# 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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# 01 Preface

# 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 7$^{th}$ 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.

Apart 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)**

Director/Vice-Chancellor

# 02 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 enterc 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 Agricutural 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 headquartes 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 सुदृढ 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 जरुरतों के साथ सम्मिलित किया जाता है। हाल की कुछ शोध उपलब्धियों में जल निस्पंदन और उपचार प्रणाली का विकास, ए. टार्डा और फ्लेवोबैक्टीरियम कॉलुम्नर 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 गरीपस का आनुवंशिक विकास, शून्य जल विनिमय कार्प हैचरी और एक्वापोनिक्स 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 रिव्यूड्ड साइन्टिफिक 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 गई । 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।


विद्युत गृह
ELECTRIC ROOM

# 03 Introduction

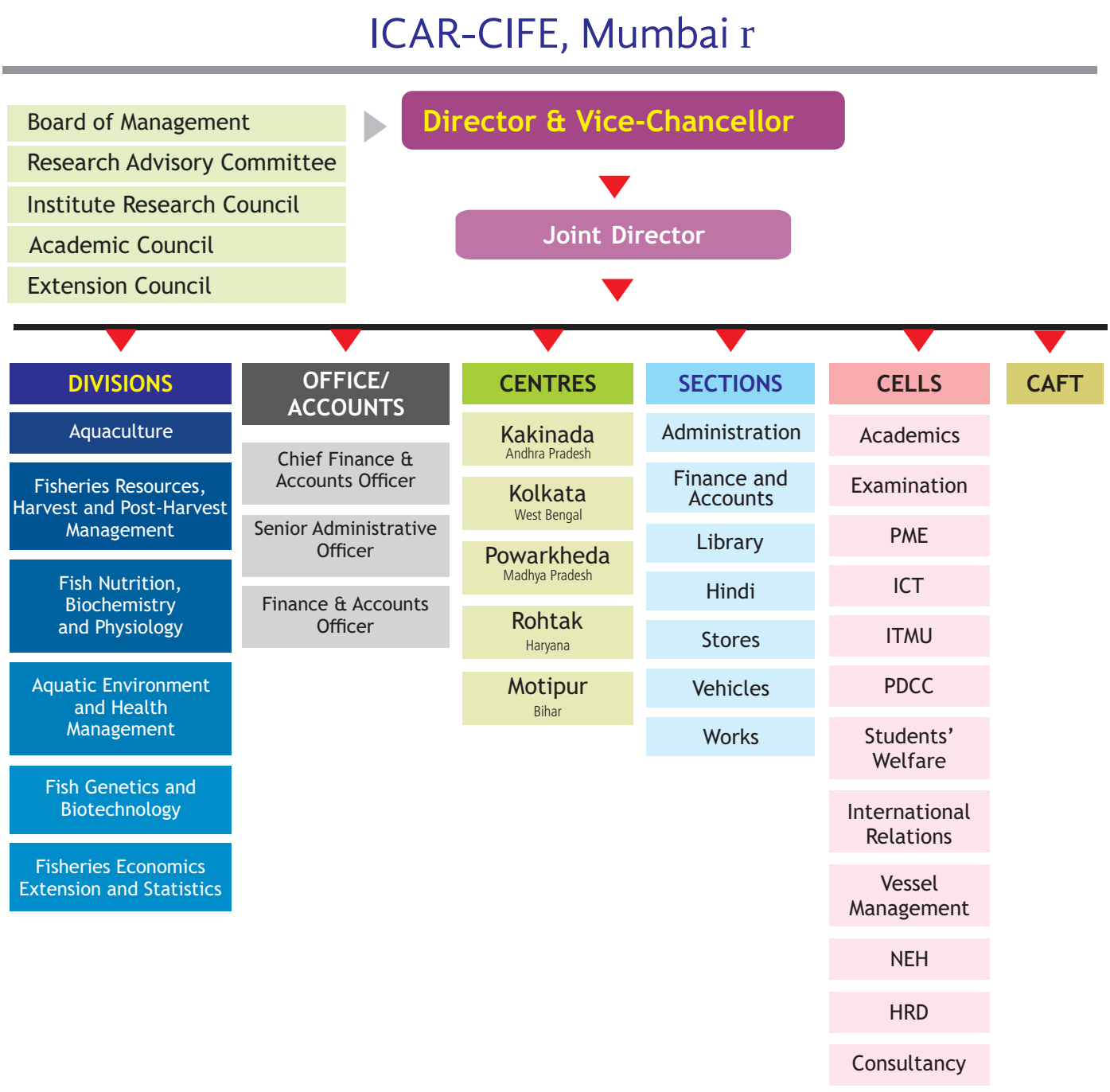
## 3.1. Introduction

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



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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*

