE, Rohtak Centre

Title	Date	No. of participants	State/region of participants
Production Risks and Better Management Practices of Pacific White Shrimp (<i>Litopenaeus vannamei</i>) Farming using Inland Saline Water	22-26 May, 2018	08	Punjab
Shrimp Culture Practices using Inland Saline Water r	28 May-1 June, 2018	17	Haryana, Punjab r
Management Practices in Inland Saline Shrimp Farming	04-08 June, 2018	29	Haryana, Punjab, Rajasthan r
Inland Saline Aquaculture Practices	18-22 June, 2018	32	Haryana, Punjab
Freshwater Fish Culture and Community Based Aquaculture	20-25 August, 2018	12	Haryana, Delhi, Uttar Pradesh r
Inland Saline Aquaculture Management Practices r	13-17 November, 2018	07	Haryana and Punjab
<i>Litopenaeus vannamei</i> Farming Using Inland Saline Water	17-21 December, 2018	17	Haryana, Punjab and Madhya Pradesh r
<i>Litopenaeus vannamei</i> Farming Using Inland Saline Water r	24-29 December, 2018	09	Punjab
Inland Saline Aquaculture Management Practices	12-16 February, 2019	07	Haryana and Punjab r
On-farm Feeding and Disease Management in Inland Saline Shrimp Farms	18-22 February, 2019	12	Haryana and Punjab
Inland Saline Aquaculture Management Practices	11-15 March, 2019	23	Haryana, Punjab, Delhi and Rajasthan
NFDB Sponsored Training Programme for Aquaculture Laboratory Technician	11 July–04 August, 2018	25	Different States of India r

ICAR-CIFE, Powarkheda Centre

Title	Date	No. of participants	State/region of participants
Fish and Prawn Culture	17-26 April, 2018	18	Bettiah, West Champaran, Bihar
Fish and Prawn Culture	01-10 May, 2018	19	Arrah, Bhojpur, Bihar
Fish and Prawn Culture	15-24 May, 2018	19	Katihar, Bihar
Magur (<i>Clarias magur</i>) Breeding and Hatchery Management	02-07 July, 2018	04	Madhya Pradesh, Tamil Nadu
Carp Breeding and Hatchery Management	16-21 July, 2018	15	Bihar, Maharashtra
Fresh Water Fish Seed Production and Hatchery Management	01-07 August, 2018	18	Madhya Pradesh, Maharashtra, Telengana
Carp and Catfish Breeding, Hatchery and Nursery Pond Management	06-20 August, 2018	12	Mumbai, Maharashtra
Fresh Water Prawn (<i>M. rosenbergii</i>) Seed Rearing and Culture	20-25 August, 2018	05	Madhya Pradesh
Carp Culture Practices and Recent Advances	27 August-01 September, 2018	15	Madhya Pradesh, Uttar Pradesh
Fish and Prawn Culture	26 November - 05 December, 2018	17	Purnia, Bihar
Hygienic Handling and Value addition of Fresh water fishes	03-07 January, 2019	16	Madhya Pradesh
Fish and Prawn Culture	09-18 February, 2019	20	Saran Chapra, Bihar
Fish and Prawn Culture	19-28 February, 2019	18	Mujafarpur, Bihar
Carp Culture Practices and Recent Advances	11 March -15 March, 2019	25	Madhya Pradesh

ICAR-CIFE, Motipur Centre, Bihar

Title	Date	No. of participants	State/region of participants
बिहार में मछली पालन के उन्नत तकनीक एवं प्रबंधन	11-15 March, 2019	100	Bihar, Motipur

6.2. Farmers' Meet Organized

Event	Date	Approx. no. of farmers	Venue
Farmers' Meet under TSP Activity on Advances in Aquaculture	17-18 April, 2018	169	Dimbhe, Maharashtra
Fish Farmers' Day	10 July, 2018	30	FWFF, Balabhadrapuram, Kakinada Centre
Fish Farmers' Day	10 July, 2018	75	ICAR-CIFE, Rohtak, Haryana
National Fish Farmers' Day	10 July, 2018	70	ICAR-CIFE, Kolkata Centre
National Fish Farmers' Day	15 July, 2018	41	Versova Fishing Village, Mumbai
Sustaining enterprise in Sunderban to enhance the livelihood security of the villagers of Kumirmari Gram Panchayet under Gosaba Block, South 24 Parganas, West Bengal	10 September, 2018	55	ICAR-CIFE, Kolkata Centre
Mera Gaon Mera Gaurav (MGMG) Programme	28 September, 2018	113	Dasnagar, Howrah, West Bengal
Rashtriya Mahila Kisan Diwas	15 October, 2018	21	Hingla Devi, Versova fishing village, Mumbai
Mera Gaon Mera Gaurav (MGMG) Programme	13 November, 2018	37	Nimpith, Jaynagar, South 24 Parganas, West Bengal
National Surveillance Programme on "Aquatic Animal Diseases"	24 November, 2018	22	Palghar, Maharashtra
National Surveillance Programme on "Aquatic Animal Diseases"	29 November, 2018	16	Saphale, Maharashtra
Sensitization Workshop, Farmers Meet & Industry Meet on Inland Saline Aquaculture	08 December, 2018	300	ICAR-CIFE, Rohtak Centre
Farmers' Meet on "Improved Technological Interventions in Fisheries for Livelihood Improvement of Tribal Fish Farmers"	14 December, 2018	51	Jawhar Taluka, Palghar District, Maharashtra
Farmers' Meet on "Aquaculture Technologies for Fish Farmers"	15 December, 2018 24 December, 2018	170	Nandurbar, Maharashtra
A One Day Awareness Programme on "Interaction with Tribal Fishermen Community for Livelihood Improvement through Interventions in Fisheries"	07 March, 2019	72	Nandurbar, Maharashtra
Genetic Improvement of <i>Clarias magur</i> Present Status and Future Prospects' and F1 Generation of Magur	16 March, 2019	50	FWFF, Balabhadrapuram, ICAR-CIFE, Kakinada Centre
Farmers' Meet	24 December, 2018	19	Dohlrepda Village, Jawhar Taluka, Palghar District
Farmers' Meet	28 March, 2019	70	Wada Taluka, Palghar District

6.3. Exhibitions Organized

Event	Date	Venue
3 rd International Symposium on “Aquaculture and Fisheries Education (ISAFE3) Theme: Fisheries Education for Sustainability Blue Economy”	16-18 May, 2018	ICAR-CIFE, Mumbai
22 nd National Agriculture Exhibition (Fishery)	03 - 06 August, 2018	Milan Samity Maidan, Nimta, Kolkata
19 th World Congress of Food Science and Technology (International Union of Food Science and Technology-2018)	23-25 October, 2018	CIDCO Convention Centre Navi Mumbai
Krishi Kumbh-2019	26-28 October, 2018	ICAR-ISSR, Lucknow, Uttar Pradesh
ISEE National Seminar-2018	05 - 07 December, 2018	West Bengal University of Animal and Fishery Sciences, Kolkata
Agri-Aqua- Poultry Expo	11-13 December, 2018	National Bureau of Fish Genetic Resources, Lucknow, Uttar Pradesh
Exhibition during the brainstorming workshop on fisheries education	14-15 December, 2018	College of Fisheries, Mangalore r
Exhibition on “Aquaculture Technologies”	15 December, 2018	Nandurbar, Maharashtra r
Bengal Fish Fest-2019	11-13 January, 2019	Nalban Food Park, Salt Lake, Kolkata r
Versava Koli Sea Food festival 2019	18-20 January, 2019	Versova Village, Mumbai r
World Brackish Water Aquaculture Conference (BRAQCON-2019) r	22-25 January, 2019	CIBA, Chennai r



Agri Summit-2019	9-11 February, 2019	Gandhi Maidan, Motihari, Bihar
Exhibition Under the Awareness Programme on “Livelihood improvement of tribal farmers through improved technology interventions in aquaculture and fisheries entrepreneurship for tribal famers”	09 February, 2019	Jawhar Taluka, Palghar District, Maharashtra
Agricultural Summit- 2019	09-11 February, 2019	Motihari, Bihar
Krishi Mela	14-16 February, 2019	Arapanch, Sonarpur
Breehad Carrier Mela	15-16 February, 2019	Home Science College, Hoshangabad
CVI Agricultural Science Congress	20-23 February, 2019	ICAR-IARI, New Delhi
BLUECON 2019	26-28 February, 2019	CIDCO, Navi Mumbai
Versova Sea Food Festival	08-10 March, 2019	Versova Welfare School Ground, Mumbai
Exhibition iduring the Workshop on “ Genetic Improvement of <i>Clarias magur</i> Present Status and Future”	16 March, 2019	FWFF, Balabhadrapuram, ICAR-CIFE,
“Matsya Samridhi Mela” and 73 rd Foundation day, ICAR-CIFRI”	17 March, 2019	ICAR-CIFRI, Barrackpore



6.4. Tribal Sub Plan (TSP)

Programme Director: Dr. Gopal Krishna

Nodal Officers: Dr. Kiran Dube Rawat and Dr. K. A. Martin Xavier

Under the TSP component, ICAR-CIFE conducted several tribal community development activities in Maharashtra, West Bengal, Jharkhand, Nagaland, Arunachal Pradesh and Mizoram. In total, 14 training programmes were conducted during 2018-19, details of which are given below.

1. Awareness cum training programme on “Advances in Aquaculture” at Dimbhe Reservoir, Maharashtra

Coordinators: Dr. Kiran Dube Rawat, Dr. Paramita Banerjee Sawant & Dr. N. K. Chadha



The division of Aquaculture, ICAR-CIFE organized an awareness cum training programme on “Advances in Aquaculture” for tribal fisherfolk around Dimbhe reservoir and adjoining villages during 17-18 April, 2018. A total of 169 tribal men and women participants were trained in various topics related to the theme under the four broad areas namely i) advances in cage management for carps and ornamental fishes, ii) technical knowhow and advancement in carp culture technique in cages, iii) advances in ornamental fish

culture for livelihood security and iv) feed and feeding management for carps and ornamental fishes.

2. Training programme on “Integrated Aquaculture” at Ranchi, Jharkhand

Coordinators: Dr. G. H. Pailan & Dr. S. Dasgupta

A skill development training programme on Integrated Aquaculture was organized during 1-3 November, 2018 in Ranchi, Jharkhand. The programme was conducted by ICAR-CIFE Kolkata Centre in collaboration with the Directorate of Fisheries, Ranchi, Jharkhand. The training was attended by 51 participants belonging to tribal fisher folk from Ranchi district,



Jharkhand. Lectures were delivered on carp seed production, integrated fish farming, feed formulation & feeding strategies for fish farming, composite fish culture, culture of air-breathing fishes, common diseases and their control. The analysis of water quality parameters was demonstrated using the kits developed by ICAR-CIFE, Kolkata Centre. The field visit was conducted to discuss about the cage and pen farming of carp in the reservoirs.

3. Training programme on “Farm-Made Aqua-Feed Preparation and On-Farm Feeding Management” at Khunti, Jharkhand

Coordinators: Dr. Parimal Sardar, Dr. Sikendra Kumar & Mr. Dilip Kumar Singh

A two-day farmers' training on “Demonstration of Farm-made Aquafeed Preparation and On-farm Feeding Management” was organized by ICAR-CIFE, Mumbai in collaboration with State Fisheries Department, Jharkhand at District Fisheries Office, Khunti, Jharkhand during 2-3 November, 2018. A total of 76 farmers from tribal belt of Khunti district, Jharkhand attended the programme. Five lectures and



two hands-on-practical demonstrations were delivered during the training programme. Scientists demonstrated hands-on-practical to the trainees on aquafeed preparation and eco-friendly feeding strategies and analysis of water quality parameters using the kit.

4. Training programme on “Ornamental Fish Breeding and Culture” for women farmers of Sundarbans, West Bengal

Coordinators: Dr. B. K. Mahapatra & Dr. S. Datta r

Five days skill development training programme on “Ornamental Fish Breeding and Culture” was organized at ICAR-CIFE



Kolkata Centre during 24-28 November, 2018. Total 27 women from different parts of Sundarbans participated in the programme. The topics discussed in the training programme were identification of different exotic and indigenous ornamental fish, breeding and culture techniques of different ornamental fish, importance of artificial feed for ornamental fish culture and their role in colour enhancement,

importance of live food for ornamental fishes, water quality management for ornamental fish culture and breeding, quality improvement in ornamental fish, common ornamental fish diseases and their control measure, formulation and preparation of artificial feed for ornamental fish. Apart from class room lectures and practical demonstrations, field exposure visits were organized to Galiff Street ornamental fish market, Howrah ornamental fish market and ornamental fish farm at Howrah. r

5. Awareness programme on “Improved Technological Interventions in Fisheries for Livelihood Improvement of Tribal Fish Farmers” at Palghar, Maharashtra

Coordinators: Dr. K. A. Martin Xavier & Dr. K. K. Krishnani r

An awareness programme conceptualised by Dr. Gopal Krishna, Director was organised by Dr. K. K. Krishnani, Principal Scientist and Dr. K. A. Martin Xavier, Scientist at Deganchimet Village of Jawhar taluka of Palghar district on 14 December 2018. In this programme 51 tribal farmers participated. The program created awareness among tribal farmers about pond based IMC aquaculture, soil and water quality management, value addition, integrated agri-aquaculture and culture based fisheries in small water bodies as allied options for improving their livelihood and doubling their income. Existing farming systems were also assessed based on the discussion with the tribal farmers.

6. Awareness workshop on “Aquaculture technologies” for the farmers of Nandurbar district, Maharashtra

Coordinators: Dr. Kiran Dube Rawat & Dr. N. K. Chadha r

ICAR-CIFE in collaboration with Department of Fisheries, Govt of Maharashtra organised a one day awareness





programme on “Aquaculture Technologies” at Collector Office, Nandurbar, Maharashtra for the farmers of Nandurbar district on 15 December, 2018. In this programme, 170 tribal farmers from twenty five different villages viz Shelgada, Chickhodi, Khaurva, Manibeli, Khadaki, Natavad, Borpada, Nandurbar, Mubarpadi, Siyadampadvi, Vadgaon, Primpipada, Vadgaon Bhandarpada, Songeerpada, Vadchak, Lokhamal, Khardibhsya, Chimal khedi, Badagaon, Gaman, Shinduri, Dhankhedi, Dhadgaon, Molijar Shavda of Nandurbar district participated. This special programme for tribal people of was organized for the tribal people of Nandurbar under Tribal Sub Plan. r

7. Training programme on “Recent trends in Aquaculture” in Mamit, Mizoram

Coordinators: Dr. G. H. Pailan & Dr. S. Munilkumar r

A skill development training programme on “Recent Trends in Aquaculture” was organized during 23-25 January, 2019 in Mamit, Mizoram. The programme was organized in collaboration with Department of Fisheries, Government of Mizoram, Aizawl. The training was attended by 50 farmers and field level extension officials from different districts. Lectures on pond preparation and management, fish feed and feeding strategies, feed formulation, importance of farm made aqua feed,



utilization of locally available cheap feed ingredients to reduce the feed cost, importance of water quality monitoring and maintenance for suitable fish farming were delivered. Practical demonstration on water quality testing using the kits developed by ICAR-CIFE, Kolkata was conducted. A field visit was also organized to Darlak Village, near Mamit to demonstrate water testing kits to departmental staff as well as to fish farmers for good water quality management to improve fish productivity. r

8. Training program on “Cage Aquaculture” for the women farmers of Nandurbar district, Maharashtra

Coordinators: Dr. Kiran Dube Rawat & Dr. Paramita Banerjee Sawant r

ICAR-Central Institute of Fisheries Education, organised a three days training programme on “Cage Aquaculture” at ICAR



– CIFE, Mumbai for the women fish farmers of Nandurbar district, Maharashtra from 31st January to 2 February, 2019. A group of 18 women tribal fish farmers from different villages i.e. Navapor, Dhadgaon and Toranmal of Nandurbar district participated in the programme. In this programme, several aspects of cage culture such as site selection, cage structure, construction and installation of cages and species selection were explained and demonstrated. A field exposure visit to Dimbhe Reservoir was also organised for the participants to understand cage fish farming.

9. Training on “Value Added Fish Products Preparation” in Palghar District, Maharashtra

Coordinator: Dr. Amjad Balange r

A two-day training programme on “Value



added fish products preparation” was conducted at Lohope Village, Wada Taluka, Palghar District during 12-13 February, 2019 under Tribal Sub-Plan activity (TSP). Total 54 participants (25 women and 29 men) benefitted from the programme. The participants were trained in hygienic handling of fish immediately after harvesting, separating the rohu fish mince by cooking method and removing shell from the prawn meat. Prawn pickle, fish sev, fish chakli and fish papad were prepared and hands-on training was given to the participants. r

10. Training programme on “Integrated Aquaculture” in Chandel, Manipur

Coordinators: Dr. S. Munilkumar & Dr. Sujata Sahoo r

A three-day skill development training programme for fish farmers of Chandel district was organised by ICAR-CIFE, Kolkata Centre in collaboration with Fisheries Department, Govt of Manipur during 22-24 February, 2019 in district level



fish seed farm at Komlathabi, Chandel district. During the training period, scientists interacted with various aspects of recent fish farming trends, composite fish culture, integrated fish farming, nursery management, water quality testing and health management etc. The programme concluded with a field visit to Hiyangthang fish farm. r

11. Training program on “Freshwater Pearl Culture” for the women fish farmers of Dimbhe reservoir, Maharashtra

Coordinator: Dr. Kiran Dube Rawat r

Under TSP, a training program was organized for the tribal women of Dimbhe reservoir on “Fresh water pearl culture”



during 26-28 February, 2019. The training was conducted at Dimbhe reservoir and a total of 25 women participated in the training. They were given hands-on training on morphology and anatomy of mussels, implantation procedure, intensive care of implanted mussels, rearing them in ponds and other water body.

12. Skill Development Training programme on Integrated Aquaculture in Kiphire, Nagaland

Coordinators: Dr. Sujata Sahoo & Dr. B. K. Mahapatra r

A skill development training programme on Integrated Aquaculture was organized during 28 February-2 March, 2019 in Kiphire, Nagaland in collaboration with



Directorate of Fisheries, Kohima, Nagaland. The training was attended by 56 participants belongs to tribal fishers folk from Kiphire district, Nagaland. The lectures were given on the pond preparation and management in aquaculture practices, composite fish culture and importance of water quality monitoring in aquaculture and integrated aquaculture and livestock cum fish culture. The lecture was also delivered on the on common fish diseases and their control measures. r

13. Awareness programme on “Interaction with tribal fishermen community for livelihoods improvements through intervention in fisheries” at Nandurbar district, Maharashtra

Coordinators: Dr. Geetanjali Deshmukhe, Dr. K. A. Martin Xavier & Mr. Karan Ramteke r

A one-day awareness programme on Interaction with tribal fishermen community for livelihoods improvements through intervention in fisheries” was conducted at Nandurbar on 7 March, 2019. Total 71 fishfarmers (25 women and 46 men) from different villages (Navapur, Raiangann, Toranamal, Chinchkhedi, and Nandurbar) of Nandurbar district attended the training. The information of economically important freshwater fruit aquatic plants such as *Trapa* (edible plant)



and Brahmi (medicinal plant) was given to the participants. Lectures were also delivered on the value addition of fresh water fishes for better livelihood options to the participants. r

14. Table size fish culture of IMC in floating net cages in Dimbhe Reservoir, Maharashtra

Coordinator: Dr. Kiran Dube Rawat r

This long-term activity was planned with the objective of optimizing the stocking density and feeding ration for rearing of stunted *Labeo rohita* (Hamilton, 1822) in cages. Culture of fingerlings of *Labeo rohita* r in floating net cages was done in the Dimbe Reservoir, Maharashtra for a period of 11 months. Fingerlings of *Labeo rohita* of having average weight $38.23 \pm 91g$ and length 14.2-15.10 cm were used for stocking. There were 4 stocking densities i.e., 10, 15, 20 and 25/m² with different feeding rations 3%, 4%, 5% and 6% of body weight throughout the culture . The stocking density 10/m² and with feeding ration 5% body shown the highest growth



of 734.76 g in 11 months of culture period. r

6.5. Programmes under North-Eastern Hill States

Programme Director: Dr. Gopal Krishna r

Nodal Officer : Dr. P. P. Srivastava r

Under the NEH programmes, two training programmes were conducted at Nagaland r

1. Training Programme on “Promoting Higher Fisheries Education in North Eastern Hilly Region

Coordinator: Dr. P. P. Srivastava and Dr. Rama Sharma r

ICAR-CIFE organized a one-day programme on “**Promoting Higher Fisheries Education in North Eastern Hilly Region**” on 6 March, 2019 at Fisheries Biologist Brooder Fish Farm, Dimapur, Nagaland under Department of Fisheries and Aquatic Resources, Nagaland. A total 40 participants took part during deliberations. Mr. M. K. Mero, Horticulture Secretary, Nagaland addressed the gathering. r



2. Awareness-cum-Hands on Training on “Fish Health Management” at Dimapur, Nagaland

Coordinator: Dr. Megha Badekar and Dr. P. P. Srivastava r

A two-days programme conducted on Awareness-cum-Hands-on-Training on “**Fish Health Management**” at Fisheries Biologist Brooder Fish Farm, Dimapur, Nagaland under Department of Fisheries and Aquatic Resources, Nagaland during 6-7 March, 2019. Seventy two fish farmers, Fisheries Technical, entrepreneurs, & District Fisheries Development Officers had actively participated in awareness and hands-on training programme. Mr. M. K. Mero, Horticulture Secretary, Nagaland and Mr. Kevisa Kense, Director Fisheries, Nagaland addressed the gathering. r



6.6. Fishery Advisory Services/Consultancy etc.

Technical guidance was provided to the farmers in the states of Haryana, Punjab, Rajasthan, Delhi and U.P. on various aspects of fish and shrimp farming.