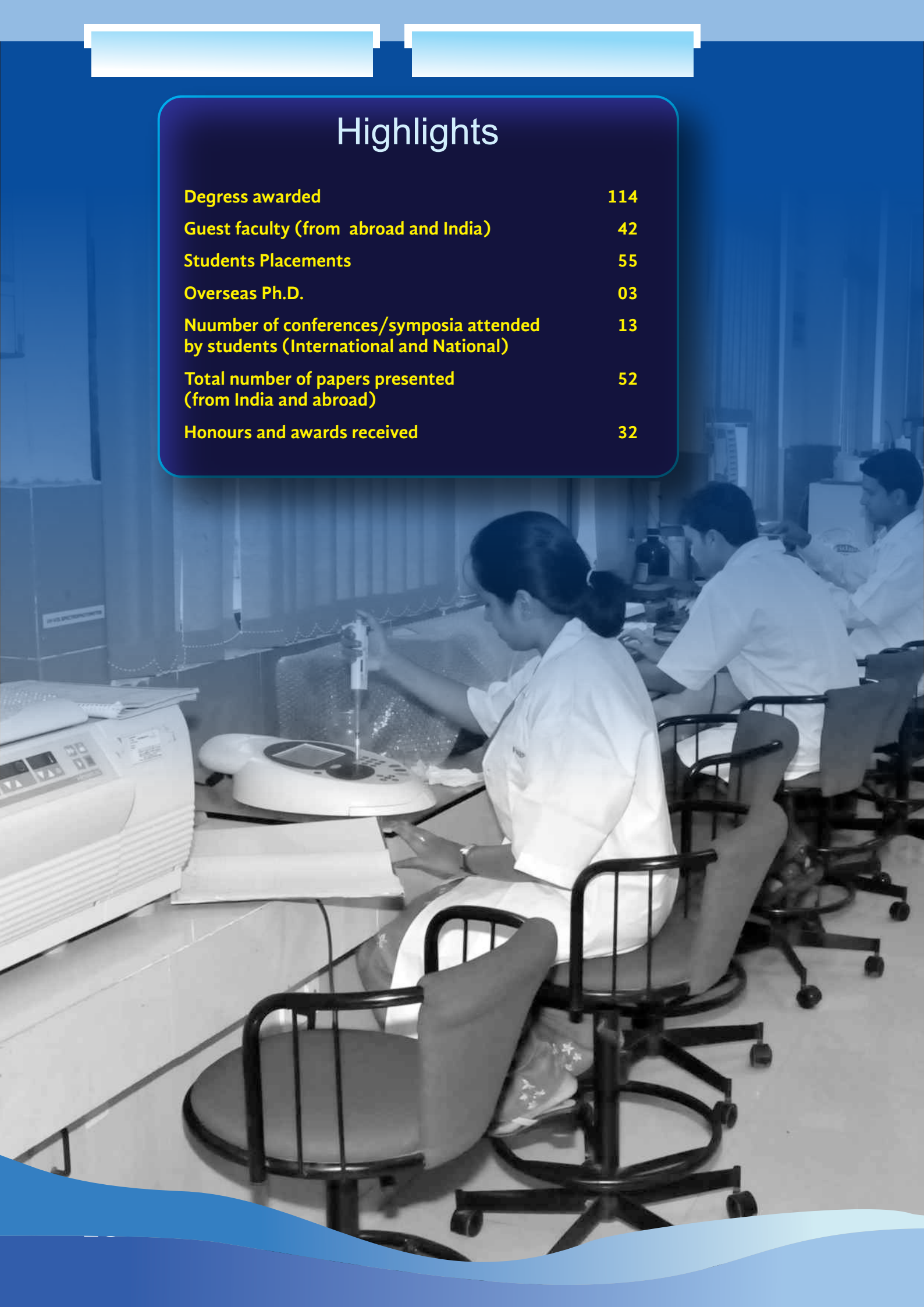
| S. No. | Head | Sanctioned/ Balance C/f | Received | Expenditure Incurred |
|---|---|---|---|---|
| 1. | Institute Expenditure | 8,774.53 | 8,784.60 | 8,704.42 r |
| 2. | CAFT | 21.02 | - | 6.85 r |
| 3. | SDU | 147.76 | 116.35 | 82.99 r |
| 4. | Library strengthening (SDAE) | 63.47 | 11.53 | 59.50 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

# 04 Academic Achievements

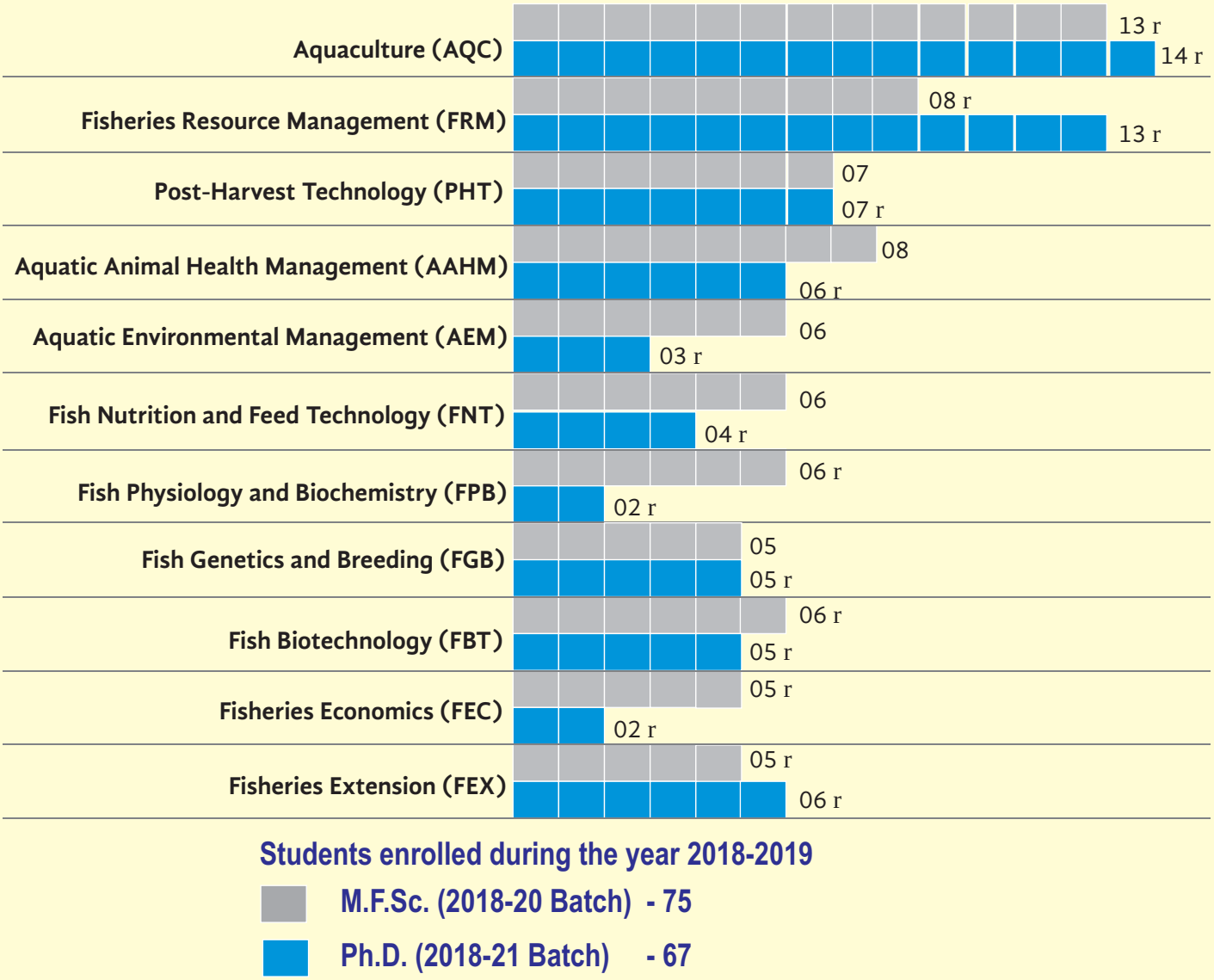
# Highlights

| | |
|---|---|
| Degress awarded | 114 |
| Guest faculty (from abroad and India) | 42 |
| Students Placements | 55 |
| Overseas Ph.D. | 03 |
| Nuumber 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

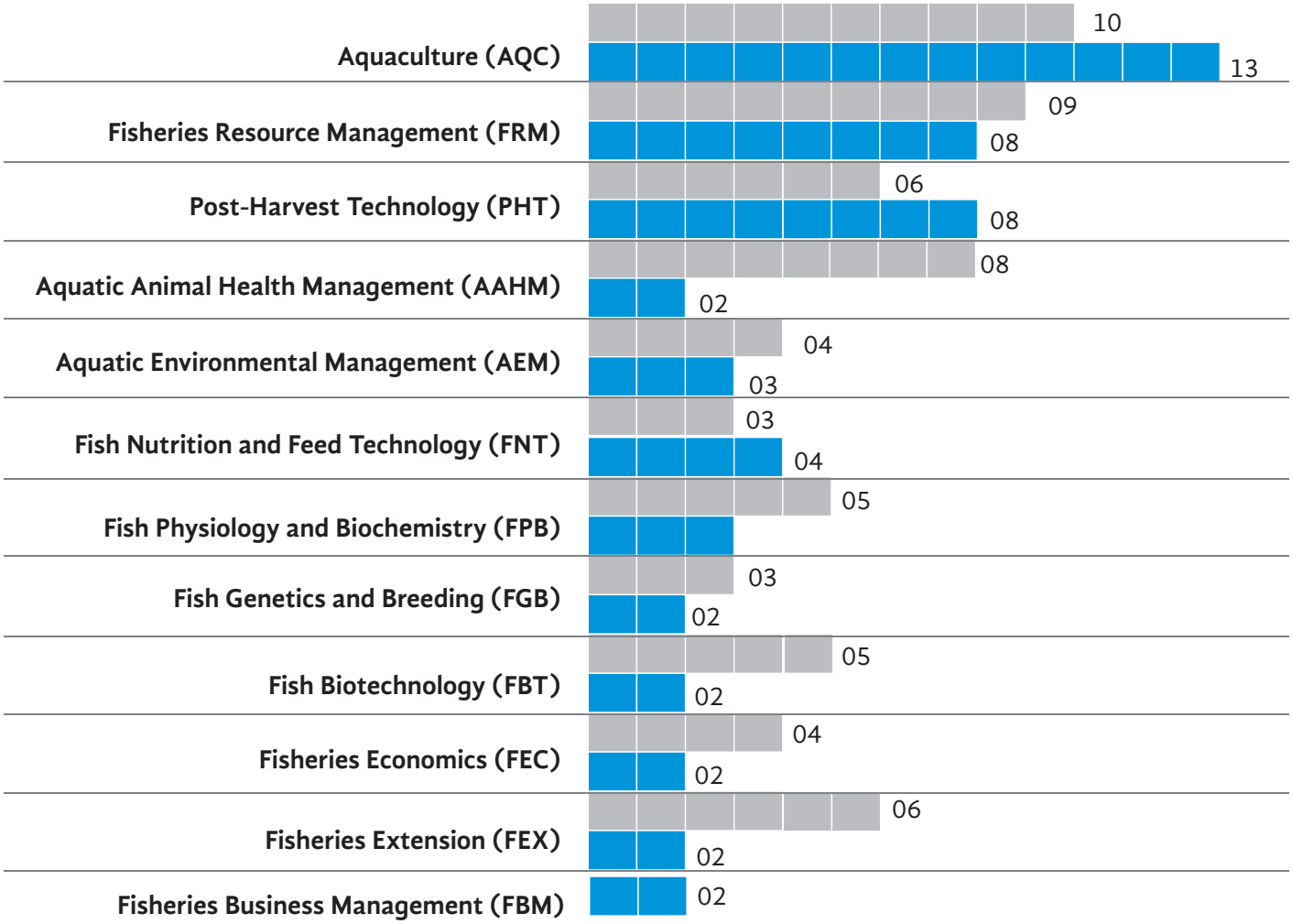
A total of 67 students have enrolled for the doctoral programme and 75 students have enrolled for the master programme which includes one foreign student from Tanzania.