6.7. Print media

S.No.	Title	News paper	Date
1.	Berajale Ilish chhana Mere Khoyra Naame Bikri r	Ananda Bazar Patrika	04 July 2018 r
2.	Ghorei Royechhe Tabu Rangin Maachhe Paranirbhasil Rajya r	Ei Samay	21 July, 2018 r
3.	Bidese Barchhe Chahida- Rangin Maachh Chase Mahilader Sanirbhar Gosthi r	Bartaman Patrika	25 July, 2018 r
4.	Macchli Palakon Ka Panch Dino Ka Prshikshan Shuru	Hindustan, Ranchi, Jharkhand	02 November, 2018
5.	Samekit jal krishi par Prashikshan Ka Ayojan	Prabhat Khabar, Ranchi, Jharkhand	02 November, 2018
6.	Rangin Maachh- Hobby to Businesser	Samvad Pratidin	29 November, 2018
7.	Recirculating Aquaculture Maachher Sange Kora Jaay Nikhorchay Sabji Chhash r	Feere Asuk Sabuj	29 November, 2018 r
8.	Aab Fish Se Bane Cutlet Aur Achar Ka Log Le Sakege Maja	Dainik Bhaskar, Hoshangabad Itarsi (Ed.), MP r	06 January, 2019 r
9.	Aab Fish Se Bane Cutlet Aur Achar Ka Log Le Sakege Maja	Dainik Bhaskar, Hoshangabad Itarsi (Ed.), MP	06 January, 2019
10.	Machali Palne Vale Kisan Amdani Badhane Ab Bana Sakege Fish Cutlet	Dainik Bhaskar, Hoshangabad Itarsi (Ed.), MP r	07 January, 2019 r
		Patrika, Itarsi (Ed.), MP	07 January, 2019



6.8. Visits Coordinated

ICAR-CIFE, Mumbai

Date	Organization / University / College / Category of Visitors	No. of Visitors
05 April, 2018	Kerala University of Fisheries & Ocean Studies (KUFOS), Cochin	48 r
24 April, 2018	Dept. of Life Science, Mumbai University	21 r
23 June, 2018	Trainee Scientists from Nepal Agricultural Research Council	02
05 July, 2018	B.P.S Agricultural College, Purnea, BAU, Sabour	30 r
18 July, 2018	Basant Montessori School, Mumbai	45 r
26 July, 2018	Labour Institute of Mumbai, Elphinstone Road, Mumbai	28 r
28 July, 2018	Basant Montessori School, The Theosophical Colony, Mumbai	31 r
02 August, 2018	Ramnarain Ruia Autonomous College, Matunga, Mumbai	30 r
17 September, 2018	College of Agricultural Information Technology Anand Agricultural University, Anand, Gujarat	25 r
21 September, 2018	GKVK College of Agriculture, Bangalore	50 r
13 November, 2018	Veterinary College Hassan, Karnataka Veterinary, Animal & Fisheries Science University, Bidar r	37 r
17 November, 2018	BFSc Students of College of Fisheries, Mangalore	50 r
19 November, 2018	College of Fisheries, Kankanady, Mangaluru, Karnataka	33 r
22 November, 2018	College of Fisheries Assam Agricultural University, Raha	24 r
30 November, 2018	Tamil Nadu Agricultural University, Forest College and Research Institute, Mettupalayam	21 r
10-12 December, 2018	Faculties of Marine Science, Annamalai University	43 r
28-29 December, 2018	College of Agricultural Engineering & Post Harvest Technology, Central Agricultural University, Ranopool, Sikkim r	43 r
05 January, 2019	Mithibhai College, Mumbai–MBA Students of Social Entrepreneurship at the School of Business Management, NMIMS r	15 r
14 January, 2019	College of Fisheries, Odisha University of Agriculture and Technology, Rangailunda, Bhubaneswar, Odisha r	34 r
05 February, 2019	Chhattisgarh Kamdhenu Vishwavidyalaya, College of Fisheries, Kawartha (Kabirdham), Chhattisgarh r	25 r
15 February, 2019	AQSA Womens Degree College, Nizampur, Chavindra, Bhivandi	100 r
11 March, 2019	Alva Centre for Post-Graduate Studies & Research, Sundarbananda Alva Campus, Vidyagiri, Moodubidire Dakshina, Kannada, Karnataka r	13 r
16-19 March, 2019	College of Fisheries, Central Agricultural University, Lambuchera, Tripura r	26 r

ICAR-CIFE, Kolkata Centre

Date	Organization / University / College / Category of Visitors	No. of Visitors
01-02 June, 2018	Exposure-cum-Training Programme for farmers from Manipur	28
14 June, 2018	Exposure Visit Programme for fish farmers from Sunderban	24
16 June, 2018	Exposure Visit Programme of B.Sc. Agri. (Hons.) Students, BHU, Varanasi, Uttar Pradesh	24
03-05 July, 2018	Exposure-cum-Training Programme on Recirculatory System in Aquaculture for State Govt. Officials from Sikkim	02
10-12 July, 2018	Exposure Visit Programme for first year students of IFTC, Govt. of Manipur	26
15-18 July, 2018	Exposure Visit-cum-Educational Tour for 3 rd year students of College of Fishery Science, Andhra Pradesh	23
04 August, 2018	Exposure Visit Programme for Ramkrishna Seva Pratisthan, Narendrapur	39
07 August, 2018	Exposure Visit Programme for M.Sc. Zoology 3 rd semester students from Ashutosh College, Kolkata, West Bengal	16
10 September, 2018	Exposure Visit Programme of fish farmers from Gosaba, Kumirmari	24
26 September, 2018	Exposure Visit Programme of fish farmers from Upper Shilong, Meghalaya	30
05-06 October, 2018	Exposure Visit Programme of students from Department of Zoology, Barkatullah University, Bhopal	02
11 October, 2018	Exposure Visit Programme for TOT Officers from ICAR-CIFRI, Barrackpore	19
22–24 November, 2018	Exposure Visit Programme of students from Fishery College & Research Institute of Tuthikodi, Tamil Nadu	35 r
02–04 December, 2018	Exposure Visit Programme of BFSc 3 rd year students from College of Fisheries, Ratnagiri, Maharashtra	29 r
15 December, 2018	Exposure Visit Programme 3 rd year B.Sc fishery students from St. Anthony College, Shillong, Meghalaya	17 r
18 December, 2018	Exposure Visit Programme of fish farmers from Panagudi, Nagapattinam, Tamilnadu	15 r
20 December, 2018	Exposure Visit Programme of State Fisheries Officers from Kerala State Fishery Department	07 r
24 December, 2018	Exposure Visit Programme of students from Bidhan Chandra College, Asansol	06 r
8 January, 2019	Exposure Visit Programme for BFSc 4 th year students from College of Fisheries, GADVASU, Punjab	15 r
9 January, 2019	Exposure Visit Programme for BFSc 4 th year students from College of Fisheries, Lembuchera, Tripura	26 r
9 January, 2019	Exposure Visit Programme for BFSc final year students from WBUAFS, Chagaria, West Bengal	20
11 February, 2019	Exposure Visit Programme of students from College of Food Technology, Kerala	20 r

6 March, 2019	Exposure Visit Programme of trainees from Tripura Fisheries Training Institute, Tripura r	25 r
13 March, 2019	Exposure Visit Programme of students from WBUAFS, Kolkata	31 r

ICAR-CIFE, Kakkinada Centre

Date	Organization / University / College / Category of Visitors	No. of Visitors
04 July, 2018	Exposure visit of SIFT State Fisheries trainees, Andhra Pradesh	12
10 August, 2018	Exposure visit of B.Sc. Zoology students from Nova Degree College Vegavaram, West Godavari District, Andhra Pradesh	36
24 October, 2018	Visit of Dr. C. Suvarna, Commissioner of Fisheries and Managing Director, TSFCOF, Telangana	05
14 December, 2018	Exposure visit of M.Sc. students from Department of Marine Living Resources Andhra University, Visakhapatnam	42
04 January, 2019	Exposure visit of M.Sc. students from Adikabi Nannaya University, Rajamahendravaram, Andhra Pradesh	57
10 January, 2019	Exposure visit of B.Sc. and M.Sc. Zoology Students From S. K. R. College for Women, Rajamahendravaram, Andhra Pradesh	40
12 March, 2019	Exposure visit of SIFT State Fisheries trainees, Andhra Pradesh	28
20 March, 2019	Exposure visit of SIFT State Fisheries fisherman trainees, Andhra Pradesh	50
26 March, 2019	Exposure visit of SIFT State Fisheries trainees, Andhra Pradesh	46

ICAR-CIFE, Rohtak Centre

05 April, 2018	B.Sc. students, Department of Zoology, Indira Gandhi University, Meerpur, Rewari District, Haryana r	25
04 October, 2018	B.Sc. 3 rd year students, Prarambh School for Teacher Education, Jhajjar District, Haryana r	31 r
05 October, 2018	Students from D.R.K. Adarsh Vidya Mandir, Bhiwani District, Haryana r	35 r
15 October, 2018	B.Sc. Medical (5 th Semester) students, Suraj (PG) Degree College, Mahendergarh District, Haryana r	40 r
25 October, 2018	B.Sc. Medical (3 rd Medical Semester), Vaish College, Biwani District, Haryana r	25 r
14-16 February, 2019	PGDIF & AM, ICAR-CIFE, Kolkata	07 r

6.9. Transfer/Demonstration of Technology

Name of the technology : ***L. vannamei* culture in salt affected Inland Saline Water**

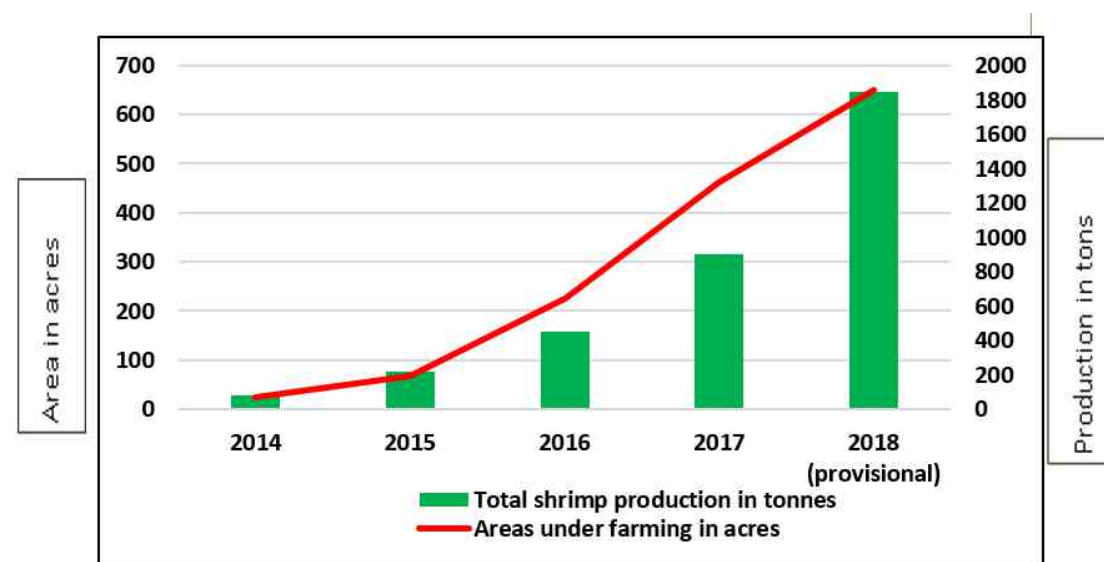
Demonstrated in : Haryana, Punjab, Rajasthan, Western UP region

Beneficiaries : Farmers & stakeholders

Impact : Intensive technology demonstrations and trainings were given to farmers in the three extensively salt-affected states of Haryana, Punjab and Rajasthan in collaboration with their respective State Fisheries Departments. In addition, continual technical guidance and monitoring of each farm by ICAR-CIFE throughout the culture period gave enough confidence to farmers and the lure of big profit resulted in widespread adoption of shrimp farming by 2018. So far, the technology has been adopted by 212 farmers in Haryana, 80 farmers in Punjab, 7 farmers in Rajasthan and 2 in New Delhi, spreading over almost 1000 acres with an average productivity of around 2.2 tonne/acre. The wide spread adoption of the technology by farmers resulted in the huge production of *L. vannamei* over the years, generating in the cumulative revenue of around 200 crores r

District wise details of commercial inland saline shrimp farms demonstrated by ICAR-CIFE Rohtak Centre in 2018 r

State	Major districts covered
Haryana	Rohtak, Jhajjar, Bhiwani, Jind, Hisar, Fatehabad, Sirsa, Sonapat, Mewat, Gurugram, Charki Dadri, Rewari
Delhi	South West Delhi
Punjab	Sri Muktsar Sahib, Fazilka, Batinda, Mansa, Faridkot
Rajasthan	Churu, Hanumangarh



Shrimp farming is gaining popularity very fast in salt affected inland saline soil.

Name of the technology : Cage culture for rearing carp fingerlings

Demonstrated in : Nandurbar, Dimbhe, Maharashtra r

Beneficiaries : Tribal farmers r

Impact : Fishers of Dimbhe are regularly stocking the reservoir with >100 mm carp fingerling, therefore earlier they were able to catch <1 KG fish but now they are able to catch 5 to 8 Kg of fish. r

Name of the technology : Water Testing Kit

Demonstrated in : West Bengal, Bihar, Jharkhand, Manipur, Nagaland, Mizoram, Arunachal Pradesh,

Beneficiaries : Fish Farmers r

Impact : The water testing kits were demonstrated at ICAR-CIFE Kolkata centre in presence of Scientists, Technical officers, Research Scholars, Students & Trainees and few state fisheries officers of M.P., Punjab, Haryana, and some high level fisheries officers from Kerala in the on 20th December, 2018. The water testing kits were also demonstrated to the trainees in different on and off campus training and field demonstration programmes. The 7 sets of kit can analyse 15 parameters with a total cost of production is about Rs 1750 at Institute level. There is a great demand of these kits among the farmers and they are procuring the kits from the Centre on regular basis. r



Name of the technology : Development of commercial biofloc unit and biofloc based culture of common carp and Pangasius

Demonstrated in : Vidyapatinagar Dalsing Sarai and Peedhouli, Tenggura

Beneficiaries : More than 200 farmers and entrepreneurs

Impact : ICAR CIFE Motipur Center has successfully demonstrated the culture of species like Pangassius, Magur, Common carp in biofloc system in cemented and tarpoline tank of 10,000 to 20,000 L with production rate of 12 to 25 kg/m³

: Biofloc based culture is being adopted by farmers widely Commercial unit of cemented tanks demonstrated at Vidyapatinagar Dalsing Sarai Samastipur, Bihar Commercial unit of Tarpoline tanks demonstrated at Peedhouli Tenggura Begusarai, Bihar.





Awards & Honours



Honours and Awards

- Dr K. K. Krishnani, Principal Scientist received **Biennium Recognition Award** from National Academy of Agricultural Sciences (NAAS) for his significant



contributions in the field of development of monitoring tools and mitigation technologies for priority stresses in aquaculture on 20 February 2019 at NASC, New Delhi. r

- Dr. B. K. Mahapatra, Principal Scientist received **Mother Teresa (Bharat Ratna) Gold Medal Award** from Global Economic Progress & Research Association, New Delhi at Chennai for outstanding individual achievement in education and research on 23 June, 2018.
- Dr. K. Pani Prasad, Principal Scientist received **Best Faculty-2018** for major contribution in teaching, research and extension in fisheries and aquaculture by Journal of Fisheries and Life Sciences, 2018 at College of Fisheries, Mangaluru, Karnataka, India.
- Dr. Shivaji Argade received the Certificate for **Best Extension Research** for gender transformative agricultural extension system during the International Extension Congress, organized by ICAR during 1-3 February, 2018. r
- Dr. Shashi Bhushan, Scientist received the **Best Young Scientist Award** by Kalash Research and Welfare Society, during National Symposium on "Global Warming vs. Biodiversity and Society-2019, Prayagraj, Uttar Pradesh on 25 February 2019.

- Dr. A. K. Verma, Senior Scientist received **Best Scientist Award** for outstanding contribution to research and community by the River Water User Association (India) on the occasion of 5th National conference on River Basins Sustainability: Water Scarcity Agricultural Production, Climate Change and Natural Disasters on 17-18 November, 2018 at Allahabad.
- Dr. Mukunda Gowswami was awarded the **Fellowship of Zoological Society of**



India during the 31st All India Zoology Congress during 15-16 January, 2019 at CAU, Tripura. r

- Shri. V. Harikrishna was appointed as the **Member of Technical Committee** for the execution of Rashtriya Krishi Vikas Yojana Scheme regarding the promotion of fish and shrimp farming in water logged and saline affected lands of Haryana and Punjab.

Letter of Appreciations

- Director CIFE, Mumbai was awarded an 'Appreciation Letter' by Dr. Madan Mohan, Director & Warden of Fisheries, Government of Punjab for commendable work carried out in Punjab.
- Director CIFE, Mumbai was bestowed with an 'Award of Appreciation' at the Agri-Tech Summit 2018 by the Managing Director, Nav Bharat, Pune.
- Director CIFE, Mumbai was conferred a 'Certificate of Appreciation' at an International Conference organized by the College of Fisheries, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth,

Dapoli and Interdisciplinary Society for Advancement of Agricultural Sciences and Technology during 17-20 January 2019. r

- ICAR-CIFE, Mumbai received 'Appreciation Letter' for conducting training programme for tribal fisher folk of Khunti district, Jharkhand from the Directorate of Fisheries, Jharkhand. r
- ICAR-CIFE Regional Centre, Kolkata received 'Appreciation Letter' for training programme on Integrated Aquaculture in Dhurva, Ranchi from the Directorate of Fisheries, Jharkhand. r
- ICAR-CIFE Regional Centre, Rohtak received 'Appreciation Letter' for enhancement of shrimp (*Litopenaeus vannamei*) production and its technology in Punjab from Dr. Madan Mohan, Director and Warden of Fisheries, Punjab r
- Dr. Parimal Sardar, Principal Scientist received an 'Appreciation Letter' for conducting SDP on "Preparation of Farm-made Feed and on Farm Feeding Management" under TSP by Director of Fisheries, Jharkhand, Ranchi on 3 November, 2018 at Khunti, Jharkhand.
- Dr. Arpita Sharma, Principal Scientist received Samman Chinh and an 'Appreciation award' by Vesava Koli Machhimar Society, Mumbai during Vesava Koli Sea food festival at Versova fishing village, Mumbai on 18 January, 2019 and 8 March, 2019
- Dr. Vidya Shree Bharti, Scientist received an 'Appreciation letter' by Kartavayavan Mahilancha Shivsena Goregaon Mahila Aadhad during Jagtik Mahila Din on 8 March 2019 at Sardar Patel Sabhagriya, Goregaon, Mumbai
- Dr. Vidya Shree Bharti, Scientist received an 'Appreciation letter' for best presentation from Institute of Electrical and Electronics Engineers (IEEE)-GRASS event at Don Bosco Institute of Technology, Kurla on 11 January, 2019

Best Oral/Paper/Poster Awards

- Dr. Neha W. Qureshi, Scientist received the Dr. Anamitra Saha Award for Best Paper organized by Indian Society of Agricultural Economics during 78th Annual Conference of Indian Society of Economics at International Food Policy Research Institute NASC, New Delhi on 3 November, 2019. r
- Dr. K. Pani Prasad, Principal Scientist was received the 'Best Paper Award' by National Science Foundation (NSF), Tamil Nadu
- Dr. Rupam Sharma, Principal Scientist received the Best Research Paper Award conferred by Nirmala Krishna Memorial Social Trust, Dr. Balasaheb Konkan Krishi Vidyapeeth, Dapoli
- Dr. Paramita Banerjee Sawant, Senior Scientist received the Best Oral Presentation Award for her paper



during World Brackishwater Conference, BRAQCON, 2019 organized by Society of Coastal Aquaculture and Fisheries (SCAFi) and ICAR- Central Institute of Brackishwater Aquaculture (ICAR-CIBA) on 25 January, 2019 at ICAR-CIBA, Chennai. r

- Dr. Sujata Sahoo, Scientist received the Best paper award for Oral presentation during Indian Society of Extension Education, National Seminar-2018 at West Bengal University of Animal & Fishery Sciences, Belgachia, Kolkata, West Bengal on 5 December 2018.

- Dr. Mujahid K. Pathan, Scientist received the Best poster award



conferred by Indian Society of Genetics and Plant Breeding at the First National Genetics Congress held at The Indian Agricultural Research Institute, New Delhi on 14-16 December, 2018 r

DARE, Government of India for conducting training courses for year 2018, organised by Egyptian International Centre for Agriculture & Reclamation of the Government of Arab Republic of Egypt for Fish Culture and Development.

- Dr. Sunil Kumar Nayak, Scientist, ICAR-CIFE Powarkheda Centre was nominated in the expert panel of Indo-European Chamber of Commerce & Industry (IECCI) as the Nodal Training Institute of MANAGE Hyderabad for Agri-Clinic and Agri-Business Centre Scheme (ACABC) for Madhya Pradesh and Diploma in Agriculture Extension Services for Input Dealers (DAESI) for Bhopal, M.P.
- Dr. K. Pani Prasad, Principal Scientist selected as member of the Technical Group of Ministry of Animal Husbandry, Dairying and Fisheries (DAHDF), New Delhi for post-import quarantine of ornamental fish.

Other Recognitions

- Dr. Sunil Kumar Nayak, Scientist, ICAR-CIFE Powarkheda Centre was nominated by Ministry of Agriculture,

Institutional awards

Sl. No.	Category	Awardee
1	Best Scientist	Dr. Megha Bedekar r
2	Best Young Faculty	Ms. Shamna, N r
3	Best Teacher	Dr. K. Pani Prasad r
4	Best Extension Scientist/Worker	Dr. Md. Aklakur r
5	Best Young Scientist for field oriented work	Dr. Thongum Ibemcha Chanu r
6	Best Division/Centre	FNBP & Kakinada centre r
7	Best Technical Staff	Mr. Lavesk Kumar r
8	Best Administrative Staff	Mrs. Anu Grover r
9	Award for Institutional Building	Dr. Gayatri Tripathi r
10	Award for Patent/IPR/Technology Generation	Dr. Md. Aklakur r
11	Award for Best Publication of the year (Highest Impact Factor)	Dr. K.A. Martin Xavier r
12	Best Supporting Staff	Mr. Bandu Rajaram Chavan r Mr. Arvind Mahadev Lavande r
13	Award for overall Best M.F.Sc. Dissertation	Mr. Rahul Krishnan r
14	Award overall Best Ph.D. Thesis	Dr. Anutosh Paria r
15	Best school going child XII class	Mr. Srinivas Chandrakant Hittinahalli r
16	Best school going child X class	Ms. Vaishnavi Deo r



Dr. Megha Bedekar



Ms. Shamna, N



Dr K. Pani Prasad



Dr. Md. Aklakur r



Dr. Thongum I. Chanu



Fish Nutrition, Biochemistry and Physiology



CIFE Kakinada Centre r



Mr. Lavesh Kumar



Mrs. Anu Grover



Dr. Gayatri Tripathi r



Dr. K.A. Martin Xavier



Mr. Bandu Rajaram Chavan



Mr. Arvind Mahadev Lavande r



Mr. Rahul Krishnan



Dr. Anutosh Paria



Mr. Srinivas C. Hittinahalli



Ms. Vaishnavi Deo r

Letter of Appreciation from Director

The following staff of CIFE received “Letters of Appreciation” from Director for their significant contributions to institutional activities.



Dr. Rama Sharma



Dr. Swadesh Prakash



Mr. S. S. Kamat



Mrs. Poonam N. Behl



Mr. R. R. Kadam



Mr. B.G. Mandhare

ICAR-Sports

ICAR-CIFE, Mumbai participated in the ICAR West Zone Sports Tournament-2018 organised by ICAR-Indian Grassland and Fodder Research Institute, Jhansi U.P. during October 5-8, 2018 and won the following prizes

ICAR-CIFE, Mumbai
Highest Number of Gold Medals in West Zone : 7

Dr. Jeena K.	Best Women Athlete	
Dr. Jeena K.	Gold medal	100 meters
Dr. Jeena K.	Gold medal	200 meters
Dr. Jeena K.	Gold medal	Discus throw
Dr. Jeena K.	Gold medal	Javelin throw
Dr. Jeena K.	Gold medal	Shot put
Dr. Jeena K.	Silver medal	Long jump
Dr. Nalini Poojary	Gold medal	High jump
Dr. Megha Bedekar	Silver medal	Badminton singles
Dr. Megha Bedekar and Dr. Nalini Poojary	Gold medal	Badminton doubles
Ms. Chandarekha Khundol and Ms. Fransica Fernandes	Silver medal	Table tennis doubles
Ms. Chandarekha Khundol	Silver medal	Table tennis single
Ms. Revati Dhongde	Silver medal	Chess
Mr. Satyendar Singh	Bronze medal	Discus throw





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

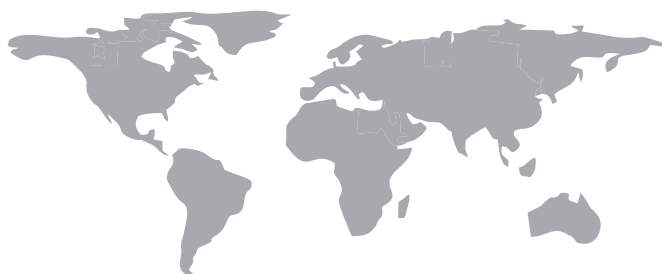
- Fishery Survey of India, Mumbai
- Central Institute of Fisheries Nautical and Engineering Training, Kochi
- Marine Products Export Development Authority, Kochi
- Zoological Survey of India, Kolkata
- Indian Institute of Technology, Kharagpur
- Department of Earth Sciences, New Delhi
- Department of 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

- Central Marine Fisheries Research Institute, Kochi
- Central Institute of Brackishwater Aquaculture, Chennai
- Central Institute of Freshwater Aquaculture, Bhubaneswar
- Central Inland Fisheries Research Institute, Barrackpore
- Central Institute of Fisheries Technology, Kochi
- National Bureau of Fish Genetics Resources, Lucknow
- Directorate of Coldwater Fisheries Research, Bhimtal
- 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
- ICAR- The Indian Institute of Soil Science, Bhopal

International

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



State Governments

State Department of Fisheries: Maharashtra, Haryana, Uttar Pradesh, Bihar, Tamil Nadu, Andhra Pradesh, Tripura, Arunachal Pradesh, Madhya Pradesh, Meghalaya, Nagaland, Assam, Manipur, Mizoram, Sikkim, Punjab and Telangana

Universities

- Cochin University of Science and Technology, Kochi
- Annamalai University, Chidambaram
- Adikavi Nannaya University, Rajahmundry
- University of Goa, Goa
- 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 Chandra Krishi Viswa Vidyalaya, Nadia, West Bengal
- Kalyani University, Kalyani, West Bengal
- Barkatullah University, Bhopal
- Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur
- Chhattisgarh Kamdhenu Vishwa Vidyalya, Chhattisgarh
- Babasaheb Bhimrao Ambedkar University, Lucknow
- Central of Agriculture University, Imphal
- Sri Venkateswara Veterinary University, Kakinada, Andhra Pradesh

CSIR Institutes

- Industrial Toxicology Research Centre, Lucknow
- 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
- National Botanical Research Institute, Lucknow
- Institute of Genomics and Integrative Biology, New Delhi
- Indian Institute of Integrative Medicine, Jammu
- Indian Institute of Chemical Biology, Kolkata

NGOs:

- Shashwat, Manchar, Pune, Maharashtra
- Yusuf Meherally Centre, Kutch, Gujarat
- United Artists' Association, Ganjam, Orissa
- Friends of Nature Association, Talegaon, Maharashtra
- NGO Pradhan, Juman, Itarsi
- NGO, IECCI (Indo-European Chamber of Commerce & Industry)

Other Organizations

- Haryana Kisan 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
- Shrimpo 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 Machhimar Kruti Samiti, Mumbai
- Akhil Bhartiya Machhimar Sanghatan, Mumbai
- Madhya Pradesh Fish Federation
- Saguna Baugh Farm, Neral, Maharashtra
- Tata Power Co. Mahseer Farm, Lonavla, Maharashtra
- Govt. Fish Farm, Khopoli, Maharashtra
- Arrey Fish Farm, Mumbai, Maharashtra
- Shramajivi Janata Sahayyak Mandal, Mahad, Raigarh, Maharashtra
- Agriculture Technology Management Agency (ATMA), East Godavari

- Reliance Foundation Ltd. United Nations Development Programme, Ramanayyapeta, Kakinada
- National Centre for Sustainable Aquaculture, Gaigolupadu, Kakinada
- The Marine Products Export Development Authority, Zonal Agriculture Research Station, Hoshangabad
- Agriculture Department, Hoshangabad

MoUs signed during 2018-19

CIFE has signed MoUs with the following universities and organizations to enhance collaboration in fisheries research and academics.

Indian Universities

1. Maharashtra Animal and Fishery Science University, Nagpur, Maharashtra (renewed on 10 April, 2018)
2. Chhattisgarh Kamdhenu Vishwavidyalaya, Raipur, Chhattisgarh (renewed on 25.06.2018)
3. Kamdhenu University, Gandhi Nagar, Gujarat (renewed on 16.02.2019)

Governmental Institutions

- Institute of Pesticides Formulation Technology, Department of Chemicals and Petrochemicals, Sector 20, Udyog Vihar, Gurugram, Haryana (25 January, 2019)

Private Organizations

- Institute of Livelihood Research and Training, Hyderabad (06.04.2018)



MoU signed with Institute of Livelihood Research and Training, Hyderabad



Publications



7.1. Peer Reviewed Publications

- Acharya AP, Pavan-Kumar A, Gireesh-Babu P, Joshi CG, Chaudhari A, Krishna G (2019) Population genetics of Indian giant river-catfish, *Sperata seenghala* (Sykes, 1839) using microsatellite markers. *Aquatic Living Resources* 32(4): 43-48.
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7.5. Training Manuals

7.5.1. English

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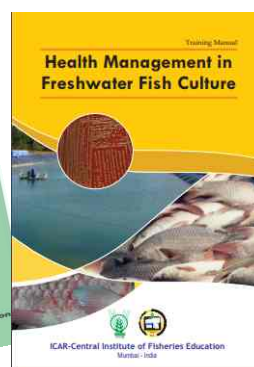
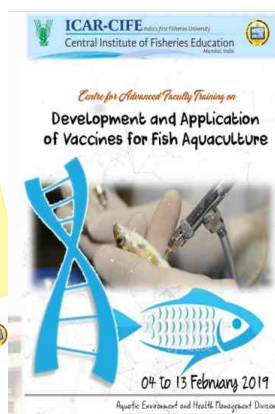
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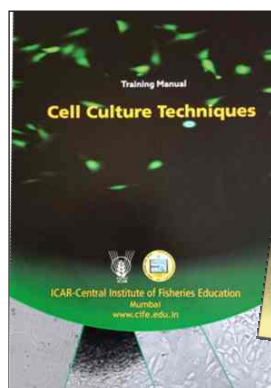
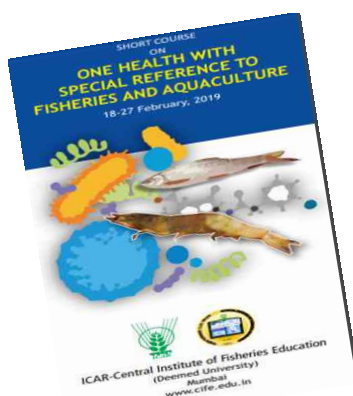
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Design and Construction of a Model Ornamental Fish Hatchery and Rearing Unit (2019) ICAR-Central Institute of Fisheries Education, Mumbai. 4pp. r

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Development of Energy Efficient and Environment Protective Aquaculture Technologies for Degraded Soils (2018) ICAR-Central Institute of Fisheries Education, Mumbai. 4pp. r

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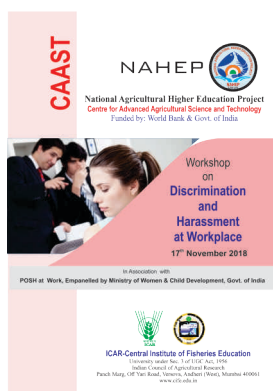
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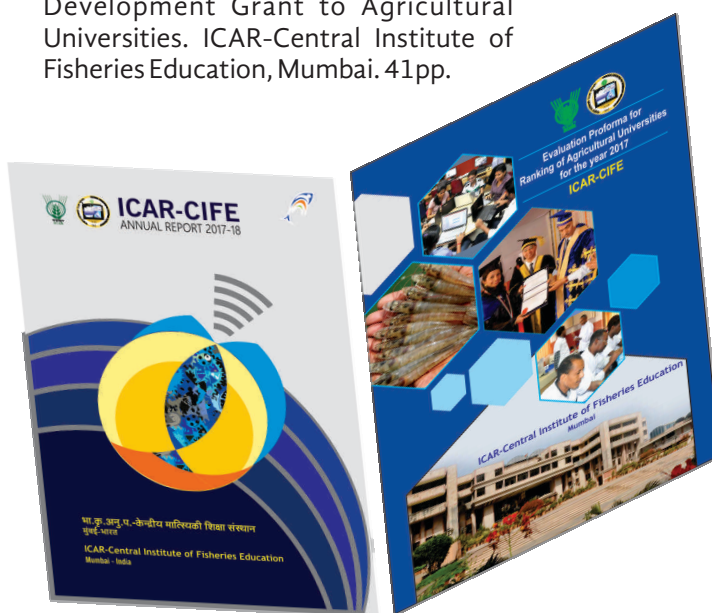
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10

Participation in Workshops/ Conferences/ Symposia/ Meetings/ Farmers' Meet





10. Participation in Workshops/Conferences/Symposia/Meetings /Farmers' meet etc.

10.1 Participated by Dr. Gopal Krishna, Director & Vice-Chancellor, ICAR-CIFE, Mumbai

Sno.	Name of the Programme	Venue	Date	Organized by
1.	Agriculture Fair	Motihari, Bihar	13-15 April, 2018	Department of Agriculture, Government of Bihar
2.	ERP System in ICAR	ICAR, Krishi Bhawan, New Delhi	28 June, 2018	Secretary ICAR, New Delhi
3.	Swaraj to Surajya: National Consultation on Making Agriculture Sustainable and Profitable	Pune, Maharashtra	26 July, 2018	Vaikunth Mehta National Institute of Cooperative Movement (VAMICOM), Pune
4.	National Conference of Vice-Chancellors & Directors on Research Innovation in Higher Education	Ashoka Hotel, New Delhi	27 July, 2018	University Grants Commission (UGC), New Delhi
5.	Directors' Meet	Fisheries Division, ICAR, KAB II, New Delhi	19-20 August, 2018	DDG (Fy.) ICAR, New Delhi
6.	Directors' Meet	Fisheries Division, ICAR, KAB II, New Delhi	29 August, 2018	DDG (Fy.) ICAR, New Delhi
7.	Meeting with Chairman, ASRB	KAB I, Pusa, New Delhi	30 August, 2018	Chairman, ASRB, New Delhi
8.	Meeting with DDG (Fy.)	Fisheries Division, ICAR, KAB II, New Delhi	01 October, 2018	DDG (Fy.), ICAR, New Delhi
9.	Agriculture Conclave Indira Gandhi	Pratisthan, Lucknow	04-06 October, 2018	Agriculture Department, Uttar Pradesh
10.	Centre Advisory Committee Meeting	ICAR-CIFE, Kolkata Centre, West Bengal	12 October, 2018	ICAR-CIFE, Mumbai
11.	Brainstorming Session of NAHEP	Krishi Anushandhan Bhavan II, ICAR, New Delhi	03 November, 2018	National Director, NAHEP, New Delhi
12.	Centre Advisory Committee Meeting	ICAR-CIFE, Powarkheda Centre, Hoshangabad, Madhya Pradesh	19 November, 2018	ICAR-CIFE, Mumbai
13.	Niche Area of Excellence Meeting	Education Division, KAB-II, Pusa, New Delhi	20 November, 2018	DDG (Agricultural Education), ICAR, New Delhi
14.	International Conference on "Agricultural Education-Sharing Global Experiences"	National Agricultural Science Complex, New Delhi	24-25 November, 2018	IAUA, New Delhi
15.	Farmers Meet and Industry Interaction	CIFE-Rohtak Centre, Haryana	07-10 December, 2018	ICAR-CIFE, Mumbai

16.	Workshop on “Strategies for Improving Professional Fisheries Education in India” r	College of Fisheries, Mangalore, Karnataka	13 December, 2018	College of Fisheries, Mangalore, r Karnataka r
17.	The Next Version of ICAR-ERP	ICAR, Krishi Bhavan, New Delhi r	18 December, 2018	ICAR, New Delhi r
18.	Workshop on “Advances in Oceanography-Indian Ocean Perspective”	CSIR-NIO, Regional Centre, Mumbai	29 December, 2018	CSIR-National Institute of Oceanography, Goa r
19.	International Conference on “Challenges and Opportunities for Sustainable Fisheries and Aquaculture Development”	College of Fisheries, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri	17-20 January, 2019	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, r Dapoli and Interdisciplinary Society for Advancement of Agricultural Sciences and Technology, Dapoli, Ratnagiri
20.	World Brackishwater Aquaculture Conference: BRAQCON	ICAR-CIBA, Chennai	24-25 January, 2019	Society of Coastal r Aquaculture and Fisheries (SCAFI) r
21.	Annual Conference of Vice Chancellors of Agricultural Universities & Directors of ICAR Institutes r	NASC Complex, New Delhi	29-30 January, 2019	DG, ICAR, New Delhi r
22.	Conference of Directors of Fisheries and Animal Sciences Institutes r	NASC Complex, New Delhi	31 January - 01 February, 2019	DDG (FS & AS), r New Delhi r
23.	Regional Expert Consultations Genetically Responsible Aquaculture: Sustainability of Genetically Fit Brood Stock and Seed of Certified Origin in Asian Aquaculture r	ICAR-NBFGR, Lucknow, Uttar Pradesh	26-27 February, 2019	ICAR New Delhi, India and Network of Aquaculture Centres in Asia-Pacific r Centre (NACA), Bangkok, Thailand r
24.	Interaction meeting with Secretary MGM Education Trust Aurangabad	MGM Education Trust,	9 March, 2019	MGM Educational r Trust Aurangabad, r Maharashtra r
26.	Genetic Improvement of <i>Clarias magur</i> : r Present Status and Future Prospects	ICAR-CIFE, Kakinada Centre, Balbhadrapuram, Andhra Pradesh r	15-16 March, 2019	ICAR-CIFE, Mumbai r

10.2 Participation by the faculty, ICAR-CIFE, Mumbai

Name of the faculty	Name of the Programme	Venue	Date	Organized by
Kiran Dube	Sardar-Sarovar project	Nandurbar, Maharashtra	13, 19 April, 2018 1, 20 June 2018; 28 September, 2018 r	Commissioner of Fisheries, Maharashtra r
B. K. Mahapatra	National Conference on “Recent Trends in Zoological Research in North East India”	North Eastern Hill University, Shillong, Meghalaya	19-20 April, 2018	Department of Zoology, North Eastern r Hill University, Shillong, r Meghalaya r
Anathan P.S., Shashi Bhushan, Neha Q., Rath B. Saurav Kumar	National Stakeholder Consultation Workshop on “National Inland Fishery and Aquaculture r Policy of India-2017”	ICAR-CIFE, Mumbai	26-27 April, 2018	ICAR-CIFE, Mumbai r & NFDB, Hyderabad r
Megha K. Bedekar	3 rd Interactive Meeting of Nodal Officers of SDAE	Port Blair, Andaman	04-05 May, 2018	ICAR-CIARI, Port Blair, Andaman r
G. H. Pailan	23 rd Midterm Review Meeting of ICAR Regional Committees (Zone-II)	Umiam, Meghalaya r	10-11 May, 2018	ICAR, New Delhi r
Faculty of CIFE, Mumbai	3rd International Symposium on Aquaculture and Fisheries Education	ICAR-CIFE, Mumbai	16-18 May, 2018	AFS, Malaysia; ICAR-CIFE, Mumbai; r IFA, Mumbai, AFSIB, Mangalore
K. K. Krishnani	The Foundation day and 25 th Annual General Body Meeting of the National Academy of Agricultural Sciences	NASC, New Delhi	04-05 June, 2018	NAAS complex, New Delhi r
Faculty of CIFE, Mumbai	57 th Annual Day	ICAR-CIFE, Mumbai r	06 June, 2018	ICAR-CIFE, Mumbai r
G. H. Pailan A. Biswas	12 th Convocation of WBUAFS	WBUAFS, Kolkata	13 June, 2018	WBUAFS, Belgachia, r West Bengal r
Aparna Chaudhari	Assessment of Technologists of Export Oriented Establishments	Export Inspection Agency, Mumbai r	20 June, 2018	EIA, Mumbai r
Muralidhar P. Ande	24 th Meeting of ICAR Regional committee -II	ICAR-CIFA, Bhubaneswar, Odisha	22-23 June, 2018	ICAR-CIFA, r Bhubaneswar, Odisha r
Faculty of CIFE, Mumbai	National Fish Farmers’ Day	ICAR-CIFE, Mumbai r	10 July, 2018	ICAR-CIFE, Mumbai r
Gayatri Tripathi	Workshop on “Competency & Skill Building”	Mumbai	13 July, 2018	POSH at Work, r Ministry of Women & Child Development, GOI r
Muralidhar P. Ande	Workshop on “Ground Water Salinity Source Identification in Godavari Delta”	National Institute of Hydrology, Kakinada r	25 July, 2018	National Institute of Hydrology, Kakinada, Andhra Pradesh r