## 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 *Clarias magur* (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 *Bacillus* 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, *Astronotus ocellatus* 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 *Pangasianodon hypophthalmus* (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, *Labeo rohita* (Hamilton, 1822) fingerlings r |
| 9. | Mr. Gavin Raplang Nongsiej AQC-MA6-12 | Dr. V. K. Tiwari | Study on growth and survival of *Cyprinus carpio* 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 *Cyprinus carpio* (Linnaeus, 1758) r |
| **2. Fisheries Resources Management** | | | |
| 11. | Mr. Abhijit Mallik FRM-MA6-01 | Dr. Shashi Bhushan | Stock structure analysis of *Priacanthus hamrur* (Forsskal, 1775) from Indian waters r |
| 12. | Ms. Chellamanimegalai P. FRM-MA6-02 r | Dr. G. Deshmukhe | Taxonomical study of genus *Grateloupia 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 *Thryssa* 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<br>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<br>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<br>FRM-MA6-09 | Dr. G. Deshmukhe | Study on growth and biochemical composition of *Ulva* species from thermally polluted and non-polluted sites along west coast of India r |

## Post-Harvest Technology

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

## Aquatic Animal Health Management

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

## Aquatic Environmental Management

| | | | |
|---|---|---|---|
| 34. | Mr. Tapas Paul<br>AEM-MA6-01 | Dr. Saurav Kumar | Effect of temperature and pH on triclosan toxicity in *Pangasianodon hypophthalmus* r |
| 35. | Mr. Sutanu Karmakar<br>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<br>AEM-MA6-03 | Dr. Vidya Shree Bharti | Effects of Biochar on aquatic primary productivity and pond sediment r |
| 37. | Mr. Manickavasagam S.<br>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<br>FNT-MA6-01 | Dr. N. P. Sahu | Utilisation of *Hygrophila spinosa* leaf meal in the diet of *Labeo rohita* (Hamilton, 1822) r |
| 39. | Ms. Sraddhanjali Sahoo<br>FNT-MA6-02 | Dr. K. K. Jain | Alternate feeding strategies to enhance the utilization of leaf meal-based diet in *Labeo rohita* (Hamilton, 1822) fingerling r |
| 40. | Ms. Deepjyoti Bora<br>FNT-MA6-03 | Dr. Ashutosh D. Deo | Evaluation of mixed leaf meal in the diet of *Labeo rohita* (Hamilton, 1822) fingerling r |

## Fish Physiology and Biochemistry

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

## Fish Genetics and Breeding

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

## Fish Biotechnology

| | | | |
|---|---|---|---|
| 49. | Mr. Manabesh Mahapatra<br>FBT-MA6-02 | Dr. Aparna Chaudhari | *In silico* mining of *Clarias magur* (Hamilton, 1822) transcriptome data for novel proteins and applications r |

| | | | |
|---|---|---|---|
| 50. | Ms. Safna P.<br>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. Sathiyanarayanan A.<br>FBT-MA6-04 | Dr. Mukunda Goswami | Establishment of cell culture system from *Pangasius hypophthalmus* (Sauvage, 1878) r |
| 52. | Ms. Hemamalini N.<br>FBT-MA6-05 | Dr. Aparna Chaudhari | Full-Length cDNA characterization and expression profiling of kisspeptin and its receptor in *Clarias magur* r |
| 53. | Ms. Sonal Suman<br>FBT-MA6-06 | Dr. A. Pavan Kumar | Development of markers for identification of the hybrid of *Clarias magur* (Hamilton, 1822) r |
| **Fisheries Economics** | | | |
| 54. | Ms. Jyotimanjari Sahoo<br>FEC-MA6-01 | Dr. Ananthan P. S. | Human resource accounting of ICAR-CIFE's higher education r |
| 55. | Mr. Mohammed Meharoof<br>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.<br>FEC-MA6-03 | Dr. Rama Sharma | Comparative economics of conventional and semi-organic *Litopenaeus vannamei* (Boone, 1931) farming practices in Andhra Pradesh r |
| 57. | Ms. Tenji Pem Bhutia<br>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<br>FEX-MA6-01 | Dr. S. N. Ojha | Climate resilience of fishers in Chilika lake region r |
| 59. | Ms. Dhenuvakonda Kiranmayi<br>FEX-MA6-02 | Dr. Arpita Sharma | Design of Mobile App prototype for fish farmers of Telangana r |
| 60. | Ms. Meher Siddhika Vilas<br>FEX-MA6-03 | Dr. Ananthan P. S. | Designing a Mobile App prototype for online seafood sale and purchase r |
| 61. | Mr. Subhash Kumar Banjare<br>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<br>FEX-MA6-05 | Dr. S. N. Ojha | Exploring aquaculture entrepreneurship development process for students in Nagaland r |
| 63. | Mr. Rajeshwaran M.<br>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<br>Regn. No.<br>Batch | Topic of the thesis | Major Advisor | Date of Viva-voce |
|---|---|---|---|---|
| 1. | Ms. H. Mandakini Devi<br>PHT-PA1-05<br>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.<br>PHT-PA3-07<br>2013-16 | Development of effective curing methods for preservation of *Pangasius hypophthalmus* (Sauvage, 1878) r | Dr. Amjad K. Balange | 7 April, 2018 r |
| 3. | Mr. Abhishek Thakur<br>PHT-PA2-05<br>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<br>FPB-PA1-02<br>2011-14 | Cellular and molecular responses of metabolic modifiers in *Cirrhinus mrigala* (Hamilton, 1822) exposed to hypoxia r | Dr. A. K. Pal | 16 April, 2018 r |
| 5. | Mr. Gajanan S. Ghode<br>AAH-PA1-05<br>2011-14 | Molecular characterization of Toll-like Receptor (TLR-4) and expression analysis of selected downstream molecules of *Pangasianodon hypophthalmus* after exposure to *Edwardsiella tarda* r | Dr. G. Rathore | 18 April, 2018 r |
| 6. | Mr. R. Srinu<br>PHT-PA3-05<br>2013-16 | Prevalence diversity and pathogenic potentials of *Acrobacter* spp. in sea foods r | Dr. B. B. Nayak | 19 April, 2018 r |
| 7. | Mr. Irfan Ahmad Bhat<br>FGB-PA4-01<br>2014-17 | Development and characterization of chitosan nanoparticles loaded with eurycomanone for enhancing reproductive output in *Clarias magur* r (Hamilton, 1822) r | Dr. Rupam Sharma | 21 April, 2018 r |
| 8. | Ms. Nimmy Jousy<br>FBT-PA2-03<br>2012-15 | Marker based pedigree identification and genetic parameter estimation in captive bred *Clarias batrachus* r (Linnaeus, 1758) | Dr. Shrinivas Jahageerdar r | 23 April, 2018 r |
| 9. | Mr. Anuraj A.<br>AQC-PA1-03<br>2011-14 | Micropropagation of selected seaweeds in Andaman & Nicobar Islands r | Dr. Chandra Prakash | 21 May, 2018 r |
| 10. | Mr. Suhas M. Wasave<br>FEX-PA2-03<br>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<br>FRM-PA1-03<br>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.<br>PHT-PA1-02<br>2011-14 | Prevalence and molecular characterization of the pandemic clones of *Vibrio parahaemolyticus* r in seafood | Dr. Sanath Kumar H. | 6 August, 2018 r |

| | | | | |
|---|---|---|---|---|
| 13. | Mr. Katare Milind Bhagwan<br>AQC-PA3-11<br>2013-16 | Masculinization in dwarf gourami, *Trichogaster lalius* (Hamilton, 1822) through aromatase inhibitors | Dr. W. S. Lakra | 25 August, 2018 |
| 14. | Mr. Irshad Ahmad Hajam<br>AQC-PA4-02<br>2014-17 | Development and evaluation of anti-inhibin antibody on oocyte maturation in *Clarias batrachus* (Linnaeus, 1758) | Dr. Neelam Saharan | 28 August, 2018 |
| 15. | Ms. Rashmi S. Ambulkar<br>AQC-PA3-13<br>2013-16 | Comparative evaluation of fresh and cryopreserved milt for quality seed production of *Clarias batrachus* (Linnaeus, 1758) | Dr. C. S. Chaturvedi | 6 September, 2018 |
| 16. | Ms. Anusha D.L. Wickramasinghe<br>AEM-PA4-04<br>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.<br>FGB-PA1-01<br>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<br>AQC-PA5-16<br>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<br>FEX-PA4-04<br>2014-17 | Gender analysis of ornamental fish enterprises in Maharashtra | Dr. Arpita Sharma | 6 October, 2018 |
| 20. | Ms. Jasmin F.<br>FRM-PA2-06<br>2012-15 | Fishery, distribution, biology and a exploitation status of *Sepia aculeata* Van Hasselt, 1835 off Andhra Coast | Dr. Latha Shenoy | 6 October, 2018 |
| 21. | Ms. Prathvi Rani<br>FBM-PA1-03<br>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.<br>FNT-PA2-02<br>2012-15 | Expression of stress linked enzymatic antioxidants in *Labeo rohita* and its modulation through nutraceuticals | Dr. N. P. Sahu | 14 November, 2018 |
| 23. | Mr. Rajesh M.<br>FPB-PA2-01<br>2012-15 | Nutritional regulation of muscle growth related genes in *Schizothorax richardsonii* (Gray, 1832) | Dr. A. K. Singh | 22 November, 2018 |
| 24. | Mr. Mir Ishfaq Nazir<br>FNT-PA5-02<br>2015-18 | Studies of selected digestive enzymes during ontogenic development and their responses to diet in *Clarias magur* (Linnaeus, 1758) juveniles | Dr. K. K. Jain | 24 November, 2018 |
| 25. | Ms. Chirom Archana<br>AQC-PA3-01<br>2013-16 | Combating the toxicity of pendimethalin in *Cyprinus carpio* fingerlings through bioremediation and dietary manipulation | Dr. Neelam Saharan | 24 November, 2018 |
| 26. | Ms. Manjusha L.<br>PHT-PA2-01<br>2012-15 | Human enteric viruses in seafood and the coastal environment | Dr. B. B. Nayak | 26 November, 2018 |

| | | | | |
|---|---|---|---|---|
| 27. | Mr. Showkat Ahmad Dar<br>FPB-PA5-01<br>2015-18 | Studies on regulation and expression of Ghrelin Gene in *Labeo rohita* (Hamilton, 1822) under different feeding regimes r | Dr. P. P. Srivastava | 26 November, 2018 r |
| 28. | Mr. Sarvendra Kumar<br>FNT-PA4-01<br>2014-17 | Optimizing the utilization of De-oiled rice bran in the diet of *Labeo rohita* (Hamilton, 1882) based on metabolic and molecular responses r | Dr. N. P. Sahu | 27 November, 2018 r |
| 29. | Mr. Elzein M.H. Fahal<br>AQC-PA4-14<br>2014-17 | Effects of *Moringa oleifera* extracts on growth, maturation and reproductive performance of Asian catfish *Clarias batrachus* r (Linnaeus, 1758) r | Dr. Neelam Saharan | 28 November, 2018 r |
| 30. | Ms. Thankam T. Paul<br>FRM-PA3-07<br>2013-16 | Icthyo-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<br>AQC-PA2-07<br>2012-15 | Study of ontogeny of digestive system and evaluation of weaning strategies in Asian stinging catfish, *Heteropneustes fossilis* (Bloch, 1794) during larval development r | Dr. P. K. Pradhan | 29 November, 2018 r |
| 32. | Mr. Naorem Dinesh Singh<br>FEC-PA5-03<br>2015-18 | Propagative casual price transmission in Indian Shrimp export markets r | Dr. M. Krishnan | 3 December, 2018 r |
| 33. | Mr. Subal Kumar Roul<br>FRM-PA2-01<br>2012-15 | Taxonomic revision of family belonidae, and biology and stock assessment of *Ablenneshians* r (Valenciennes, 1846) along Kerala Coast r | Dr. A. K. Jaiswar | 3 December, 2018 r |
| 34. | Mr. Renjith R.K.<br>FRM-PA2-02<br>2012-15 r | Species differentiation of family Teraponidae along Indian Coast r | Dr. A. K. Jaiswar | 4 December, 2018 r |
| 35. | Mr. Raju Baitha<br>AAH-PA2-01<br>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<br>FBT-PA4-02<br>2014-17 | Transcriptome analysis of brain and gonads at different maturity stages of *Clarias magur* r (Hamilton, 1822) r | Dr. Gireesh Babu P. | 5 December, 2018 r |
| 37. | Ms. E.M. Chhandaprajna Darsini FRM-PA2-05<br>2012-15 | Biology and stock assessment of *Sourida undosquamis* (Richardson, 1848) along Mumbai Coast r | Dr. S. K. Chakraborty | 6 December, 2018 r |
| 38. | Mr. Kharatmol Balaji Rudrappa<br>FRM-PA5-08<br>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<br>AQC-PA5-15<br>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<br>AQC-PA2-03<br>2012-15 | Abundance of clown fishes and reproductive performance of skunk clownfish, *Amphiprion akallopisos* r (Bleeker, 1853) from Andaman Sea | Dr. A. K. Verma | 15 January, 2019 r |