Paramita B. Sawant B. K. Mahapatra	Launching Workshop on Network project on 'Ornamental Fish Breeding and Culture'	ICAR-CMFRI, Kochi, Kerala	28 July, 2018	ICAR-CMFRI, Kochi, Kerala
Muralidhar P. Ande	Science and Engineering Research Board (SERB), DST Government of India	Indian Institute of Technology, New Delhi	30 July, 2018	IIT, New Delhi
K. K. Krishnani	Workshop on "Application of Biosensor Technology in Inland Fisheries".	ICAR-CIFRI, Barrackpore	01 August, 2018	ICAR-CIFRI, Barrackpore, West Bengal
K. K. Krishnani	Meeting on "GIS and Remote Sensing for Mapping Water Bodies in Different States of India"	ICAR-CIFRI, Barrackpore	02 August, 2018	ICAR-CIFRI, Barrackpore, West Bengal
Sunil Kumar Nayak	Madhya Pradesh Main Matsya Beej Ke dar tay kar ne keliye	Bhadbhada, Bhopal	10 August, 2018	Department of Fisheries, Govt. of Madhya Pradesh
Vidya Shree Bharti	International Conference on "Agriculture and Allied Sciences: The Productivity, Food Security and Ecology"	BCKV, Mohanpur, Nadia, West Bengal	13-14 August, 2018	Department of Agricultural Extension, BCKV, Mohanpur
G. H. Pailan	Meeting on Doubling of Farmers Income	BCKV, Kalyani	18 August, 2018	BCKV, Mohanpur, West Bengal
K. K. Krishnani	Brainstorming Session on "Promotion of Livestock, Dairy, Poultry and Fishery as Engines of Growth"	Pune, Maharashtra	02 September, 2018	Commissionerate of Animal Husbandry, Pune, Maharashtra
Neelam Saharan	Orientation Program for Retiring Officials	JNU, New Delhi	10- 11 September, 2018	Institute of Secretariat Training and Management, New Delhi
Latha Shenoy	OTP for retiring government officials	ISTM, Delhi	10-11 September, 2018	ISTM, Delhi
Faculty of CIFE, Mumbai and its Regional Centres	Hindi Pakhwada 2018	ICAR-CIFE, Mumbai	14 September, 2019	ICAR-CIFE, Mumbai
Faculty of CIFE, Mumbai	NAHEP Launch Workshop	ICAR-CIFE, Mumbai	15 September, 2018	Education Division, ICAR and ICAR-CIFE, Mumbai
G. H. Pailan	Workshop on 'Soil & Land Use Policy'	ICAR-NBSS & LUP, Regional Centre, Kolkata	18 September, 2018	ICAR-NBSS & LUP, Regional Centre, Kolkata
Madhuri S. Pathak	National Conference on "Recent Trends and Advances in Fresh Water Diversity"	Science College Nanded, Maharashtra	25 September, 2018	Department of Fishery Science, N.E.S. Science College, Nanded, Maharashtra

Faculty of CIFE, Mumbai	Workshop on 'Hindi Unicode Karyshala'	ICAR-CIFE, Mumbai	26 September, 2018 r	ICAR-CIFE, Mumbai r
S. N. Ojha, Arpita Sharma, Shivaji Argade, S. K. Sharma, Deepak Khogre, r Sanjeevan Kumar	Rastriya Mahila Kisan Diwas	Versova Fishing Village, Mumbai	15 October, 2018	ICAR-CIFE, Mumbai r
V. Harikrishna, Satya Prakash	Agri-Startup and Entrepreneurship Conclave	NASC New Delhi	16-17 October, 2018 r	ICAR, New Delhi r
Vidya Shree Bharti	Research Frontiers in Precision Agriculture, 2018	CSRE, Indian Institute of Technology, Mumbai	24-26 October, 2018	Indian Society of Agricultural Information Technology and University of Agricultural Sciences, Dharwad, Karnataka r
Megha K. Bedekar	Annual Review Meeting of ICAR-CRP on Vaccines & Diagnostics	ICAR-CIBA, Chennai	30-31 October, 2018 r	ICAR-CIBA, Chennai r
B. B. Nayak	South Indian Fisheries Minister's Conference	ICAR-CMFRI, Kochi, Kerala	10-11 November, 2018	ICAR-CMFRI, Kochi, Kerala r
B. K. Mahapatra	Meeting of Assessment Committee for CAS	ICAR-CIFRI, Barrackpore	15-17 November, 2018	ICAR-Central Inland Fisheries Research Institute, Barrackpore r
G. H. Pailan r	Meeting with the Hon'ble Minister of Agriculture and Farmers' Welfare, r Govt. of India r	NBSS, & LUP, Kolkata	16 November, 2018	ICAR-NBSS & LUP, Regional Centre, Kolkata r
Faculty of CIFE, Mumbai	POSH workshop on "Discrimination and Harassment at Workplace"	ICAR-CIFE Mumbai	17 November, 2018	NAHEP-CIFE and ICAR-CIFE, Mumbai
A.K. Verma	5 th National Conference on "River Basins Sustainability: Water Scarcity Agricultural Production, Climate Change and Natural Disasters	Allahabad	17-18 November 2018	Sam Higginbottom University of Agriculture, r Technology and Sciences, r Allahabad & River Water r User Association (India), r Allahabad r
Faculty of CIFE, Mumbai	Awareness About the Use of Turnitin Software	CIFE, Mumbai	19 November, 2018 r	ICAR-CIFE, Mumbai r
Sanath Kumar H.	International Conference on "Microbiome Research (ICMR)"	Pune University, Pune, r Maharashtra	19-22 November, 2018 r	ICMR, Pune, Maharashtra r
Parimal Sardar	XI Biennial Conference of Animal Nutrition Association (ANACON 18) on "Reorienting Animal Nutrition Research in the Perspective of Farmers Welfare"	Bihar Animal Science University, Patna	19-21 November, 2018	Bihar Animal Science r University, Patna and Animal Nutrition Association, Izatnagar, Uttar Pradesh r

G. H. Pailan	Farmer's Day Celebration	ICAR-CSSRI, Regional Research Station, Canning Town	20 November, 2018	ICAR-Central Soil Salinity Research Institute, Regional Research Station, Canning Town
G. H. Pailan	Chaired a Session for International Symposium & VIII-IMSACON Kolkata	WBUAFS, Chakgaria,	22 November, 2018	WBUAFS, Chakgaria, Kolkata
S. N. Ojha, Arpita Sharma, Swadesh Prakash, P. S. Ananthan	23 rd Extension Council Meeting	ICAR-CIFE, Mumbai	30 November, 2018	ICAR-CIFE, Mumbai
G. H. Pailan Sujata Sahoo	ISEE National Seminar on "Integrated Farming System for Enhancing Farmers' Income and Nutritional Security"	WBUAFS Chakgaria, Kolkata	05-07 December, 2018	WBUAFS, Chakgaria, Kolkata
HoDs and Scientists from centre and headquarter	Sensitization Workshop, Farmers Meet & Industry Meet on Inland Saline Aquaculture	ICAR-CIFE, Rohtak Centre	08 December, 2018	NAHEP-CIFE, Mumbai
Manjusha L.	59th Annual Conference of Association of Microbiologists of India (AMI)	University of Hyderabad, Hyderabad	09-12 December, 2018	Association of Microbiologists of India (AMI) & University of Hyderabad
Sikendra Kumar	Aqua-Poultry-Dairy Expo 2018	ICAR-NBFGR, Lucknow, UP	11-13 December, 2018	Centre for Agriculture and Rural Development
Aparna Chaudhari Mujahid K. Pathan	First National Genetics Congress	ICAR-IARI, New Delhi	14-16 December, 2018	ICAR-IARI, New Delhi
Ashutosh D. Deo	The Next Version of ICAR-ERPCR-I	IASRI New Delhi	18 December, 2018	ICAR-IASRI, New Delhi
G. H. Pailan	Silver Jubilee Foundation Day of WBUAFS, Kolkata	WBUAFS Kolkata	02 January, 2019	WBUAFS, Kolkata
G. H. Pailan	Foundation day of ICAR-NINFET, Kolkata	ICAR-NIRJAFT Kolkata	03 January, 2019	ICAR-NINFET, Kolkata
G. H. Pailan B. K. Mahapatra	Bengal Fish Fest-2019	ICAR-CIFE, Kolkata Centre	12 January, 2019	Department of Fisheries, Govt. of West Bengal and Indian Chamber of Commerce
Rajendran K. V., B. B. Nayak, Mukunda Goswami	31 st All India Congress of Zoology (31 st AICZ) and National Seminar on "Climate Smart Aquaculture and Fisheries (CSAF)"	CAU-College of Fisheries, Lembucherra, Agartala, Tripura	15-16 January, 2019	Central Agricultural University, Imphal
Gireesh Babu, Annam Pavan Kumar, Pankaj Kumar, Sikendra Kumar, Arun Sharma T. I. Chanu	International Workshop on "Aquaculture on Genomic Selection"	ICAR-CIFE, Mumbai	16-18, January, 2019	ICAR-CIFE, Mumbai

Aparna Chaudhari, Parimal Sardar, A. K. Balange, Babitha Rani, Tincy Varghese, Shamna N, Neha W. Qureshi, Madhuri S. Pathak	International Conference on “Challenges and Opportunities for Sustainable Fisheries and Aquaculture Development (COSFAD 2019)”	College of Fisheries, Ratnagiri Maharashtra	17-20 January, 2019	College of Fisheries, Ratnagiri and Interdisciplinary Society for Advancement of Agricultural Sciences and Technology (ISASaT)
S. N. Ojha, Arpita Sharma, Shivaji Argade, Neha W. Qureshi, S. K. Sharma, Deepak Khogre, Sanjeevan Kumar	Sea Food Festival	Versova Fishing Village	18-20 January 2019	Versova Koli Machhimar Society, Mumbai
R. P. Raman, P. B. Sawant, Ashutosh D. Deo	World Brackishwater Aquaculture Conference BRAQCON, 2019	ICAR-CIBA, Chennai	23-25 January, 2019	Society of Coastal Aquaculture and Fisheries (SCAFI) and ICAR-CIBA, Chennai
Rajendran K. V.	Workshop on “Need for Uniform Policy on Fish Disease Diagnosis and Quarantine”	NASC Complex, New Delhi	29 January, 2019	National Academy of Agricultural Sciences (NAAS)
G. H. Pailan Sujata Sahoo	19 th Indian Veterinary Congress, XXVI Annual Conference of IAAVR and National Symposium on “Innovative Progress in Animal Health and Production for Safe and Secured Food Under One Health Perspective”	WBUAFS, Kolkata	01 February, 2019	WBUAFS, Chakgaria, Kolkata
A. K. Balange	MAHA-AGRO 2019	Aurangabad	02 February, 2019	MACCIA & Govt. of Maharashtra
B. B. Nayak	Meeting on “Road Map for Utilization of Bio Resources Towards Bio-economy”	INSA, New Delhi	04-05 February, 2019	INSA, New Delhi
Rajendran K. V.	3 rd Annual Meeting and Progress Review of Indo-UK, DBT-BBSRC- funded Project	Bangladesh Agricultural University, Mymensingh, Bangladesh	07-09 February, 2019	Bangladesh Agricultural University, Mymensingh, Bangladesh
Gireesh Babu	Expert Consultation on “Planning for Shaping Departments of the College of Fisheries”	College of Fisheries, Kishanganj	07-09 February, 2019	College of Fisheries Bihar Kishanganj, Bihar
Pankaj Kumar, Sreedharan K., Satya Prakash	ICAR-CSSRI Golden Jubilee International Salinity Conference on “Resilient Agriculture in Saline Environments under Changing Climate: Challenges & Opportunities”	ICAR-CSSRI, Karnal, Haryana	07-09 February, 2019	ICAR-CSSRI Karnal, and Indian Society of Soil Salinity and Water Quality, Karnal, Haryana

S. Munilkumar	Agri Summit 2019	Motihari, Bihar	09-11 February, 2019	ICAR-RCER, Patna/ Mahatma Gandhi Integrated Farming Research Institute, Motihari, Bihar r
Muralidhar P. Ande	Board of Studies Meeting	Ideal College of Arts and Science, Kakinada, r Andhra Pradesh r	12 February, 2019	Ideal College of Arts and Science, Kakinada, Andhra Pradesh r
S. Dasgupta r	Expert Committee meeting on 'Hilsa Phase II'	NASC New Delhi	14 February, 2019	NASC Complex, New Delhi r
Pankaj Kumar, Sreedharan K. Ashok Kumar	4 th Agriculture Leadership Summit-2019	Ganaur, Sonapat, Haryana r	15-17 February, 2019	Department of Fisheries, Haryana r
Faculty of CIFE, Mumbai	Syllabus Revision and Academic Reformation in Higher Fisheries Education	ICAR-CIFE, Mumbai	18-19 February, 2019	ICAR-CIFE, Mumbai and BSMA (Fisheries Science), ICAR r
Karankumar K. Ramteke	Workshop on "Developing Effective Strategies for Managing Marine Ecosystems in a Changing Climate" r	Columbia University's Global Centre, Mumbai r	20-21 February, 2019	CSRE, IIT Bombay and r Columbia University, USA r
K. K. Krishnani, Satyendar Singh, Gyan Chand	The XIV Agricultural Science Congress	NASC, New Delhi	20-23 February, 2019	National Academy of Agricultural Sciences in r collaboration with ICAR
Rajendran K.V.	National Seminar on 'Recent Trends in Parasitology'	Research Department of Zoology, Kannur University, Kerala	22-23 February, 2019 r	Kannur University, Kerala r
Rajendran K. V.	Aqua Clinics & Aquapreneurship Development Programme (AC&ADP)	Cochin University of Science and Technology, Kochi	25 February, 2019	National Centre for Aquatic Animal Health, Cochin University of Science and Technology, Kochi, Kerala r
ICAR-CIFE staff	National Symposium in Hindi on "Rashtriya Vaigyanik Rajvasa Parisambad"	ICAR-CIFE, Mumbai	25-26 February, 2019 r	ICAR-CIFE, Mumbai
Faculty of CIFE, Mumbai	Academia-Industry Interface Meet	ICAR-CIFE, Mumbai	28 February, 2019	ICAR-CIFE Mumbai ICAR-NAHEP
G. H. Pailan r	RAC meeting	ICAR-CIFE, Mumbai r	02-03 March, 2019	ICAR-CIFE, Mumbai r
Karankumar K. Ramteke	Interaction with tribal fishermen community for livelihood improvement through interventions in fisheries (Under TSP Scheme) r	Nandurbar	06 March, 2019	FRHPHM division of ICAR-CIFE r
S. N. Ojha, Arpita Sharma	Sea Food Festival	Versova Welfare	08-10 March, 2019	Versova Koli Mahila Samajik Sanstha, Mum4 r

G. H. Pailan	Scientific Advisory Committee (SAC) meeting of the Ramakrishna Ashram Krishi Vigyan Kendra, Nimpith	Ramakrishna Ashram Krishi Vigyan Kendra Nimpith, West Bengal	11 March, 2019	Ramakrishna Ashram Krishi Vigyan Kendra, Nimpith, West Bengal
Staff of CIFE Kakinada Centre S. N. Ojha, Parimal Sardar	Academia-Industry Interface Meet	Hotel Royal Grand, Kakinada, Andhra Pradesh	15 March, 2019	ICAR CIFE Mumbai and CIFE-NAHEP
K. V. Rajendran S. N. Ojha, Parimal Sardar, G. H. Pailan, B. K. Mahapatra, All staff of CIFE Kakinada Centre	National workshop on 'Genetic Improvement Present Status and Future	FWFF, Balabhadrapuram, Andhra Pradesh	16 March, 2019	ICAR CIFE Mumbai and CIFE- NAHEP
Mukunda Goswami	105 th Indian Science Congress	Manipur University, Manipur	16 -20 March, 2019	Indian Science Congress
Faculty of CIFE, Mumbai	3 rd Student Convention on "Next Generation Aquaculture: Panacea to Employment challenges"	ICAR-CIFE Mumbai	25-26 March, 2019	ICAR-CIFE, Mumbai with CIFE-NAHEP
G. H. Pailan	HACCP & Export Certification of Fish and Fishery Products	Hotel Regenta Orko's Kolkata	29 March, 2019	Export Inspection Agency, Kolkata

10.3. Visits abroad

Name of the Faculty	Programme/ purpose of visit	Organized by	Funded by	Place	Date
Arpita Sharma	Fifth International Fishing Industry Safety & Health (IFISH)	Conference Memorial University, Canada and Agriculture Organization of the United Nations r	Memorial Food and Agriculture Organization Nations r	St. John's, Newfoundland, Labrador, r Canada r	10-13 June, 2018 r
N. P. Sahu	International Seminar on "Rice Bran as Animal Feed" Bangladesh Agriculture University, Bangladesh	Bangladesh Agriculture University, Bangladesh r	Mymensingh, Bangladesh	Bangladesh Agriculture University r	05-06 July, 2018
Arpita Sharma	Biennial Conference of the International Institute of Fisheries Economics and Trade (IIFET), Adapting to a Changing World: Challenges and	IIFET and University of United States of America Oregon State r University, United States of America	University of Washington, Seattle r	United States of America	16-20 July, 2018 r
Arpita Sharma and P. S. Ananthan	Global Conference on Gender in Aquaculture and Fisheries-GAF Gender in Aquaculture and Fisheries, Bangkok, Thailand	7GAF and Asian Institute of Technology, Bangkok, Thailand r	Asian Institute of Technology, Bangkok, Thailand	Asian Institute of Technology, Bangkok, Thailand r	18-20 October, 2018
K. Pani Prasad	Keynote Speaker during International Conference on Aquatic Resources and Aquaculture	World Aquaculture Society & Hawassa University r	Hawassa University, Ethiopia	Hawassa, Ethiopia	10-12 January, r 2019 r
K. Pani Prasad	Thesis evaluation Vels University, Chennai & University Putra Malaysia	University Putra Malaysia	Malaysia	University Putra Malaysia	02 February, r 2019 r
Rajendran K.V.	3 rd Annual Meeting and Progress Review of Indo-UK, DBT-BBSRC-funded Project	Bangladesh Agricultural University, Mymensingh, Bangladesh	Department of Biotechnology Govt. of India	Bangladesh Agricultural University, Mymensingh, Bangladesh r	07-09 February, 2019 r
Paramita B. Sawant and Babitha Rani A.M.	Short International Exposure Visit Asian Institute of Technology, Thailand r	Asian Institute of Technology, Thailand	ICAR-NAHEP	Asian Institute of Technology, Thailand r	18-22 March, 2019 r

10.4. Training Programmes/Winter schools/CAFT Programmes etc. Attended

Name of the faculty	Name of the Training/ programmes/ Summer School etc.	Place	Date
Shivaji Argade, Shamna N. and Neha W. Qureshi	Impact Evaluation of Agricultural Technologies	Sher-i-Kashmir International Conference Centre (SKICC), Srinagar, J&K State r	02-06 April, 2018 r
Paramita B. Sawant	Recent Advances in Soil and Water Management in Brackish Water Aquaculture	ICAR-Central Institute of Brackishwater r Aquaculture r Chennai r	25-30 June, 2018 r
K. Pani Prasad and Jeena K	FAO-ICAR Training on “WHONET Software for Data Management of Antimicrobial Resistance (AMR)”	ICAR-National Bureau of Fish Genetic Resources r Lucknow r	17-18 August, 2018 r
Aparna Chaudhari	Intellectual Property Valuation and Technology Management	ICAR- National Academy of Agricultural Research Management, Hyderabad	24-29 August, 2018
Shivaji Argade	Climate Change and Abiotic Stress Management Strategies for Doubling Farmer's Income	ICAR-National Institute of Abiotic stress Management Baramati, Pune, Maharashtra r	07-27 September 2018
Pankaj Kumar	Algal Culture	ICAR-CIFE, Mumbai	16-22 September, 2018
Saurav Kumar	LC-MS Based Proteomics (PROTEO)	CSIR- The Centre of Cellular & Molecular Biology, Hyderabad	03-12 October, 2018
Dasari Bhoomaiah	Advances in web and mobile app development	ICAR- National Academy of Agricultural Research Management, Hyderabad r	05-10 October, 2018
Layana P.	Electrospinning for Nanofibre Production and Its Applications	ICAR- Central Institute for Research on Cotton Technology, Mumbai	29-31 October, 2018
Kundan Kumar	Environmental Impact Assessment	CSIR-National Environmental Engineering Research Institute, Nagpur r	29 October - 02 November, 2018
Rathi Bhuvaneswari G.	Spectroscopic & Chromatographic Techniques for Material Characterization r	ICAR- Central Institute for Research on Cotton Technology, Mumbai	27-29 November, 2018
Jeena K.	Gene Mining Approaches and In Silico Functional Analyses	ICAR- CIFE, Mumbai	03-23 December, 2018

V. Hari Krishna	Training of Trainers Programmes Agricultural Technology Application	Research Institute, Kanpur, Uttar Pradesh	17-19 December, 2018
Manish Jayant	Training on Experimental Design and Statistical Data Analysis	ICAR-Indian Agricultural Statistics Research Institute, New Delhi	03-16 January, 2019
K. Pani Prasad	Assessment Tool for Laboratory AMR Surveillance System (ATLASS) Assessors Training	ICAR-Central Institute of Fisheries Technology, Kochi, Kerala	21-25 January, 2019
Arun Sharma and T.I. Chanu	Development and Application of Vaccines for Fish Aquaculture	ICAR-CIFE Mumbai	04-13 February, 2019
Principal Scientist of ICAR-CIFE, Mumbai	Emotional Intelligence for Personal and Work Excellence	ICAR-CIFE Mumbai	12-13 February, 2019
Madhuri S. Pathak	Digital Teaching Techniques	ICAR- The National Academy of Agricultural Research Management, Hyderabad	14-20 March, 2019

11

Meetings/Workshops/ Seminars/Summer/ Winter Schools Organised

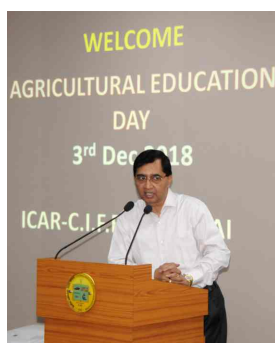




11.1 Seminars/Symposium/Conferences/ etc organised

Sr. no	Date	Title	Venue	No. of Participants
1.	26-27 April, 2018	National Stakeholder Consultation Workshop on "National Inland Fishery and Aquaculture Policy of India" r	ICAR-CIFE, Mumbai	150 r
2.	15 May, 2018	2 nd Deans Meeting	ICAR-CIFE, Mumbai	75
3.	16 May, 2018	3 rd International Symposium on "Aquaculture and Fisheries Education (ISAFE3)" r	ICAR-CIFE, Mumbai	300 r
4.	05 June, 2018	World Environment Day	ICAR-CIFE, Mumbai	70 r
5.	06 June, 2018	57 th Annual Day of ICAR-CIFE	ICAR-CIFE, Mumbai	400 r
6.	21 June, 2018	4 th International Yoga Day	ICAR-CIFE, Mumbai	150 r
7.	10 July, 2018	National Fish Farmers' Day	ICAR-CIFE, Mumbai and its regional centres r	200 r
8.	15 August, 2018	72 nd Independence Day	ICAR-CIFE, Mumbai and its regional centres r	350 r
9.	25 August, 2018	Dr. C. V. Kulkarni Memorial Lecture	ICAR-CIFE, Mumbai	100 r
10.	10 September, 2018	Workshop on "Sustaining Enterprise in Sunderban"	Gosaba block of Sunderban, Kolkata	55 r
11.	14 September, 2018	Hindi Pakhawada	ICAR-CIFE, Mumbai and its regional centres r	350 r





12.	15 September, 2018	Launch Workshop of CAAST-NAHEP (Centres for Advanced Agricultural Science and Technology-National Agricultural Higher Education Project) r	ICAR-CIFE, Mumbai	100 r
13.	15 September-2 October, 2018	Swachch Bharat Pakhawada	ICAR-CIFE, Mumbai and its regional centres r	300 r
14.	26 September, 2018	Hindi Unicode Karyashala	ICAR-CIFE, Mumbai	142 r
15.	29 October, 2018	Hindi Workshop	ICAR-CIFE, Mumbai	32 r
16.	29 October-3 November, 2018 r	Vigilance Awareness Week	ICAR-CIFE, Mumbai	125 r
17.	17 November, 2018	POSH Workshop under NAHEP on "Discrimination and Harassment at Workplace"	ICAR-CIFE, Mumbai	120 r
18.	19 November, 2018	Awareness About Use of Turnitin Software r	ICAR-CIFE, Mumbai r	
19.	03 December, 2018	Agricultural Education Day	ICAR-CIFE, Mumbai1	25 r
20.	05 December, 2018	World Soil Day	CAR-CIFE, Mumbai	100 r
21.	15 December 2018	One day Awareness Workshop on 'Aquaculture Technologies' r	Collector's Office, Nandurbar r	200 r
22.	12-18 February, 2019	National Productivity Week on "Circular Economy for Productivity and Sustainability". r	ICAR-CIFE, Mumbai	80 r
23.	16-18 February 2019	International Workshop on "Genomic Selection in Aquaculture " r	ICAR-CIFE, Mumbai	50 r
24.	25-26 February, 2019	Rashtriya Vaigdnayanik Raajbhasha Parisawand r	ICAR-CIFE, Mumbai	52 r
25.	28 February, 2019	Academia-Industry Interface Meet under NAHEP r	ICAR-CIFE, Mumbai	16
26.	15 March, 2019	Academia-Industry Interface Meet under NAHEP	Hotel Royal Grand, Kakinada, Andhra Pradesh r	21 r
27.	15-16 March, 2019	Hindi Sanghosti	ICAR-CIFE, Mumbai and Kakinada Centre r	55 r
28.	15-16 March, 2019	National Workshop on 'Genetic Improvement of <i>Clarias magur</i> : Present Status and Future Prospects' r	ICAR-CIFE Kakinada Centre	100 r
29.	25-26 March, 2019	Third Students Convention on 'Next Generation Aquaculture: Panacea to Employment Challenges' r	ICAR-CIFE, Mumbai	350 r



Third Students' Convention on Next Generation Aquaculture: Panacea to Employment Challenges

The 3rd Students' Convention on 'Next Generation Aquaculture: Panacea to Employment Challenges' was successfully organized by ICAR-Central Institute of Fisheries Education, Mumbai. The programme was sponsored by National Agricultural Higher Education Project (NAHEP) during 25-26 March, 2019 at ICAR-CIFE, Mumbai. The theme and objective of the convention was to come out with innovative technology and ideas for next generation aquaculture with special reference to solve the problems in employment for fisheries professionals. Around 350 students from 26 fisheries colleges of India including CIFE participated in the program. The program was inaugurated on 25 March 2019 at ICAR-CIFE, Mumbai. Dr. C. N. Ravishankar, Director, ICAR-CIFT, Kochi was the chief guest of the function and Dr. Gopal Krishna, Director & Vice-chancellor, ICAR-CIFE presided over the function and released the abstract book of the convention containing the brilliant and innovative ideas of the students. Welcoming all the youth of the fisheries colleges, the main stakeholder of this convention, Dr. N. P. Sahu, Dean (Academics) and Pedagogy component leader of NAHEP, briefed about the two-days programme and explained about the technical sessions. Dr. Gopal Krishna, Director & Vice-chancellor, ICAR-CIFE, Mumbai emphasized on the existing professional skills of the fisheries professionals and urged them to become

innovative, problem solvers and job givers rather than job seekers. Dr. C. N. Ravishankar, Director, ICAR-CIFT, Kochi delivered the key note address on the Development of an entrepreneurial support system, shared the experiences of ICAR-CIFT and briefed on the current start-up scenario of the country and the existing policy support system. He also emphasized on the importance of agri-business incubation centre and how it has succeeded in inculcating the entrepreneurial spirit among the aspiring entrepreneurs. Dr. N. K. Chadha, HoD, Division of Aquaculture, ICAR-CIFE, Mumbai presented the formal vote of thanks. He extended his heartfelt thanks to ICAR, New Delhi for funding the NAHEP project.

The convention was principally conducted under four thematic technical sessions viz. r

- Start-up in fisheries for promoting entrepreneurship among the students
- Smart interactive session on job opportunities for post-graduate students r
- Innovative concepts for energy efficient and environment friendly technology for sustainable aquaculture
- Mind mapping on next-generation aquaculture

All the ideas received from the students were pre-screened and the selected ideas were presented by the students. In all the sessions, the audience was invited to poll their opinion through Instagram and WhatsApp. r

The first technical session was on “Start-up in fisheries for promoting entrepreneurship among the students”. This session was digitally polled by the students and was very interactive. The session contained the five best start-up ideas selected among 50 start-up ideas. The important concepts were; r

- Artificial Intelligence based Fish Activity Tracking Module and Automation System(FATMAS) – emphasized on use of various sensors for capturing the activities behaviour of fishes under water as well as the water quality parameters in big fish ponds, cultivation at a large scale
- Multi-storey Aquaculture System – focussed on using less space for cultivation and use of water efficiently for multi-species culture
- Turbine Aerators: Facility to Enhance Productivity – emphasized on reducing the burden of electricity charges and operating aerators with the help of wind power instead of electricity or diesel
- Scrap to Art: Approach to Fish scale utilisation Towards Women Empowerment–promoting fish scale as a raw material for producing ornaments, show pieces, and other accessories
- Integrated Floating Cage in a Aquageoponics System (IFCAS)-

emphasizing on developing a symbiotic relationship between plant and fish, provide ammonia freewater and providing technology towards doubling the income of fish farmers r

ICAR-CIFE also took the initiative to invite entrepreneurs who are well established in the field of fisheries such as Mr. Saqib Ahmad Dar, owner of Crystal Aquatics and an ornamental fish entrepreneur; Mr. Nakul Sadaphule, an alumni of CIFE and consultant in Aqua One centre and a entrepreneur in the field of cage installation; Dr. Sharad Jaykumar Tombri, founder of “KO” Foodko Products & CEO of Indian Home Gourmet; Mrs. Rowena Pinto, the proprietor of Judes Food Products, Mumbai; Mr. Karthik Ramesh, Program Manager (Fisheries), TATA Trusts, Mumbai; Dr. Azad Dubey, Director, Blue Vision Aquaculture, Gujarat; and Mr. Arun Kumar R., GM (Technical), RNK Agro & Chemical Pvt. Ltd., Andhra Pradesh. They shared the nuances of entrepreneurship and their experiences in their business ventures. r

The second technical session was planned and conducted by forming a WhatsApp group containing one representative from each college as members of the group. Some of the crucial issues like basic qualification for ARS and





assistant professor posts, fish doctors in line with veterinary doctors, gender issues in higher education and Job opportunity etc were discussed. r

The day concluded with cultural program hosted by CIFE which provided an opportunity to all the participating students to display their state dances and culture. r

The second day began with third technical session on “Innovative concepts for energy efficient and eco-friendly technology for sustainable aquaculture”. The session comprised of 10 best oral presentations. The students came up with very innovative ideas that they were keen to implement in the fisheries sector as to bring changes in nextgeneration aquaculture. Some of the ideas were; r

- Biofloc technology for fish seed rearing incorporated with aquaponics
- Aqua mimicry for shrimp culture
- Robotic fish
- Organic aquaculture
- Aqua voltaic in cage culture
- Probiotic enzymes nutritional pack culture – pen-pack culture

This was followed by the fourth technical session “Mind mapping on next generation aquaculture”. The session had themed posters. The posters made were self-explanatory and also depicted brilliant ideas for next generation aquaculture technologies. The day concluded with a

valedictory program by releasing the newsletter of the convention. Dr. S. D. Tripathi, Former Director, ICAR-CIFE, Mumbai and Dr. Ambekar E. Eknath, Former Director, ICAR-CIFA, Bhubaneswar graced the occasion. The convention concluded with the remarks by the guests. Dr. Gopal Krishna, Director & Vice-Chancellor, ICAR-CIFE appreciated the student's for their innovative concepts and participation in various technical session. Dr. N. P. Sahu, Dean (Academics) and Pedagogy component leader of NAHEP, presented recommendations and reports generated during the two days programme. Prizes and certificates were distributed to the winners. r

Report on NAHEP-CAAST Project Launch Workshop at ICAR-CIFE, Mumbai

ICAR-CIFE has bagged the prestigious competitive grant under National Agricultural Higher Education Project funded by Govt. of India and World Bank and administered by ICAR-Education Division on “Development of Energy Efficient and Environment Protective Aquaculture Technologies for Degraded Soils” with a grant support of 1994 lacs. The NAHEP Project was formally launched by Dr. N.S. Rathore, Deputy Director General (Agri. Edn.), ICAR & National Director (NAHEP) on 15th September 2018 at an official ceremony in ICAR-CIFE, Mumbai.



Dr. Gopal Krishna, Director, ICAR-CIFE & Principal Investigator of the Project welcomed the chief guest and briefed about the Project. Explaining the rationale behind the project, he highlighted the opportunities for aquaculture in the inland salt affected and degraded soils of north and north-west India. Emphasising the need to develop energy efficient, eco-friendly, ICT enabled and economically feasible technologies for promoting entrepreneurship and employment, he said that the NAHEP Project would launch CIFE as a formidable Global Knowledge Centre by developing a Centre of Excellence in Inland Saline Aquaculture.

Dr. N. S. Rathore in his address congratulated the CIFE team for coming out with this novel and winning proposal and stressed on the efforts needed in fulfilling the project objectives within an agreed timeframe. He emphasized that energy efficiency and environment conservation have become essential to any technology development in the present era and hoped that the project would come out with technological breakthroughs. Further, he urged the scientists to avail the international and national HRD opportunities offered by the Project and upgrade their skills. He called for integration of recent advances in artificial intelligence. He exhorted that compliance with 3Ts of

governance (Transparency, creating a Trouble free work environment and Timely action) would be the key to success of the Project. He later inaugurated the NAHEP Project Office at ICAR-CIFE.

Dr. N. P. Sahu, Dean (Academics), ICAR-CIFE proposed the vote of thanks. Dr. Gayatri Tripathi, Principal Scientist & Nodal Officer, NAHEP Project coordinated the programme.

Third International Symposium on Aquaculture and Fisheries Education (ISAFE3)

In a glittering function at ICAR-Central Institute of Fisheries Education, Versova, Mumbai, the Third International Symposium on Aquaculture and Fisheries Education (ISAFE3) organized by the Asian Fisheries Society, Malaysia in partnership with Indian Fisheries Association was inaugurated on 16 May 2018. The Chief Guest, Shri Mahadev Jankar, the Hon'ble Minister for Animal Husbandry, Dairy and Fisheries, Gov't of Maharashtra accompanied by luminaries like Padmavibhushan Dr. Anil Kakodkar, Former Chairman of Atomic Energy Regulatory Board, Dr. J. K. Jena, President of the Asian Fisheries Society and DDG (Fisheries Science), Indian Council of Agricultural Research (ICAR); Dr. C. Virapat, DG of

Network of Aquaculture Centres in Asia Pacific (NACA), Thailand and Prof. S. Kaushik, European Research Area (ERA) – Chair Professor, Spain flagged off the three day Symposium. The event was attended by over 300 delegates from India and other countries including Bangladesh, Bhutan, Ethiopia, France, Korea, Nepal, Thailand, Spain and Sri Lanka. The Convener, Dr. Gopal Krishna, Director, ICAR- CIFE welcomed the guests and stated that the theme of the Symposium, 'Fisheries Education for Sustainable Blue Economy' is particularly relevant in the face of growing human population and climate change concerns. The delegates will deliberate on the strategies for enhancing the quality of fisheries education in the Asia Pacific region to cater to the training needs of various stakeholders of the Blue Economy so as to promote employment, entrepreneurship, environment friendly practices and sustainability in the region. Dr. Jena emphasized that the 3 Es of 'Sustainability' - Economy, Equity and Ecology are main concerns of the Symposium and that transformation of fisheries education system will be brought about by a constructive and confident attitude of the teachers and students. Dr. Kaushik underlined the importance of strong international linkages for improving

education. Dr. Virapat expressed the necessity of bridging the urban and rural gap through education. He also acknowledged India's strength in genetic improvement, germplasm conservation and diversity. He attracted the attention of the delegates towards gender equality in fisheries. In his Keynote Address, Padmavibhushan Dr. Anil Kakodkar said that the knowledge bridge between cities and villages requires institutions located in villages that serve as links between advanced knowledge generated in the universities and deeper dissemination and adoption of technologies in villages. He called the ecosystem so generated 'Cillage' and expressed his belief that through this approach villages may expand to include manufacturing along with agriculture and become strong partners in India's endeavor for sustainable development. r

The valedictory function of the 3rd International Symposium of Aquaculture and Fisheries Education was held on 18 May, 2018. The Chief Guest of the valedictory function was Dr. T. Mohapatra, Secretary, DARE and Director General, ICAR. During the welcome address of the function, Dr. Gopal Krishna, Convener and the Director ICAR-CIFE informed that the conference was attended by more than 260 participants



from India and 15 participants from different countries viz., Sri Lanka, Bangladesh, Thailand, Ethiopia, France, Nigeria, Bhutan, South Korea, Nepal and Spain. The symposium had six technical sessions along with poster and oral presentations by the delegates and the students. In a special session on “Course Curricula in Asia-Pacific region for better job opportunities”, Dr. N. S. Rathore, DDG (Agriculture Education) ICAR addressed the gathering and emphasized different ways for attracting the talent in agriculture. He appraised about the different schemes launched by ICAR for the benefit of different stakeholders of agricultural education. An exhibition was also organized on this occasion in which ICAR institutes and industry partners participated. Dr. J. K. Jena, President AFS and DDG (Fisheries Science), ICAR emphasized on transforming the sector through advanced education and building a futuristic student community with knowledge and skill. Dr. S. D. Tripathi, Former Director, ICAR-CIFA and Former Director, ICAR-CIFE and Dr. C. Virapat, Director General, NACA also opined on the linkages of the institutions for betterment of education system and skilling the professionals.

Secretary, DARE and DG, ICAR, Dr. T. Mohapatra in his presidential address emphasized on intellectual content of the syllabus, inquisitiveness in the classroom teaching and sincerity and dedication for enriching learning process. He also suggested that teachers must evaluate themselves, explore their weaknesses and discuss cutting edge research areas with the students. He also suggested that we need to

improve the education by upgrading the faculty and exciting the young minds. He also emphasized on gender equity for creating more women leaders. The new areas such as climate change and its influence on biota and in turn on “Blue Economy” must be explored. Ocean is a vast resource and the opportunities must be utilized for the societal benefit. We need to explore the unexplored and develop entrepreneurs for tomorrow. The Blue Economy must flourish as sustainable, responsible and profitable venture. He stated that collaboration and co-ordination is key to success. The Symposium recommendations were discussed and finalized. The program ended with vote of thanks by Dr. N. P. Sahu, Dean (Academics).

National Workshop on “Genetic Improvement of *Clarias magur*: Present Status and Future Prospects” and Interactive Meet with Farmers

A two days’ National Workshop on “Genetic Improvement of *Clarias magur* present status and future prospects” and an ‘Interactive Meet with Farmers’ was organized at ICAR-CIFE, Balabhadrapuram, Kakinada Centre on 15-16 March 2019 under the aegis of National Agricultural Higher Education Project (NAHEP) for sharing the achievement of the Genetic Selection of Magur project and also to bring about the awareness on the genetically improved strain of magur. Magur, selective breeding programme was initiated in the year 2012 with an objective to improve the



harvest body weight. The main objective of this national workshop was to discuss the progress of the project and stream line the selective breeding program to achieve the set goal.

On 15 March, 2019, Dr. Ambekar Eknath, Former D. G. Network of Aquaculture Centers in Asia-Pacific (NACA) chaired the inaugural programme. Dr. Y. Basavaraju Former Dean CoF Mangalore was the co-chair. Dr. Shrinivas Jahageerdar presented the work carried on magur selective breeding programme, he also listed the swot analysis, experiences gained and the future plans of the program. During the workshop key issues related to magur culture, nutrition, diseases were also discussed. Dr. Gopal Krishna, Director ICAR-CIFE, Mumbai, during his address emphasised on the planning for dissemination of the improved strain. A number of scientists, representatives from industries, researchers and farmers attended the workshop.

At Balabhadrapuram, Dr. Gopal Krishna, Director ICAR-CIFE interacted with the local farmers of Balabhadrapuram fishermen co-operative society and distributed improved magur seed variety and released Pengba fish seed in co-operative society's village pond.

On 16 March, 2019 an interactive meet with farmers was organized at ICAR-CIFE, Balabhadrapuram, Kakinada Centre. The farmers meet was aimed to create the awareness about the genetically improved magur among all stake holders farmers and also to exchange the knowledge and ideas on genetic selection of the magur and its culture. A total of 250 farmers, researchers, government officials attended the meeting. Dr. Ambekar Eknath, Former D.G. Network of Aquaculture Centres in Asia-Pacific (NACA) inaugurated the meet. Dr. Shrinivas Jahageerdar, (Project P.I.) explained the magur genetic selection program and replied to the queries raised by the participants. Dr. K. Gopal Rao, Former Dean, SVVU, Tirupati and other scientists and progressive farmers shared about the experience on various aspects of magur culture which was followed up by a question answer session. As part of the meet a poster session explaining about the genetic selection program of the magur and various aspects of culture was also organised. A guided tour of the farm was also conducted for all the participants.



POSH-Workshop on “Discrimination and Harassment at Workplace”

Under the aegis of National Agricultural Higher Education Project-Centre for Advanced Agricultural Science and Technology (NAHEP-CAAST), ICAR-CIFE, Mumbai organised a one-day workshop on “Discrimination and Harassment at Workplace” on 17th November 2018, in association with “POSH (Prevention of Sexual Harassment) At Work”, empanelled by Ministry of Women and Child Development, Govt. of India. The workshop was aimed to create awareness among staff and students of ICAR-CIFE regarding incidences of discrimination and harassment at workplace, their impact and consequences. POSH At Work has been founded with the motto to help in prevention of sexual harassment at workplace. It provides regular legal updates and assistance in complying with law. Ms. Shivangi Prasad, criminal lawyer and co-founder of POSH At Work was the key speaker invited for the event. She is also an external member and legal consultant for Women Harassment Committee of ICAR-CIFE. Dr. Gopal Krishna, Director/Vice-Chancellor, ICAR-CIFE, formally welcomed her and then she delivered a presentation on various dimensions of harassment and discrimination at workplace. Two consecutive sessions were conducted – the first one for scientific, administrative and technical staff of ICAR-CIFE and second one exclusively for ICAR-CIFE students. Both the sessions witnessed a very active participation by the staff and students with healthy discussions in both sessions. The event was fruitful and many such events will be conducted by the Institute in the near future. r



11.2. Important Meetings

S.No.	Meeting	Date
1.	Institute Research Council Meeting	05-07 April, 2018 r
2.	Academic Council Meeting	15 September, 2018 r
3.	Hindi Unicode Karyashala	26 September, 2018 r
4.	Interface Review Meeting of World Bank-ICAR National Agricultural Higher Education Project r	13 November, 2018 r
5.	23 rd Extension Council Meeting	30 November, 2018 r
6.	Syllabus Revision and Academic Reformation in Higher Fisheries Education r	18-19 February, 2019 r
7.	External Audit for ISO Certification	21 February, 2019 r
8.	Research Advisory Committee Meeting	02-03 March 2019 r



11.3. CAFT Programmes/ Winter schools/ Summer Schools Organized

Title	Date	No. of participants
Gene Mining Approaches and <i>In Silico</i> Functional Analyses	03-23 December, 2018	12
Development and Application of Vaccines for Fish Aquaculture	04-13 February, 2019	11
One Health with Special Reference to Fisheries and Aquaculture	18-27 February, 2019	19





Distinguished Visitors





Distinguished Visitors

Dignitaries (International)

Dr. Cherdsak Virapat

Director General, Network of Aquaculture Centres in Asia Pacific (NACA), Thailand
Mumbai HQ-16 May 2018

Dr. S. J. Kaushik

Professor, European Research Area (ERA) – Chair, Spain
Mumbai HQ-16 May 2018; 15 January, 2019

Dr. (Prof.) Kamal Uddin Ahmed

Vice-Chancellor, Sher-E-Bangla Agricultural University, Dhaka, Bangladesh
Kolkata Centre- 21 November, 2018

Prof. Jahangir Alam

Dean, Sher-E-Bangla Agricultural University, Dhaka, Bangladesh
Kolkata Centre- 21 November, 2018

Prof. Keith Criddle

Fisheries Economics, College of Fisheries and Ocean Sciences, University of Alaska, Alaska, USA
Mumbai HQ-21 January, 2019

Dr. Amararatne Yakupitiyage

Professor, Asian Institute of Technology, Thailand
Mumbai HQ-21 January, 2019

Dr. Sootawat Benjakul

Professor, Prince of Songkla University, Thailand
Mumbai HQ-18 May, 2018; 21 January, 2019

Dr. Ayano Barso

President (Vice-Chancellor), Hawassa University, Hawassa, Ethiopia
Mumbai HQ-28 May, 2018

Dr. Zeytu Gashaw

Dean, College of Natural and Computational Science, Ethiopia
Mumbai HQ-28 May, 2018

Prof. P. Natarajan

Professor, Aquatic Sciences and Aquaculture Department of Biology, Hawassa University, Ethiopia
Mumbai HQ-28 May, 2018

Dr. Zufan Bedewi

Professor and Head of Department of Biology, Hawassa University, Ethiopia
Mumbai HQ-28 May, 2018

Mr. Kassaye Balkew

Lecturer, Department of Aquaculture, Hawassa University, Ethiopia
Mumbai HQ-28 May, 2018

Dr. Salin K.R.