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|---|---|---|---|---|
| 41. | Ms. Shilta M.T.<br>AQC-PA2-05<br>2012-15 | Studies on the biology of picnic seabream *Acanthopagrus berda* r (Forsskal, 1775) from Calicut, South-West coast of India r | Dr. N. K. Chadha | 15 January, 2019 r |
| 42. | Mr. Vivek Shrivastava<br>AQC-PA1-12<br>2011-14 | Effect of stocking densities and partial replacement of dietary animal protein and lipid with soybean on growth and survival r of *Fenneropenaeus merguiensis* r (de Man, 1888) r | Dr. N. K. Chadha | 16 January, 2019 r |
| 43. | Mr. Ratheesh Kumar R.<br>AEM-PA2-01<br>2012-15 | Spatio-temporal variations in stationary bag net fishery of Maharashtra coast with reference r to environmental factors r | Dr. A. P. Dineshbabu | 17 January, 2019 r |
| 44. | Mr. Raju M. Timbile<br>AQC-PA2-11<br>2012-15 | Studies on growth, survival and reproduction of discus, *Symphysodona equifasciatus* Pellegrin, 1904 r | Dr. Paramita B. Sawant | 18 January, 2019 r |
| 45. | Ms. Piyashi Deb Roy<br>FBM-PA1-02<br>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<br>FRM-PA2-03<br>2012-15 | Biology and stock delineation of the razor moonfish, *Mene maculata* 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<br>PHT-PA5-06<br>2015-18 r | Effect of different washing methods and natural additives on the quality and stability of Tilapia surmi r | Dr. A. K. Balange | 24 January, 2019 r |
| 48. | Mr. Nagung Camder Tok<br>FNFT-PA1-01<br>2011-14 | Growth and immunomodulatory responses of *Labeo rohita* r (Ham, 1822) to dietary *Houttuynia cordata* Extract r | Dr. K. K. Jain | 31 January, 2019 r |
| 49. | Mr. Devananda Uchoi<br>PHT-PA2-02<br>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.<br>AEM-PA1-02<br>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<br>FEC-PA3-01<br>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<br>6 August, 2018<br>8 October, 2018<br>22 December, 2018<br>2 February, 2019 |
| Dr. Annam Pavan Kumar | Application of genomics in fisheries and aquaculture | Sathyabama Institute of Science and Technolog, Chennai, Tamil Nadu | 21 June, 2018 |
| Dr. Sunil Kumar Nayak | *Matsya Palan Taknik ki Jankari* | Agriculture Training Centre, Powarkheda, Hoshangabad, MP | 1 June, 2018<br>22 June, 2018<br>29 June, 2018<br>9 October, 2018<br>21 December, 2018<br>22 February, 2019<br>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 | 2nd 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 (*L. vannamei)* 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 *P. vannamei/ P. monodon* brood stocking in India | Coastal Aquaculture Authority, Chennai | 11 September, 2018 |

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|---|---|---|---|
| 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 *(Labeo rohita)* 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 | 31st 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 *Clarias magur* 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 |

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| 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 | 4th Agri Leadership Summit, Sonepat, Haryana | 16 February, 2019 |
| Dr. K. Sreedharan | Increasing demand of value added fish products | 4th Agri Leadership Summit, Sonepat, Haryana | 16 February, 2019 |
| Mr. Ashok Kumar | White Shrimp Production – A major diversified economic activity | 4th Agri Leadership Summit, Sonepat, 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 r | International Trade | 3 November, 2018 r |
| Dr. Anjana Ekka | Scientist, ICAR- Central Inland Fisheries Research Institute, Barrackpore, r West Bengal r | 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 r | 26 February, 2019 r |
| Dr. S. N. Biswas | Former Joint Director, Department of Fisheries West Bengal | Prospect of entrepreneurship in fisheries and aquaculture in West Bengal r | 26 February, 2019 r |
| Dr. P. K. Mukhopadhyay | Former Head, ICAR- Central Institute of Freshwater Aquaculture, Bhubaneshwar | Status of feed based aquaculture in India r | 27 February, 2019 r |
| Dr. L. Kosygin Singh | Scientist-D, Zoological Survey of India, Kolkata, West Bengal | Freshwater fishes of India with reference to their diversity and conservation r | 1 March, 2019 r |
| Dr. T. J. Abraham | Professor, West Bengal University of Animal and Fishery Sciences, Kolkata, West Bengal | Fish health management: Bacterial disease and their control r | 2 March, 2019 r |