Asian Institute of Technology, Bangkok, Thailand
Mumbai HQ-16 May 2018

Ms. Pblkaradampola Gamage Kumudu

Faculty of Fisheries and Marine Sciences & Technology, University of Ruhuna, Wellamadama, Matara, Sri Lanka
Mumbai HQ-16 May 2018

Dr. Md. Aminur Rahman

Rahman Professor
World Fisheries University (WFOU), Pilot Programme, Pukyong National University (PKNU), South Korea
Mumbai HQ-16 May 2018

Dr. Gias Uddin Ahmed

Professor and Dean, Faculty of Fisheries, Bangladesh Agricultural University, Mymensingh-2202, Bangladesh
Mumbai HQ-16 May 2018

Mr. Namga Y Dorji

Program Director, National Research and Development Centre for Aquaculture (NRDCA), Department of Livestock (DoL), Ministry of Agriculture and Forests (MoAF), Royal Government of Bhutan (RGoB)
Mumbai HQ-16 May 2018

Dr. Shyam Narayan Labh

Professor & Head, Department of Zoology, Tribhuvan University, Kathmandu, Nepal
Mumbai HQ-16 May 2018

Dignitaries (National)

Minister of State Government

Shri Mahadev Jagannath Jankar

Hon'ble Minister for Animal Husbandry, Dairy and Fisheries
Government of Maharashtra
Mumbai HQ -16 May, 2018

Shri Prakash Mehta

Hon'ble Minister of Housing
Government of Maharashtra
Mumbai HQ -6 June, 2018

Shri Sadhan Pande

Minister-In-Charge,
Department of Consumer Affairs and Self Help
Group & Self-Employment
Government of West Bengal
Kolkata Centre- 6 October, 2019

Dr. Bharati Lavekar

Hon'ble Member of Legislative Assembly
Government of Maharashtra
Mumbai HQ -6 June, 2018

ICAR, New Delhi**Dr. Trilochan Mohapatra**

Secretary, Department of Agricultural
Research and Education (DARE) &
Director General (ICAR), New Delhi
Mumbai-18 May, 2018; Kolkata Centre-
13 June, 2018; 19 March, 2019

Shri Chhabilendra Roul, IAS

Special Secretary (DARE) & Secretary (ICAR),
New Delhi
Mumbai HQ-26 May, 2018

Dr. J. K. Jena

Deputy Director General (Fisheries Science)
ICAR, New Delhi
Mumbai HQ-16 May, 2018; 2 March, 2019

Dr. N. S. Rathore

Deputy Director General (Agri. Edu.) &
National Director, National Agricultural
Higher Education Project (NAHEP), ICAR,
New Delhi
Mumbai HQ -17 May, 2018;
15 September, 2018 r

Dr. P. K. Ghosh

National Coordinator, National Agricultural
Higher Education Project (NAHEP)
Mumbai HQ-13 November, 2018;
CIFE Rohtak Centre-8 December, 2018

Dr. A. K. Srivastava

Member, Agricultural Scientists Recruitment
Board, New Delhi
CIFE Kolkata Centre-24 November, 2018

Shri Rajan Agrawal

Director (International Cooperation) & CVO
(ICAR)
Department of Agricultural Research &
Education
Ministry of Agriculture, GOI, New Delhi
Mumbai HQ -25 March, 2019

Dr. S. Bhaskar

Assistant Director General (AAF & CC) ICAR,
New Delhi
CIFE Kolkata Centre-23 August, 2018

Dr. G. Venkateshwarlu

Assistant Director General (Edu.), ICAR, New
Delhi
Mumbai HQ-17 May, 2018;
18 February, 2019

Dr. S. Raizada

Assistant Director General (Inland Fy.)
(AAF & CC), ICAR, New Delhi
Kolkata Centre-23 August, 2018

Secretary**Mr. Rakesh Kumar, IAS**

Joint Secretary, Government of India
Kolkata Centre-20 June, 2018

Shri P. K. Mahapatra, IAS

Additional Chief Secretary, Government of
Haryana, Fisheries Department, Chandigarh,
Haryana
Mumbai HQ-26 July, 2018

Dr. Ravi Inder Singh, IAS

Secretary, Fisheries, Government of
West Bengal
CIFE Kolkata Centre- 12 January, 2019

Ms. I. Rani Kumudini, IAS

Chief Executive, National Fisheries
Development Board
Hyderabad
Kolkata Centre-17 August, 2018

Mrs. Esha Sengupta, IAS

Director of Fisheries, Government of
West Bengal
Kolkata Centre-25 March, 2019

Mr. Santanu Saha, IAS

Fisheries Commissioner, Government of
West Bengal
Kolkata Centre-12 January, 2019

Shri Anup Kumar, IAS

Principal Secretary (A.D.F.), Department of
Fisheries, Government of Maharashtra
Mumbai HQ-6 September, 2018

Shri Arun Vidhale, IAS

Commissioner of Fisheries, Government of
Maharashtra
Mumbai HQ-6 September, 2018

Shri Rajendra Jadhav

*Joint Commissioner of Fisheries, Government of Maharashtra
Mumbai HQ-6 September, 2018*

Vice-Chancellor**Dr. (Prof.) S. Felix**

*Vice-Chancellor, Tamil Nadu Dr. J. Jayalalitha Fisheries University,
Thoothukudi, Tamil Nadu
Mumbai HQ-16 May, 2018; 18 February, 2019; CIFE Kolkata Centre-27 July, 2018*

Dr. M. Premjit Singh

*Vice-Chancellor, Central Agricultural University, Imphal
CIFE Kolkata Centre-16 January, 2019*

Dr. C. Vasudevappa

*Vice-Chancellor, NIFTEM, Sonapat, Haryana
Mumbai HQ-17 May, 2018; 18 June, 2018*

Director and Joint Director of ICAR Institutes**Dr. C. N. Ravishankar**

*Director, ICAR- Central Institute of Fisheries Technology (CIFT), Cochin, Kerala
Mumbai HQ -05 February, 2019; 25 March, 2019*

Dr. B. K. Das

*Director, ICAR-Central Inland Fisheries Research Institute (CIFRI), Barrackpore, West Bengal
Mumbai HQ -16 May, 2018; 23 December, 2018; Kolkata Centre-12 October, 2019*

Dr. Kuldeep Kumar Lal

*Director, ICAR-National Bureau of Fish Genetic Resources, Lucknow, Uttar Pradesh
Kolkata Centre-20 May, 2018*

Dr. Abhijit Mitra

*Director, ICAR- National Research Centre on Mithun, Nagaland
Kolkata Centre-7 April, 2018; 20 June, 2018*

Dr S. S. Singh

*Director, ICAR-Agricultural Technology Application Research Institute, Kolkata
Kolkata Centre-10 July, 2018*

Dr. Debjit Sharma

*Director, ICAR-Directorate of Cold Water Fisheries Research, Bhimtal, Uttarakhand
Kolkata Centre-6 October, 2019*

Dr. N. C. Pan

*Director ICAR-National Institute of Natural Fibre Engineering and Technology
Kolkata, West Bengal
Kolkata Centre-19 March, 2019*

Dr. Jiban Mitra

*Director, ICAR- Central Research Institute for Jute and Allied Fibers
Nilganj, Barrackpore, West Bengal
Kolkata Centre-19 March, 2019*

Dr. P. C. Sharma

*Director, ICAR-The Central Soil Salinity Research Institute, Karnal, Haryana
Rohtak Centre-8 December, 2018*

Dr. S. Basanta Singh

*Director (I), Central Agricultural University, Imphal
Kolkata Centre-04 March, 2019*

Special invitees**Padma Vibhushan Dr. Anil Kakodkar**

*Chairman, Rajiv Gandhi Science & Technology Commission, Government of Maharashtra
Mumbai HQ -04 April, 2018; 16 May, 2018
Kolkata Centre-13 June, 2018*

Dr. Ambekar E. Eknath

*Former Director General, Network of Aquaculture Centers in Asia-Pacific (NACA)
Bangkok, Thailand
Mumbai HQ -18 May, 2018; 26 March, 2019*

Dr. S. D. Tripathi

*Former Director, ICAR-CIFE, Mumbai
Mumbai HQ-18 May, 2018;
26 March, 2019*

Dr. Dilip Kumar

*Former Director, ICAR-CIFE, Mumbai
Mumbai HQ-26 April, 2018;
16 May, 2018*

Dr. N. Sarangi

*Former Director, ICAR-CIFA, Bhubaneswar
Mumbai HQ -2 March, 2019*

Dr. T. K. Srinivasa Gopal

*Former Director, ICAR- Central Institute of Fisheries Technology (CIFT)
Cochin, Kerala
Mumbai HQ -2 March, 2019*

Dr. S. Dam Roy

*Former Director, ICAR-CARI, Port Blair
Mumbai HQ -16 May, 2018*

Dr. S. C. Mukherjee

Former Joint Director, ICAR-CIFE, Mumbai
Mumbai HQ -16 May, 2018

Dr. R. S. Biradar

Former Joint Director, ICAR-CIFE
Mumbai HQ-26 April, 2018; 16 May, 2018

Dr. P. Keshavanath

Former Dean, College of Fisheries,
Mangalore, Karnataka
Mumbai HQ -16 May, 2018

Dr. Indrani Karunasagar

Director (R&D), Nitte University, Bangalore,
Karnataka
Mumbai HQ -16 May, 2018; 2 March, 2019

**Commissioner/Chairman/MD/
Director/Deputy Director of State
Fisheries****Dr. C. Suvarna**

Commissioner of Fisheries and Managing
Director, Telangana State Fishermen
Cooperative Societies Federation (TSFCOF),
Telangana
Kakinada Centre- 24 October, 2018

Shri Rama Shankar Naik

Commissioner of Fisheries, Andhra Pradesh
Kakinada Centre-20 January, 2019

Shri R. K. Sangwan

Director, Fisheries Department, Government of
Haryana, Chandigarh
Mumbai HQ-26 July, 2018

Shri O. P. Saxena

Director, State Fisheries Department,
Government of Madhya Pradesh
Kolkata Centre-13 March, 2019; Powarkheda
Centre-19 November, 2018

Dr. Sharad Jaykumar Tombri

Founder of "KO" Foodko Products &
CEO of Indian Home Gourmet
Mumbai HQ -25 March, 2019

Dr. S. Jacob

Joint Director, Export Inspection Council,
India
Mumbai HQ-19 February, 2018

Mrs. Rowena Pinto

Proprietor of Judes Food Products, Mumbai
Mumbai HQ- 25 March, 2019

Mr. Karthik Ramesh

Program Manager (Fisheries), TATA Trusts,
Mumbai
Mumbai HQ -25 March, 2019

Dr. Azad Dubey

Director, Blue Vision Aquaculture, Gujarat
Mumbai HQ -25 March, 2019

Mr. Arun Kumar R.

General Manager (Technical), RNK Agro &
Chemical Pvt. Ltd., Andhra Pradesh
Mumbai HQ -25 March, 2019

Mr. Bidhan Das

Deputy Director and Branch Head,
Indian Institute of Packaging, Kolkata
CIFE Kolkata Centre-06 March, 2019

Mr. Shibashish Das

Branch Manager, Industrial Development Bank
of India, Barasat, West Bengal
CIFE Kolkata Centre-09 March, 2019

Shri U. S. Tomar

Former Joint Director, State Fisheries
Department, Government of Madhya Pradesh
CIFE Kolkata Centre-11 March, 2019

Mr. Gangesh Kumar Varma

Director, Varma Ocean Product (P) Ltd.,
Kolkata, West Bengal
Kolkata Centre-19 March, 2019

Mrs. Subhalaxmi Das Banerjee

Project Former Coordinator, Marine Products
Export Development Authority, Kolkata
Kolkata Centre-19 March, 2019

Mr. Archiman Lahiri

Deputy Director, Marine Products Export
Development Authority, Kolkata
Kolkata Centre-20 March, 2019

Mr. Atanu Ray

State Coordinator, NETFISH, Marine Products
Export Development Authority, Kolkata
Kolkata Centre-20 March, 2019

Dr. M. Kalshetti

District Collector, Nandurbar, Maharashtra
Mumbai HQ -15 December 2018

Shri Devendra Mewadi

Scientific Book Writer
Mumbai HQ-26 February, 2019



Others



13.1. Agricultural Education Day

The agricultural education day was celebrated at ICAR-CIFE, Mumbai on 3 December, 2018. Dr. Gopal Krishna, Director ICAR-CIFE, gave a thoughtful insight into the modernization of fisheries education and invited innovative suggestions from the students. Dr. N.P Sahu, Dean Academics, emphasized on the need to expedite the reforms in fisheries education in order to meet the projected fish production in India by 2050 and also to alleviate nutritional deficiency by making fish available to everyone. In this context, a speech competition was organized for the students in which twenty-three students participated. The students made a critical evaluation of agricultural education in general and fisheries in particular, and provided innovative suggestions to improve fisheries education to meet the requirements of students and farmers.



The gist of discussion was that it is important to induct competitive and motivating teachers, who can instill interests in students to take up challenges in the field. Focus should be placed on farmer-friendly technologies. Farmers should be included in the education process and the institutions should closely work with farmers and industries. Extension activities in India in fisheries field should be intensified to establish a direct link between fisheries education, research and the stakeholders. Improvements in traditional farming is necessary, which can be accomplished by technology dissemination. The gap between classroom teaching and field experience needs to be effectively bridged by devising programs that expose students to practical problems in the field and motivate them to take up research work to solve those problems.

The education system requires reforms to train students in the field of their interest. A well-balanced education should create scientists, farmers and entrepreneurs, among the students. Modernization of infrastructure in fisheries institutes will tremendously improve the quality of research and the students as well. Fisheries subjects should be introduced from the primary level to motivate young students to take up higher education in fisheries. Student visits, exhibitions, symposia and conferences should be organized to popularize fisheries education. The number of Fisheries Universities should be increased to cater to the increasing demand for professional fisheries graduates.

13.2. World Environment Day

On 5 June, 2018 ICAR-CIFE celebrated World Environment Day by planting trees in the campus. The Director of the Institute, along with senior faculty members, officers, staff and students participated in the event and planted about two dozen saplings.



13.3. 57th Annual Day

ICAR-Central Institute of Fisheries Education, Mumbai, celebrated its 57th Annual Day on 6 June, 2018. Shri. Prakash Mehta, Hon'ble Minister of Housing, Govt. of Maharashtra, graced the occasion as Chief Guest. Mrs. Bharathi Lavekar, Hon'ble M.L.A., Versova, Mumbai, was the Guest of Honour. Dr. Gopal Krishna, Director & Vice-Chancellor, ICAR-CIFE



welcomed the chief guest, dignitaries, and other guests. In his welcome address, he briefed the achievements made by the institute in academics, research and human resource development. He highlighted the flagship programme on inland saline aquaculture as well as other outreach programmes undertaken by the institute recently. He presented the institute's vision for the next two decades and the existing collaborations with various national and international Universities.

The Chief Guest, in his address appreciated the infrastructure development and contribution of ICAR-CIFE in HRD in the field of fisheries. He emphasized the importance of growth in agriculture and fisheries for the economic growth of the country, and assured all support needed from his ministry for the welfare of fisheries sector. The annual institutional awards in various categories like Best Scientist, Best Teacher, Best Extension Scientist, etc. and letters of appreciation to the deserving staff for their outstanding contribution towards the growth of institute were distributed by the Chief Guest. A cultural program was organized in the afternoon in which the staff, students, and family members of CIFE staff participated enthusiastically. The programme ended with a vote of thanks by Dr. N. P. Sahu, Dean (Academics).

13.4. International Yoga Day

ICAR-Central Institute of Fisheries Education, Mumbai celebrated 4th International Yoga Day on 21 June, 2018. Staff and students of CIFE participated in the programme. CIFE



organized a Yoga workshop on the theme “Yoga for peace and harmony” in the auditorium hall. The programme started with an inaugural address by Dean (Academics) Dr. N. P. Sahu, who emphasized on the importance of yoga for gaining inner strength and mental peace. The programme was coordinated by Dr. Megha Bedekar and Ms. Husne Banu. Yoga instructor was Mrs. Sayali Jadhav.

The workshop started with prayer as per Common Yoga Protocol given by the Ministry of AYUSH. The Instructor explained the importance of yoga to relieving the stress in day to day life. After this, some sukshama vyayam like asana for neck, back and hands, taada asana, Vakra asana, shashank asana and pranayama were demonstrated by trainer, Mrs Sayali Jadhav and two volunteers from students, Mr. Siva Guru Nathan and Miss Nuzaiba. Asanas were practiced and performed by all staff and students under the guidance of instructor. Benefits and contraindications of all the asana were also explained. The workshop ended with chanting of “Omkar” followed by a vote of thanks.

13.5. 72nd Independence Day

ICAR-Central Institute of Fisheries Education, Mumbai and its regional centres (Rohtak, Haryana; Kakinada, Andhra Pradesh; Kolkata, West Bengal; Powarkheda, Madhya Pradesh and Motipur, Bihar) celebrated 72nd Independence Day of India on 15 August, 2018 amidst earnest fervor and patriotic spirits. The Institute was illuminated on the occasion and the Indian tricolor was unfurled in the university campus. Speaking on the occasion, the Director and Vice Chancellor, Dr. Gopal Krishna highlighted the Institute's contribution for

the sector and national priorities of blue revolution and farmers' income. He stressed upon integrating research with society and passing its benefit to all communities ignoring caste, creed and religion. He



congratulated the CIFE parivar on achieving the coveted 7th rank amongst all Agricultural Universities in the country owing to excellence in academics and cutting edge research. Patriotic songs by students and staff enthralled the audience and set the mood for this important National day. The highlight of the occasion was the plantation by the guests and dignitaries. The competitive sporting events evoked lot of fun and team spirit among the students and staff. The cricket match between CIFE staff and Export Inspection Agency (EIA), Govt. of India received applause as a grand finale for the day. Smiling faces added cheer to the day as all the centres of the institute also joined hands to host awareness programs, sporting and cultural events to commemorate the day. r

13.6. Swachhta Abhiyaan and Gandhi Jayanti Celebration

Staff and students of ICAR-CIFE, Mumbai and its Centres participated in two Swachhta Pakhwadas organized during 2018-19. These were organized from 16 September- 2 October, 2018 and 16 -31 December 2018. Apart from this, various other programs related to cleanliness were organized every month. Competitions like speech and elocution, poster and slogan making, Best from Waste, etc. were organized for the students of CIFE, staff children, neighbouring municipal schools and staff.



Students spread the message of avoiding plastic use and adopting a clean lifestyle by display of banners, marches and clean-up drives. The events were designed to have the participation of the whole Institute and the message of cleanliness was also spread amongst the neighbouring areas and villages. "Swachcha Bharat Pakhwada" was also observed in all the centres. The *Safai Abhijan* on different dates were undertaken under the leadership of different scientists/staffs of the Centre, where all staff, students and trainees participated voluntarily and actively. The boys hostel, main administrative office, guest house, library, wet lab, ornamental fish research unit, staff quarter and ladies hostel were cleaned up thoroughly. On 2nd October, 2018 plantation programme within the campus was organized by ICAR-CIFE Kolkata Centre which was followed by closing ceremony where individual scientists/staffs expressed their views regarding the programme and promised to keep the Centre and its surroundings clean.

Mahatma Gandhi Jayanti was commemorated in the institute on 2nd October, 2018 at the commencement of the 150th year of Babu's birth. Dr. Gopal Krishna Director of the institute congratulated all the staff and students and hoped that they would do their job with full devotion and social dedication. Mr. Paramjit Singh, who is the founder of "Dharma Bharti Mission" a non-governmental organisation committed to social work was the Chief Guest of the program. He encouraged the students to rise from their own personal problems and identify their social responsibilities and take firm measures to achieve the goal of social

equality. On this occasion, Dr. S. N. Ojha, Head of FEES, Department gave an interesting speech on Mahatma Gandhi's socio-economic views. Dr. Aparna Chaudhari, Convener of the Swachhta Abhiyaan at CIFE, announced the “Best Organizer” prizes. Dr. Kundan Kumar and Dr. Sikendra Kumar won the I Prize and Dr. Paramita Sawant and Dr. Manjusha L. won the II prize. On this occasion, staff and students sang Mahatma Gandhi's favourite bhajans and also performed a short play.

13.7. National Fish Farmers' Day

ICAR-CIFE, Kolkata Centre celebrated National Fish Farmers' Day to commemorate the discovery of induced breeding technology of fish. About 70 fish farmers belong to nine different districts of West Bengal, and Andhra Pradesh including women fishers participated in the interaction with the faculties and farmer experts on the prospects and problems of diversified aquaculture systems. An exhibition was organized involving eight companies for displaying various products related to aquaculture and processing. Shri, Sadhan Pande, Minister-in-Charge, Department of Consumer Affairs and Self Help Group & Self-Employment, Government of West Bengal, graced the occasion as Chief Guest.

13.8. Communal Harmony Day

CIFE observed Communal Harmony Day on 22 November, 2018 by celebrating the 'Unity in Diversity' spirit of India. ICAR-CIFE is a national university and



resembles 'Mini India' as students come from all over the country. The Vice-Chancellor of the Deemed University Dr. Gopal Krishna alongwith faculty members, staff and students participated in the program. Several students came dressed in the traditional clothes of their regions. The auditorium was filled with different colours of India. Dr. Aparna Chaudhari coordinated the event where students narrated stories related to various festivals of India. Brightly dressed students talked enthusiastically about the importance of various festivals and how they are

celebrated in their States. The festivals included 'Barsana Holi' from Mathura, Uttar Pradesh, 'Lohri' from Punjab, 'Onam' from Kerala, 'Ugadi' from Karnataka, 'Phool Dei' from Uttarakhand, 'Chath Pooja' from Bihar, 'Kati Bihu' from Assam, 'NingolChokuba' from Manipur, 'Eid' and 'Easter'. In his remarks the Director told how the national festivals Independence Day and Republic Day are most important reminders of our unity and of all that we have achieved on account of it. He emphasized that feelings of love, harmony, tolerance and pride in our diversity are desirable among all members of CIFE Parivaar.



13.9. National Productivity Week

ICAR-Central Institute of Fisheries Education celebrated National Productivity Week (12-18 February, 2019) as per the directive of the National Productivity Council (NPC) and ICAR, with the theme “Circular Economy for Productivity and Sustainability”. The event was aimed on creating awareness among students, faculty, staff and other stakeholders about a paradigm shift from

linear to the concept of circular economy, resulting from the efficient utilisation of resources. A series of lectures by experts were organised on the occasion along with a drawing competition for school children to sensitize the next generation on ways of reducing, reusing and recycling wastes generated from agriculture and allied sectors, thereby contributing towards a productive economy. Dr. K. K. Krishnani, Dr. Kiran Dube Rawat and Dr. S. N. Ojha, Principal Scientists, expressed their viewpoints on creating a waste free economy through integrated aquaculture and wealth from waste through reclamation of degraded soils by inland saline aquaculture. This was followed by an art competition, for students of Versova Welfare Association High School, Versova, Mumbai wherein, school children expressed their viewpoints on the theme of circular economy through charcoal and pastel strokes on art paper. Two best students were awarded winner and runner up and certificates were distributed to all participants under the supervision of Dr N. K. Chadha and Dr. S. N. Ojha, Heads of Divisions of Aquaculture and Fisheries Economics, Extension & Social Sciences, ICAR-CIFE, Mumbai.

13.10. Inauguration of Solar-powered Cooler

Dr. Gopal Krishna, Director & Vice Chancellor inaugurated the solar-powered fish cooler developed by the Post Harvest Technology department of ICAR-CIFE under the project “Feasibility study of using solar powered cool boxes to improve shelf life and hygiene of fish sold in retail markets in Mumbai”. The project is funded by Rajiv Gandhi Science and Technology Commission (RGSTC), Maharashtra. Dr. Sanath Kumar H and Dr. Binaya Bhusan Nayak developed the cooler under the project.



The solar fish cooler can hold 50 kg of fish. Powered by two solar panels, the system has a battery to store power. The cooler can achieve a temperature of -20°C . However, fish intended to be sold in retail market can be stored at $0-5^{\circ}\text{C}$, which will lower the consumption of power and prolong the storage period. Solar-powered cooler is expected to reduce the dependency on ice, prolong the shelf life and ensure the quality and hygiene of fresh fish sold in the retail markets.

13.11. Ganesh Chaturthi

Ganesh Chaturthi was celebrated at Ph.D. boy's hostel of ICAR-CIFE, under the guidance of Director Dr. Gopal Krishna on September 13, 2018. The deity, decorated in color and shine made the campus sparkingly divine. The celebrations concluded with a grand Visarjan procession to Versova beach.

13.12. Freshers' Day

The freshers day was celebrated in October 9, 2018. Students from across the country who joined ICAR-CIFE were invited to this programme with all love and joy. Director Dr. Gopal Krishna along with CIFE faculty graced the occasion. Mr. Sambit Priyadarshi (academic council representative- PGSSU) coordinated the function along with the PGSSU members. Freshers from various departments exhibited their talents with songs, dance, music and plays. Prizes were distributed to the winners. The Best Division Award was bagged by Fish Genetics and Biotechnology Division. Mr. Shubham and Ms. Kangkana won the Mr. Fresher and Ms. Fresher prizes, respectively.



13.13. All India Fisheries College Cultural and Sports Meet

The two days all India fisheries college cultural and sports meet, 2018 was held at college of fisheries, Mangalore. Students of ICAR-CIFE participated in the event and won first prize in debate, quiz, chess, badminton and table tennis.

13.14. Christmas Celebration

CIFE-PGSSU organized Christmas Celebrations on December 25, 2018 in the university campus. The programme was inaugurated by the Director Dr. Gopal Krishna in the presence of staff and students. The programme was made colorful by the performances of CIFE students. A play performed by the students on the birth events of Jesus Christ enthralled the audience.

13.15. Annual Sports Week

The annual sports week at ICAR-CIFE was conducted during December 22-28, 2018. Dr. Gopal Krishna, Director flagged off the sports week and delivered the inaugural address. Various sports events were held in outdoor games including

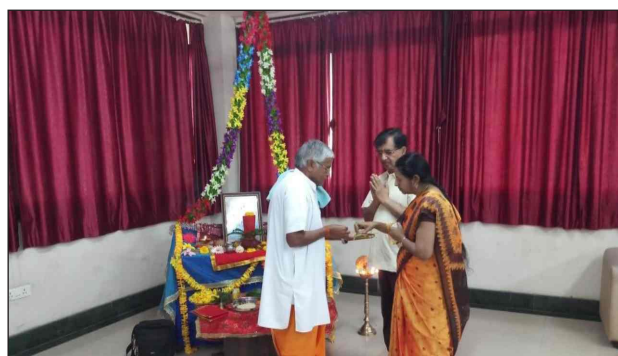
javelin, shot-put, long jump, discus throw, slow cycling, kho-kho, kabaddi, basketball, volley-ball, cricket and football for girls and boys separately. Indoor games like badminton, table tennis, chess, and carom were conducted in different categories like singles, doubles and mixed doubles.

13.16. New Year Celebration 2019

The newly elected CIFE PGSSU debuted by hosting the New Year celebration 2019. The programme started with a short film reminiscing the year 2018. Interesting games and entertainments were organized by the cultural committee for the faculty and the students. Director Dr. Gopal Krishna inaugurated the programme with a cake cutting ceremony. The entire ICAR-CIFE joined celebrations cheerfully welcoming 2019 while bidding adieu to 2018.

13.17. Pongal Celebration

The "Harvest Festival" Pongal was celebrated at ICAR-CIFE on January 14, 2019. On this occasion, students from Tamil Nadu put an outstanding *rangoli* at CIFE new campus. All students and staff celebrated the festival in a traditional style.



13.18. All India Inter-agri university sports and games meet

Students of ICAR-CIFE participated in the XIX All India inter agri university sports and game meet at Punjab Agricultural University, Ludhiana, Punjab during 2-5th January, 2019 r

13.19. Saraswati Puja

Saraswati Puja was held in ICAR-CIFE's boys hostel on February 10, 2019. Students participated in the programme in traditional dresses. Following offerings to the deity, sweets were distributed to students and staff present at the venue.

13.20. Holi Celebration

The festival of colors, Holi was celebrated at ICAR-CIFE on March 20, 2019. The celebrations began with lighting a huge pyre on 20th night. The staff and students of ICAR-CIFE participated in the "Holi ka Dahan".

The following morning, everyone enjoyed the celebration by splashing colors at each other. Considering scarcity of water and to be an eco-friendly celebration, dry Holi without water was celebrated on 21st March. r

13.21. Lectures Delivered under Science Club Activity

Name of the faculty	Designation	Title of lecture	Date
Paramita B. Sawant	Senior Scientist	Pond preparation, and rearing of implanted mussels	22 June, 2018
Vidya Shree Bharti	Scientist (SS)	Management of sediment and water quality for enhancement of productivity	5 December, 2018
Kiran Dube	Principal Scientist	Cage culture options for rearing fingerlings in reservoirs in training programme on Recent Advances in Aquacultural Engineering	22 February, 2019
Kiran Dube	Principal Scientist	Ornamental fish culture in cages: a new venue in ornamental fish culture in training programme on Advances in aquarium management techniques	11 January, 2019
Kiran Dube	Principal scientist	Cage culture options for rearing fingerlings in reservoirs for training programme Basics in Aquaculture	23 January, 2019
Paramita B. Sawant	Senior Scientist	Monitoring of water quality in cages	31 January, 2019 r





CIFE Headquarters, Mumbai

RMP

Director

Dr Gopal Krishna r

Joint Director

Scientific Staff

Head of Division

Dr N. K. Chadha r
Dr K. V. Rajendran r
Dr (Mrs) Aparna Chaudhari r
Dr B. B. Nayak r
Dr S. N. Ojha (In-charge) r
Dr N. P. Sahu (In-charge 29.12.2018) r

Principal Scientist

Dr K. K. Jain (upto 30.06.2018)
Dr Neelam Saharan
Dr (Mrs) Kiran Dube Rawat
Dr (Mrs) Latha Shenoy
Dr Naresh S. Nagpure
Dr Geetanjali Deshmukhe
Dr P. K. Pandey (on deputation)
Dr Kishore Kumar Krishnani
Dr S. Jahageerdar
Dr V. K. Tiwari
Dr (Mrs) Arpita Sharma
Dr K. Pani Prasad
Dr P. P. Srivastava
Dr R. P. Raman
Dr Parimal Sardar
Dr Ashok Kumar Jaiswar
Dr Rupam Sharma
Dr (Mrs) Gayatri Tripathi
Dr Satya Prakash Shukla
Dr Swadesh Prakash
Dr Subodh Gupta
Dr Mukunda Goswami
Dr Ashutosh D. Deo
Dr (Mrs) Megha Kadam Bedekar

Senior Scientist

Dr (Mrs) Zeba Jaffer Abidi r
Dr Asha T. Landge r
Dr Ajit Kumar Verma r
Dr P. S. Ananthan r
Dr Sanath Kumar H
Dr (Mrs) Rama Sharma r
Dr A. K. Balange r
Dr (Mrs) Paramita Banerjee Sawant r
Dr (Mrs) Babita Rani A. M
Dr A. Pavan Kumar r
Dr Gireesh Babu Pathakota r

Scientist

Dr (Mrs) Vidyashree Bharati r
Dr Kundan Kumar r
Mr Vinod Kumar Yadav r
Dr (Mrs) Manjusha L
Dr Martin Xavier K. A r
Dr Sikendra Kumar r
Dr (Mrs) Jeena K r
Dr Saurav Kumar r
Dr (Mrs) Tincy Verghese r
Dr Mujahidkhan Ajamalkhan Pathan r
Dr Shashi Bhushan r
Dr (Mrs) Shamna N r
Mr Dhamotharan K (on study leave) r
Mr Karankumar K. Ramteke r
Dr (Mrs) Rathi Bhuvaneswari G r
Dr Shivaji Dadabhau Argade
Ms Layana P r
Mr Manish Jayant r
Ms Neha Wajahat
Mrs Husne Banu r
Mr Angom Lenin Singh r
Ms Upasana Sahoo
Ms Madhuri Pathak

Technical Staff

Chief Technical Officer (T-9)

Mr R. D. Tandel (till 31.05.2018) r
Dr S. K. Pandey r
Mr Alkesh Dwivedi (till 31.05.2018) r
Dr M. K. Chouksey (till 19.05.2018 and
rejoined on 11.02.2019) r
Mr S. S. Kamat r
Mr D. R. Khogare
Mr S. K. Sharma
Mr Ram Singh r

Asst. Chief Technical Officer (T-7/8)

Dr Chandrakant M. H.
Mr Dasari Bhoomaiah
Mr P. K. Das
Dr (Mrs) Nalini Poojary
Mr Subhash Chand
Ms Revati B. Dhongde (From 28.06.2016)
Ms Rekha Nair (from 28.06.2016)

Sr. Technical Officer (T-6)

Mr C. B. Kareer
Mrs Rajani H. Khandgale
Mr Sanjeevan Kumar

Technical Officer (T-5)

Mr B. G. Mandhare
Mr J. M. Koli
Mr S. Maity
Mr B. J. Rathod
Mr N. K. Aglave
Mr S. R. Bandkar
Mrs Bharati Ghagare
Mr Avinash Sable
Mr Suryakant L. Koli
Mr B. T. Phande
Mr Anil Kumar Kulsange

Sr. Technical Assistant (T-4)

Mr Sagar Suresh Sawant
Mr Rajarshee Moitra
Mr Yogesh Jadhao
Mr K. Dhana Raju
Dr Pawan Kumar
Mr Mohd. Baqar
Mr A.P. Dhawde
Mr Sikandar S. Hussain
Mr K. V. Rajendran
Mr V. G. Dhindore
Mr Arun Puri Gosavi
Mr R. D. Deshmukh

Technical Assistant (T-3)

Ms Reshma K. Raje
Mr Dhanpat Singh Rawat
Mr V. K. Bhawe

Sr. Technician (T-2)

Mr Pranaya Kumar Biswal r

Technician (T-1)

Mr Mohd Sadiq M. Mulla r
Mr Abhijeet Vijay Jadhav r
Mr T. G. Gaikwad r
Mr G. B. Kamble

Non-Ministerial Staff

Cook

Mr S. Kamaraju r

Administrative Staff

Chief Finance & Accounts Officer

Mr Prashant Sharma

Sr. Administrative Officer

Mr Mahesh B. Khubdikar

Dy. Director (Official Language)

Dr R. P. Uniyal

Asst. Director (Official Language)

Mr Devendra Kumar Dharam

Finance & Accounts Officer

Mr Rahul Kumar

Asst. Finance & Accounts Officer

Mr Deepak M. Bhokse (from 17.05.2018) r

Administrative Officer

Asst. Admn . Officer

Ms Sushma Singh
Ms Poonam N. Behl
Ms F. G. Fernandes
Ms C. S. Khundol
Mr D. S. Ingale

Private Secretary

Mr P. R. Ninawe

Personal Assistant

Ms Pragati R. Gadre r

Stenographer (Grade – III)

Assistant

Mr R. R. Kadam r
Mrs Swati S. Koli r
Mr V. S. Kuveskar r
Mr Suraj Gupta r
Mr D. V. Raorane r
Ms A. U. Joshi r
Mr A. G. Kolambkar r
Ms S. V. Pawar r
Ms Sanyuja S. Parab
Mr B. P. Chauhan (from 17.01.2019) r
Mr N. L. Ghane (from 17.01.2019) r

Upper Division Clerk

Mr P. G. Angne r
Mr M. B. Waghela r
Ms C. C. Raut r
Ms Anu Grover r
Mr S. H. Bhosale

Lower Division Clerk

Mr Shirish P. Malvankar
Mr R. N. Kamble
Mr Prasenjit P. Sonawane
Mr Ram A. Shinde
Mr Ninad V. Kandalgaonkar

Skilled Support Staff

Mr B. N. Sukur (upto 31.01.2019)
Mr G. G. Zendeckar
Mr Surajbali R. Jaiswar
Mr B. S. Tamankar
Mr Ashok R. More
Mr D.B. Gaikwad
Mr Sitaram B. Padyal
Mr J. K. Makwana
Mr Bandu R. Chavan
Mr Ankush R. Dore
Mr M. P. Kotian
Mr Ashok R. Shingade
Mr Jagdish N. Dhanu
Mr Vasant N. Ondkar
Mr Arvind M. Lavande
Mr Vinod Kumar Yadav
Mrs R. H. Chavan
Mr Ankush N. Joyashi
Mr Ganesh N. Zendeckar
Mr Anil D. Sonawane
Mr Fakirmayan U. Mullaji
Mr Sambhaji S. Shelke
Ms Reshma Naik
Ms Revati Venkateshvaran (upto 31.05.2018)
Mrs Ujjawala V. Tiwari
Ms Sabita Devi



CIFE Kakinada Centre

Officer In-charge and Senior Scientist

Dr Muralidhar P. Ande r

Scientist

Dr Karthireddy Syamala r
Dr Arun Sharma r
Dr Thongam Ibemcha Chanu r

Chief Technical Officer (T-9)

Dr J. K. Prasad r
Dr P. Srinivas Rao
Mr V. N. Acharyulu r

Asst. Chief Technical Officer (T-7/8)

Mr R. R. S. Patnaik r

Sr. Technical Assistant (T-4)

Mr M. Satyanarayana (upto 30.04.2018)

Sr. Technician (T-2)

Mr A. Gurraiah r
Mr. V. Shivaji (From 15.06.2018) r

Technician

Mr Sheikh Valisha
Mr G. V. V. Satyanarayana

Assistant

Mr B. Laxman Rao r

Upper Division Clerk

Ms M. Rama Mani r

Skilled Support Staff

Mr Sheikh Nana Saheb (upto 31.07.2018) r
Mr K. Niranjana (upto 31.07.2018) r
Mr K. Prasad r
Mr O. Veera Raju r
Mr T. Satyanarayana r
Mr P. V. K. Reddy r
Mr P. D. Reddy r
Mr S. S. Reddy r
Mr Y. Buchilingam r
Mr M. Govindu r
Mr Kurru Suresh (from 21.08.2018) r



CIFE Kolkata Centre

Officer In-charge and Principal Scientist
Dr G. H. Pailan r

Principal Scientist
Dr B. K. Mahapatra r
Dr Shubendu Dutta r
Dr S. Munil Kumar r
Dr S. Das Gupta r

Scientist
Dr Sujata Sahoo r
Mr Dilip Kumar Singh r

Chief Technical Officer (T-9)
Dr Asok Biswas

Technical Officer (T-5)
Mr P. K. Patra r

Sr. Technical Assistant (T-4)
Mrs G. Aruna Devi r
Mr Prakash Kumar Behera r
Mr Tapas Kumar Ghosh r

Private Secretary
Ms Kaberi Biswas

Assistant
Mr C. N. Sahani
Mr P. K. De

Upper Division Clerk
Mr Kishore Bose
Mr Ram Milan Singh (from 18.01.2019) r

Skilled Support Staff
Mr R. N. Prasad (upto 30.06.2018) r
Mr Ramesh Chowdhary r
Mrs Suman Pandey r
Mr. Rajesh Mahato (from 28.08.2018) r



CIFE Rohtak Centre

Officer In-charge and Scientist
Mr Hari Krishna

Scientist
Mr Arun Sudhagar S. (on Study Leave) r
Mr Pankaj Kumar r
Dr Sreedharan K. r
Mr Satya Prakash r

Sr. Technical Officer (T-7/8)
Mr Ashok Kumar

Sr. Technical Assistant (T-4)
Mr Satyendra Singh
Mr Lokesh Kumar

Technical Assistant (T-3)
Mr Krishan Kumar

Technician (T-1)
Mr Lavesh Kumar r

Skilled Support Staff
Mr Gyani Ram r
Mr Gyan Chand r



CIFE Powerkheda Centre

Officer In-charge and Scientist

Dr Sunil Kumar Nayak r

Scientist

Mr. Dhalongsai Reang

Chief Technical Officer (T-9)

Dr R. K. Upadhyay (upto 31.12.2018)

Asst. Chief Technical Officer

Mr L. P. Bamalia r

Sr. Technical Officer (T-6)

Mr Hasan Javed

Technical Officer (T-5)

Mr Gurubachan Singh r

Sr. Technical Assistant (T-4)

Mr Anup Singh r

Sr. Technician (T-2)

Mr Raghuvir Prasad r

Technician (T-1)

Mr S. Prajapati

Asst. Administrative Officer

Ms Asha Dhurve

Skilled Support Staff

Mr Lallu Prasad

Mr Vishnu Lal

Mr Mangli Prasad

Mr Sambhu Dayal

Mr Hari Singh

Mr Manohar Lal

Mr Ram Swarup

Mr Deepak Kumar Kushwaha (from 25.08.2018)



CIFE Motipur Centre

Officer In-charge and Scientist

Dr Mohd. Aklakur

Appointments

S. No.	Name of the Officials	Designation	Date of Joining
1	Mr Deepak M. Bhokse	Asst. Finance & Accounts Officer	17.05.2018
2	Mr Kurra Suresh	Skilled Support Staff	21.08.2018
3	Mr Deepak Kumar Kushwaha	Skilled Support Staff	25.08.2018
4	Mr Rajesh Mahato	Skilled Support Staff	28.08.2018

Transfers to CIFE

Sl. No.	Name of the Employee	Transfer From	Date of Relieving
1	Dr Kishore Kumar Krishnani	NIASM, Baramati	30.06.2018