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|---|---|---|---|
| Dr. B. N. Paul | Principal Scientist, ICAR- Central Institute of Freshwater Aquaculture, Bhubaneshwar, 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 r | Cage culture technology | 6 March, 2019 |
| Dr. Prasanta Chatterjee | Research Coordinator, Krishi Vigyan Kendra, Nimpith, West Bengal r | Diversification of freshwater fish culture r | 8 March, 2019 r |
| Mr. Shibashish Das | Branch Head/Manager, Industrial Development Bank of India, Barasat, West Bengal | Development of viable project proposals r | 9 March, 2019 r |
| Dr. Swagat Ghosh | Ramakrishna Mission Vivekananda Educational & Research Institute, Kolkata, West Bengal | Breeding, culture & trading of marine ornamental fish r | 9 March, 2019 r |
| 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 r | 11 March, 2019 r |
| Mr. Avijit Kumar Koley | Farmer/Entrepreneur, Kolkata, West Bengal | Breeding & culture of monosex tilapia r | 11 March, 2019 r |
| Shri U. S. Tomar | Former Joint Director, State Fisheries Department, Govt. of MP r | Recent advances in aquaculture | 11 March, 2019 r |
| Dr. Prem Kumar | Scientist, ICAR- Central Institute of Brackishwater Aquaculture, Kakdwip, West Bengal r | Breeding techniques & culture strategies of brackishwater candidate species r | 12 March, 2019 r |
| Ms. Christina L. | Scientist, ICAR- Central Institute of Brackishwater Aquaculture, Kakdwip, West Bengal r | Prospect of mud crab culture | 12 March, 2019 r |
| Mr. Milon Sinha | Entrepreneur, Kolkata | Breeding and seed production of Magur | 12 March, 2019 r |
| Shri. Anil Saxena | Entrepreneur/Progressive Farmer, Kolkata | Introduction to recirculatory aquaculture system r | 12 March, 2019 r |
| Dr. S. Chowdhury | Assistant Professor West Bengal University of Animal and Fishery Sciences, Kolkata, West Bengal r | Recent advances in fish processing technology r | 13 March, 2019 r |
| Dr. Gadadhar Dash | Professor, West Bengal University of Animal and Fishery Sciences, Kolkata r | Parasitic diseases of fish & their control | 13 March, 2019 r |

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|---|---|---|---|
| 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- ULPGC-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 |

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|---|---|
| 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. Neriyang 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 |

### 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

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|---|---|
| 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 Iburahim | 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 r |

**59th Annual Conference of The Association of Microbiologists (AMI), University of Hyderabad, 9-12 December, 2018**

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

### 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

| | |
|---|---|
| Ms. Bahni Dhar | Changes in fatty acid profile, texture and colour of *Pangasianodon hypophthalmus* 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 (*L. vannamei*) based on polyphenol oxidase activity during chilled storage |

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

| | |
|---|---|
| Ms. Pushpa Kumari | Antiparasitic efficacy of organic and aqueous extracts of Neem (*Azadirachta indica*) leaf against *Argulus japonicus* in goldfish (*Carassius auratus*) 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, *Ellipsomyxa boleophthalmi* sp. nov. infecting gall Bladder of Brackishwater Fish, Mudskipper, *Boleophthalmus dussumieri* (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

| | |
|---|---|
| Mr. Abhinandan K. | Gender Analysis: Key to rejuvenate fisheries cooperatives for doubling fishers' income r |

### 14th Agricultural Science Congress on "Knowledge and Innovation Drivers for Growth of Aquaculture", National Agricultural Science Centre Complex, New Delhi, 20-23 February, 2019

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

| | |
|---|---|
| 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 |



| | |
|---|---|
| Mr. S. S. Lingam | Effect of prolonged stunting on growth and carcass quality of milkfish, *Chanos chanos* 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 *Labeo rohita* |
| 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

| | |
|---|---|
| Mr. Prasanta Jana | Dietary intervention for gonadal inhibition and complementary growth enhancement in *Labeo rohita* (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

| | |
|---|---|
| Mr. Bharat Yadav | Mapping activity, access and control profile in small scale ornamental fish production units in Maharashtra, India using Harvard analysis framework r |

### Global Conference on "Gender in Aquaculture and Fisheries-GAF 7" held at Asian Institute of Technology, (AIT), Bangkok, Thailand, 18-20 October, 2018

| | |
|---|---|
| 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 Iburahim | 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 |

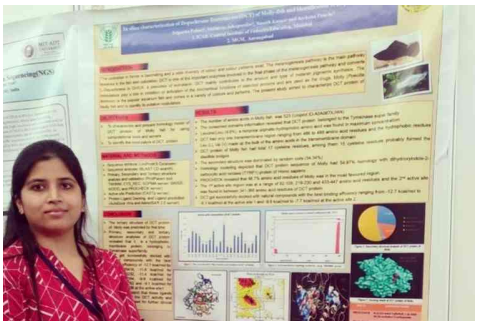
### International Conference on "Challenges and Opportunities for Sustainable Fisheries and Aquaculture Development (COSFAD 2019)", College of Fisheries, Shirgaon, Ratnagiri, 17-21 January, 2019