Retirements/Resignation

S. No.	Name of the Employee	Designation	Date of Retirement
1	Mr M. Satyanarayana	S.T.A, Kakinada Centre	30.04.2018
2	Mr R. D. Tandel	Chief Tech. Officer	31.05.2018
3	Mr Alkesh Dwivedi	Chief Tech. Officer	31.05.2018
4	Mrs. Revathi Venkateshwaran	SSS, CIFE HQ	31.05.2018
5	Dr K. K. Jain	Principal Scientist	30.06.2018
6	Mr R. N. Prasad	SSS, Kolkata Centre	30.06.2018
7	Mr Shaikh Nana Saheb	SSS, Kakinada Centre	31.07.2018
8	Mr K. Niranjana	SSS, Kakinada Centre	31.08.2018
9	Dr R. K. Upadhyay	CTO, Powarkheda Centre	31.12.2018
10	Mr B. N. Sukur	SSS	31.01.2018

Career Advancement Scheme for Promotion

Senior Scientist to Principal Scientist

S. No.	Name of the Employee	From	To	w.e.f.
1	Dr Ashutosh D. Deo	Sr. Scientist	Principal Scientist	12.05.2017
2	Dr Megha Kadam Bedekar	Sr. Scientist	Principal Scientist	28.12.2017

Scientist to Senior Scientist

1	Dr Annam Pavan Kumar	Scientist	Senior Scientist	07.01.2018
2	Dr Gireesh Babu Pathakota	Scientist	Senior Scientist	26.06.2017
3	Dr Babitha Rani A.M.	Scientist	Senior Scientist	07.01.2017
4	Dr Murlidhar P. Ande	Scientist	Senior Scientist	21.04.2018

Senior Scientist & Scientist to the next Higher Grade

S. No.	Name of the Employee	Designation	w.e.f.
1	Dr Paramita Banerjee Sawant	Sr. Scientist	01.01.2017
2	Dr Mohd. Aklakur	Scientist	01.01.2018
3	Dr Sikendra Kumar	Scientist	01.01.2018
4	Dr Arun Sharma	Scientist	01.01.2018
5	Dr Kartireddy Syamala	Scientist	01.01.2018
6	Dr Thongam Ibemcha Chanu	Scientist	01.01.2018

MACP (Meeting held between April 18 to March 19)

Sl. No.	Name of the Employee	Designation	w.e.f.
1	Mr Nandu L. Ghane	Upper Division Clerk	01.01.2019
2	Mr Suresh H. Bhosale	Upper Division Clerk	25.09.2018
3	Mr Raju N. Kamble	Lower Division Clerk	28.09.2018
4	Mr Mahesh Waghela	Lower Division Clerk	30.03.2019

Promotions (Meeting held between April 18 to March 19)

Sl. No.	Name of the Employee	From	To	w.e.f.
1	Mr Ram Singh	ACTO (T-7/8)	CTO (T-9)	01.01.2018
2	Mr V. N. Acharayulu	ACTO (T-7/8)	CTO (T-9)	01.01.2018
3	Mr V. Shivaji	Technician	Sr Technician	15.06.2018
4	Mr Bharat P. Chauhan	UDC	Assistant	17.01.2019
5	Mr Nandu L. Ghane	UDC	Assistant	17.01.2019
6	Mr Ram Milan Singh	LDC	UDC	18.01.2019



हिन्दी प्रगति प्रतिवदन



भा.कृ.अनु.प.- केन्द्रीय मात्स्यिकी शिक्षा संस्थान, मुंबई का हिन्दी प्रगति प्रतिवेदन-2018-19

15.1. पुरस्कार

मुंबई स्थित भारत सरकार के केन्द्रीय कार्यालय द्वारा राजभाषा हिन्दी में सर्वाधिक कार्य करने हेतु मुंबई की सुप्रसिद्ध साहित्यिक-सामाजिक-सांस्कृतिक संस्था 'आशीर्वाद' द्वारा पुरस्कृत किया जाता है। इस वर्ष (2017-18) भा.कृ.अनु.प. - केन्द्रीय मात्स्यिकी शिक्षा संस्थान को हिन्दी में सर्वाधिक कार्य करने पर 'आशीर्वाद संस्था' द्वारा द्वितीय पुरस्कार प्रदान किया गया। यह पुरस्कार बृहस्पतिवार, दिनांक 27 सितम्बर, 2018 को डा. राजेश्वर उनियाल, उप निदेशक (राजभाषा) ने प्राप्त किया।

15.2. राष्ट्रीय वैज्ञानिक राजभाषा परिसंवाद

संस्थान में दिनांक 25-26 फरवरी, 2019 को भारतीय कृषि अनुसंधान परिषद एवं वैज्ञानिक और औद्योगिक अनुसंधान परिषद सहित अन्य वैज्ञानिक संस्थानों के राजभाषा कार्य से जुड़े वैज्ञानिकों तथा राजभाषा कर्मियों के लिए "वैज्ञानिक संस्थानों में राजभाषा कार्यान्वयन" विषय पर दो दिवसीय राष्ट्रीय वैज्ञानिक राजभाषा परिसंवाद का आयोजन किया

गया। इस परिसंवाद का उद्घाटन दिनांक 25 फरवरी, 2019 को संस्थान के निदेशक महोदय डा. गोपाल कृष्णा, कार्यक्रम के मुख्य अतिथि डा. देवेन्द्र मेवाड़ी, वैज्ञानिक एवं लेखक, डा. दंगल झाल्टे, भूतपूर्व निदेशक केन्द्रीय अनुवाद ब्यूरो, नई दिल्ली एवं डा. डी. डी. ओझा, वैज्ञानिक एवं लेखक तथा डा. राजेश्वर उनियाल, उप निदेशक (राजभाषा), के.मा.शि.सं. के करकमलों से दीप प्रज्वलित कर किया गया। सर्वप्रथम संस्थान के निदेशक / कुलपति महोदय डा. गोपाल कृष्णा ने समस्त अतिथियों एवं उपस्थित प्रतिभागियों का स्वागत किया। इस दो दिवसीय परिसंवाद में भा.कृ.अनु.परिषद के विभिन्न संस्थानों के कुल 50 प्रतिभागियों ने भाग लिया एवं कुल 9 प्रतिभागियों ने वैज्ञानिक संस्थानों में राजभाषा विषय पर अपना लेख प्रस्तुत किया। इस परिसंवाद के अंतर्गत संस्थान की गृहपत्रिका जलचरी के अंक - 23 हेतु भारतीय मात्स्यिकी के विभिन्न पहलू विषय पर आधारित एक प्रतियोगिता के सर्वश्रेष्ठ 6 लेखों के लेखकों को पुरस्कृत किया गया। इसी के साथ समस्त प्रतिभागियों को स्मृति चिन्ह एवं प्रमाण पत्र प्रदान किया।



15.3. हिन्दी संगोष्ठी

यह संस्थान प्रतिवर्ष एक हिन्दी संगोष्ठी आयोजन करता है। इस वर्ष संस्थान के काकिनाड़ा केन्द्र में दिनांक 15-16 मार्च, 2019 को "भारत के दक्षिणी राज्यों की मात्स्यिकी संवर्धन के नए आयाम" विषय पर हिन्दी में एक संगोष्ठी का आयोजन किया गया। इस संगोष्ठी की अध्यक्षता डा. गोपी कृष्णा, भूतपूर्व विभागाध्यक्ष, केन्द्रीय खारा पानी जलकृषि अनुसंधान संस्थान ने निभाई। डा. एस. एन. ओझा, विभागाध्यक्ष, के.मा.शि.सं. उपाध्यक्ष थे। इस संगोष्ठी के मुख्य अतिथि डा. गोपाल कृष्णा, निदेशक/कुलपति, के.मा.शि.सं. का स्वागत के. मा. शि. सं. - काकिनाड़ा केन्द्र के प्रभारी डा. मुरलीधर अण्डे ने शाल एवं पुष्पगुच्छ प्रदान कर किया। कुल नौ प्रतिभागियों ने अपने लेखों का पावरपॉइंट के माध्यम से प्रस्तुतिकरण किया। डा. सुनील कुमार नायक, प्रभारी, के. मा. शि. सं. - पवारखेड़ा केन्द्र ने प्रतिवेदक की भूमिका निभाई। इस संगोष्ठी में लगभग 50 प्रतिभागी उपस्थित थे। संगोष्ठी का मंच संचालन श्री देवेन्द्र धरम, सहायक निदेशक (राजभाषा) ने किया।



15.4. हिन्दी पखवाड़ा

संस्थान में प्रतिवर्ष की भांति इस वर्ष भी दिनांक 14 से 28 सितम्बर, 2018 तक हिन्दी पखवाड़ा 2018 मनाया गया। इस समारोह का उद्घाटन दिनांक 14 सितम्बर, 2018 को संस्थान के सभागृह में मुख्य अतिथि डा. आर. आर. उपाध्याय, प्रख्यात हृदयरोग विशेषज्ञ एवं रामचरितमानस व भागवत गीता के श्रेष्ठ वक्ता के साथ ही संस्थान के निदेशक/कुलपति डा. गोपाल कृष्णा जी, डा. एन.पी. साहू, विभागाध्यक्ष, डा. राजेश्वर उनियाल, उप निदेशक (राजभाषा), श्री महेश खुबडीकर, वरिष्ठ प्रशासनिक अधिकारी के करकमलों से दीप प्रज्वलित कर किया गया। तत्पश्चात संस्थान के छात्र-छात्राओं हेतु भाषण एवं गीत प्रतियोगिता आयोजित की गई। हिन्दी पखवाड़ा 2018 के दौरान संस्थान के अधिकारियों, कर्मचारियों व छात्र-छात्राओं के साथ ही संस्थान परिवार व संस्थान परिवार के बच्चों हेतु भाषण, गीत, कविता (स्वरचित), निबंध लेखन, चित्रकला प्रतियोगिता के साथ ही अंग्रेजी में वैज्ञानिक एवं तकनीकी शब्द खोज प्रतियोगिता तथा संस्थान के समस्त अधिकारियों, कर्मचारियों व डी टी पी आपरेटरों हेतु "यूनिफोर्ड कार्यशाला" आयोजित की गई। हिन्दी पखवाड़ा 2018 का मुख्य आकर्षण दिनांक 25 सितम्बर, 2018 को आयोजित महिला दिवस के अंतर्गत मुंबई की सुप्रसिद्ध साहित्यिक सांस्कृतिक दल 'दि गैंग सिस्टर्स' द्वारा प्रस्तुत काव्य पाठ रहा। दिनांक 28 सितम्बर 2018 को हिन्दी पखवाड़ा 2018 का समापन समारोह आयोजित किया गया। इस कार्यक्रम के मुख्य अतिथि अभियान संस्थान के संस्थापक व अध्यक्ष माननीय श्री अमरजीत मिश्रा थे। कार्यक्रम की अध्यक्षता डा. गोपाल कृष्णा, निदेशक/कुलपति ने की। इस अवसर पर हिन्दी पखवाड़ा 2018 के दौरान आयोजित विभिन्न प्रतियोगिताओं के विजयी प्रतिभागियों के साथ ही वर्ष 2017-18 के दौरान मूलरूप से हिन्दी में कार्य करने वाले, टाइपिंग करने वाले अधिकारियों, कर्मचारियों

को नगद पुरस्कार (प्रोत्साहन भत्ता) एवं प्रमाणपत्र प्रदान किए गए। इस वर्ष हिन्दी पखवाड़ा 2018 का समापन माननीय अटल बिहारी वाजपेयी एवं गोपाल दास नीरज की स्मृति में काव्य संध्या का आयोजन कर किया गया। इस अवसर पर आमंत्रित कविगण श्री अभिजीत घोषाल, श्री विजय चौधरी, सुश्री ज्योति त्रिपाठी, डा. अन्नपूर्णा सिसोदिया, श्री सुभाष चंद एवं डा. पारोमिता बॅनर्जी सावंत एवं डा. राजेश्वर उनियाल ने दोनों महान कवियों की रचनाओं का पाठ करते हुए उनके साथ बिताए हुए क्षणों को उजागर किया तथा सभागृह में उपस्थित श्रोताओं को मंत्रमुग्ध किया। इसी दौरान संस्थान के समस्त उपकेन्द्रों में हिन्दी सप्ताह / पखवाड़ा 2018 का आयोजन किया गया तथा समस्त कार्य नियमित रूप से हिन्दी में किए जा रहे हैं।

15.5. राजभाषा निरीक्षण

कृषि अनुसंधान एवं शिक्षा विभाग (डेयर), नई दिल्ली के श्री ए.आर. सेनगुप्ता, उप सचिव एवं डा. पूरन सिंह, सहायक निदेशक (राजभाषा) द्वारा दिनांक 18 फरवरी, 2019 को के.मा.शि. संस्थान में राजभाषा हिन्दी से जुड़े कार्यों का निरीक्षण किया गया। सर्वप्रथम डेयर के दोनों अधिकारियों ने संस्थान के निदेशक डा. गोपाल कृष्णा से भेंट की तत्पश्चात संस्थान के राजभाषा हिन्दी से संबंधित कार्यों का निरीक्षण किया। इसके साथ ही संस्थान के प्रशासन अनुभाग एवं विभिन्न प्रयोगशालाओं का निरीक्षण भी किया। डेयर के अधिकारियों द्वारा प्राप्त निरीक्षण प्रश्नावली भरकर उन्हें उपलब्ध करा दी गई।

15.6. कार्यशाला

संस्थान में सोमवार दिनांक 29 अक्टूबर, 2018 को संस्थान के अधिकारियों / कर्मचारियों हेतु सरकारी कार्यालयों में राजभाषा कार्यान्वयन एवं हिन्दी की उपयोगिता विषय पर एक दिवसीय विशेष कार्यशाला का आयोजन किया गया। इस कार्यशाला में संस्थान के अधिकारियों / कर्मचारियों के साथ ही

मुंबई विश्वविद्यालय के के.सी. कॉलेज, विल्सन कॉलेज एवं महर्षि दयानंद कॉलेज के हिन्दी के विद्यार्थी भी उपस्थित थे। इस कार्यशाला में कुल 38 प्रतिभागियों ने भाग लिया।

15.7. यूनिकोड कार्यशाला

संस्थान के समस्त अधिकारियों, कर्मचारियों एवं डी टी पी आपरेटरों को कम्प्यूटर पर हिन्दी में काम करना आसान हो इसलिए बुधवार, दिनांक 26 सितम्बर, 2018 को एक दिवसीय "यूनिकोड कार्यशाला" संचालित की गई। यह कार्यशाला दो सत्रों में संचालित की गई थी जिनमें श्री कलीम उल्लाह खान, कम्प्यूटर विशेषज्ञ ने कम्प्यूटर पर हिन्दी में काम करते हुए आनेवाली समस्याओं से अवगत कराते हुए कम्प्यूटर पर यूनिकोड डाउनलोड करने का व्यवहारिक ज्ञान भी प्रदान किया। इस कार्यशाला में कुल 34 अधिकारियों/कर्मचारियों तथा डी टी पी आपरेटरों ने सक्रिय भाग लिया। कार्यशाला का समन्वयन श्रीमती रेखा नायर, सहायक मुख्य तकनीकी अधिकारी ने किया। सभी प्रतिभागियों के लिए यह कार्यशाला लाभप्रद रही।

15.8. बैठक

संस्थान की राजभाषा कार्यान्वयन समिति की 89 वीं, 90 वीं तथा 91 वीं तिमाही बैठक क्रमशः दिनांक 22 मई, 2018, 7 अगस्त, 2018 व 5 दिसम्बर, 2018 को संस्थान के निदेशक महोदय, डा. गोपाल कृष्णा की अध्यक्षता में सम्पन्न हुई। बैठक में लिए गए निर्णयों पर अनुवर्ती कार्रवाई की जा रही है।

नगर राजभाषा कार्यान्वयन समिति, उत्तर मुंबई (कार्यालय) की दिनांक 27 नवम्बर, 2018 को विकास आयुक्त का कार्यालय में आयोजित बैठक में संस्थान के निदेशक महोदय डा. गोपाल कृष्णा एवं श्री देवेन्द्र कुमार धरम, सहायक निदेशक (राजभाषा) ने भाग लिया।

15.9. शैक्षणिक

हिन्दी जलवाणी पाठ्यक्रम - संस्थान के स्नातकोत्तर (एम. एफ. एस.सी.) के सत्र 2018-20 के प्रथम वर्ष के छात्र-छात्राओं हेतु हिन्दी जलवाणी एक क्रेडिट कोर्स की कक्षाएं नियमित रूप से संचालित कर 21 फरवरी, 2019 को हिन्दी जलवाणी की अंतिम परीक्षा संचालित की गई एवं उत्तर पत्रिकाओं का मूल्यांकन कर संस्तुति प्रस्तुत की। इसी के साथ संशोधित हिन्दी जलवाणी पाठ्यक्रम का मुद्रण कार्य किया जा रहा है।

संस्थान के पी.एच.डी. एवं एम.एफ.एस.सी. के छात्र-छात्राओं के शोध निबंधों का सारांश हिन्दी में अनुवाद कर प्रस्तुत किया।

15.10. प्रकाशन

संस्थान में आयोजित राष्ट्रीय वैज्ञानिक राजभाषा परिसंवाद के उद्घाटन समारोह में संस्थान के निदेशक महोदय, डा. गोपाल कृष्णा, मुख्य अतिथि डा. देवेन्द्र मेवाड़ी, वैज्ञानिक एवं लेखक के साथ ही डा. दंगल झाल्टे, भूतपूर्व निदेशक केन्द्रीय अनुवाद ब्यूरो, नई दिल्ली व डा. डी. डी. ओझा, वैज्ञानिक एवं लेखक के करकमलों से निम्नलिखित दो प्रकाशनों का विमोचन किया गया -

1. गृहपत्रिका - जलचरी अंक 23

2. मात्स्यिकी शब्दकोश

- संस्थान के काकिनाड़ा केन्द्र में आयोजित हिन्दी संगोष्ठी हेतु

1. मागुर का आहार एवं पोषण

2. मागुर जलकृषि

3. ब्रुड भंडारण विकास एवं मागुर प्रजनन बुलेटिनों का हिन्दी अनुवाद कर प्रस्तुत किया।

- काकिनाड़ा में सम्पन्न हिन्दी संगोष्ठी हेतु विभिन्न वैज्ञानिकों के लेखों का हिन्दी अनुवाद कर प्रस्तुत किया।

- संस्थान के प्रधान वैज्ञानिक, डा. कृष्णानी द्वारा प्राप्त 1. किसानों की आमदनी को दोगुना करने के लिए समन्वित आधारित जलकृषि में परिसंचरण आर्थिकी का प्रयोग 2. किसानों की आजीविका बढ़ाने के लिए जलाशयों में पालन आधारित मात्स्यिकी का हिन्दी अनुवाद एवं 3. मत्स्य उत्पादकांकडून कोळंबी (श्रिम्प) च्या जलकृषी तंत्रज्ञान जैव उत्पादनांसाठी ग्रीन वॉटर टेक्नोलॉजी चा स्वीकार - का मराठी अनुवाद।
- इसी के साथ गॅरिअल मागुर का संवर्धन एवं उनका प्रबंधन - डा. अरुण शर्मा
- दक्षिण भारत में कैटफिश पालन - डा. महापाला के साथ ही संस्थान के विभिन्न वैज्ञानिकों द्वारा प्राप्त लेखों, प्रपत्रकों आदि का हिन्दी / मराठी में अनुवाद कार्य कर प्रस्तुत किया गया।

15.11. अन्य

भा.कृ.अनु.प. - केन्द्रीय मात्स्यिकी शिक्षा संस्थान, मुंबई में दिनांक 16 से 18 मई, 2018 तक एशियन फिशरीज सोसायटी, मलेशिया एवं इंडियन फिशरीज एसोसिएशन, मुंबई के संयुक्त तत्वावधान में जलकृषि एवं मात्स्यिकी शिक्षा (IASFE 3) विषय पर आयोजित तीन दिवसीय तृतीय अंतरराष्ट्रीय संगोष्ठी का विस्तृत प्रतिवेदन और संस्तुति हिन्दी में प्रस्तुत की।

भा. कृ. अनु. प.-केन्द्रीय शिक्षा संस्थान का 57 वां वार्षिक दिवस समारोह दिनांक 6 जून, 2018 को हार्पोल्लास के साथ मनाया गया। इस अवसर पर समारोह के मुख्य अतिथि, श्री प्रकाश मेहता जी, माननीय गृहनिर्माण, श्रम एवं खनन मंत्री, महाराष्ट्र सरकार, के करकमलों से संस्थान में वर्ष 2017-18 के दौरान आयोजित विभिन्न प्रतियोगिताओं के विजयी प्रतिभागियों / उक्त वर्ष के दौरान हिन्दी माध्यम से प्रस्तुत व्याख्यानों के वक्ताओं / हिन्दी जलचरी अंक 23 हेतु प्राप्त मूल्यांकित उत्कृष्ट लेखों के लेखकों तथा वर्ष 2016-17 में मूल रूप से हिन्दी में

काम करने पर / टाइपिंग कार्य करने पर संबंधित अधिकारियों/कर्मचारियों को प्रोत्साहन भत्ता एवं नगद पुरस्कार प्रदान किए गए।

संस्थान में दिनांक 16 से 31 दिसम्बर, 2018 तक इस वर्ष का तीसरा स्वच्छता पखवाड़ा मनाया गया जिसमें हिन्दी माध्यम से विभिन्न प्रतियोगिताएं आयोजित की गईं।

संस्थान में दिनांक 29 अक्टूबर, 2018 से 31 नवम्बर, 2018 तक सर्तकता सप्ताह मनाया गया, इसमें हिन्दी माध्यम से विभिन्न प्रतियोगिताएं संचालित की गईं।