| | |
|---|---|
| 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 MBAI, Cochin | 02 April, 2018 |
| Ms. Abhilipsa Biswal | Best Poster Presentation Award; 3rd International Symposium on "Aquaculture and Fisheries Education (ISAFE3)", ICAR-Central Institute of Fisheries Education, Mumbai | 18 May, 2018 |
| Mr. Krishna Pada Singha | 2nd Prize in Poster Presentation; 3rd International Symposium on "Aquaculture and Fisheries Education (ISAFE3)", ICAR-Central Institute of Fisheries Education, Mumbai | 18 May, 2018 |
| Mr. Santhana Kumar | 2nd Prize in Oral Presentation Award ; 3rd International Symposium on "Aquaculture and Fisheries Education (ISAFE3)", ICAR-Central Institute of Fisheries Education, Mumbai | 18 May, 2018 |
| Ms. Nuzaiba P. Muhammed | 3rd Prize in Poster Presentation; 3rd International Symposium on "Aquaculture and Fisheries Education (ISAFE3)", ICAR-Central Institute of Fisheries Education, Mumbai | 18 May, 2018 |
| Mr. Sutanu Karmakar | 3rd Prize in Oral Presentation; 3rd International Symposium on "Aquaculture and Fisheries Education (ISAFE3)", ICAR-Central Institute of Fisheries Education, Mumbai | 18 May, 2018 |
| Ms. Tenji Pem Bhutia | 4th Prize in Oral Presentation; 3rd International Symposium on "Aquaculture and Fisheries Education (ISAFE3)", ICAR-Central Institute of Fisheries Education, Mumbai 18 May, 2018 | 18 May, 2018 |
| Ms. Sajina K A | 5th Prize in Oral Presentation; 3rd 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 Maharastra and Marine Life of Mumbai | 12 January, 2019 r |
| Ms. Bhargavi Priyadarshini | Best Oral Presentation; Award 31st 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; AwardInternational Conference on "Challenges and Opportunities r for Sustainable Fisheries and Aquaculture r 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; 84th National Youth Convention, JNKVV, Jabalpur, MP | 16 February, 2019 r |
| Mr. Tapas Paul | AIASA National Gold Medal; 4th 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; 3rd 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 |

# 05 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

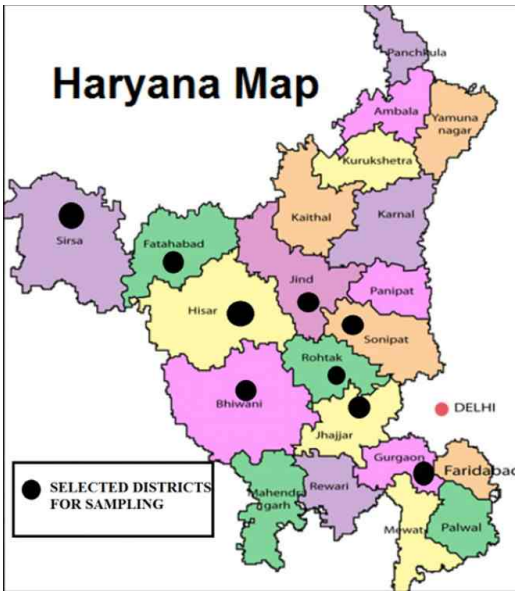
*Kiran Dube Rawat, N. K. Chadha, Paramita B. Sawant, Babitha Rani, Madhuri Pathak, Narendra Aglave, Ashok Kumar* r

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 Shirsa 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




Map showing locations of sampling 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

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 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

Horizontal column mode filtration device

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

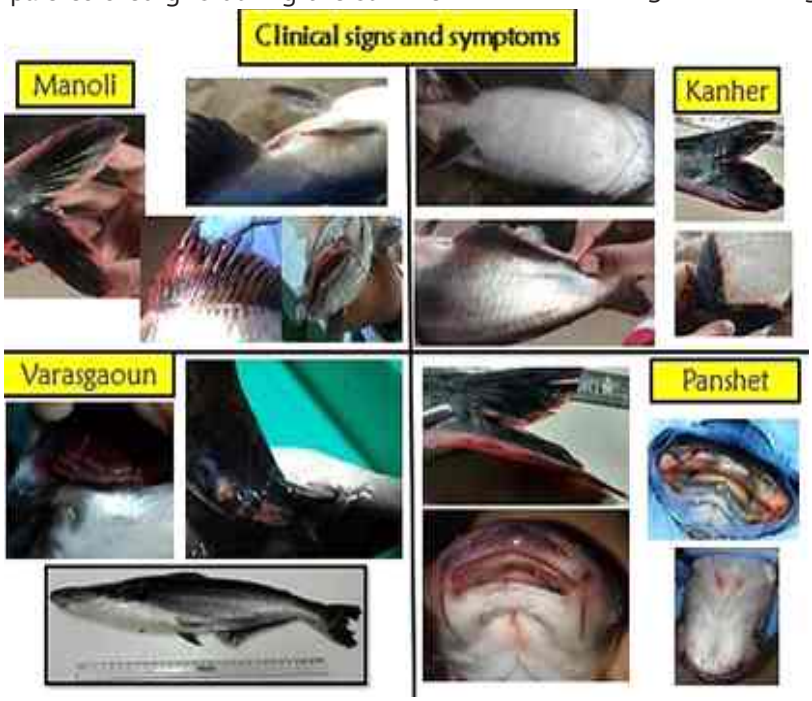
## Disease pattern and health assessment of *Pangasianodon hypophthalmus* in cage culture ecosystem

2017-2019 r

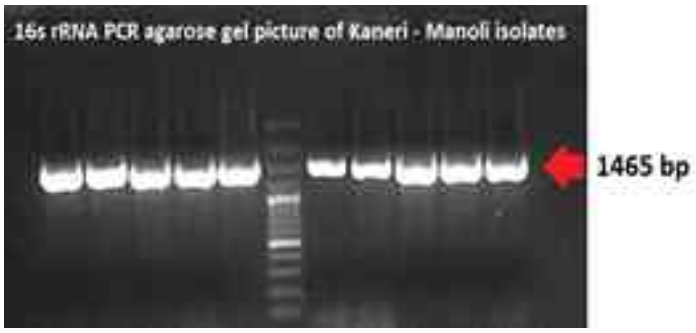
*Gayatri Tripathi, Kiran Dube Rawat, Shashi Bhushan, Husne Bano and Rathi Bhuveneshwari* r

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

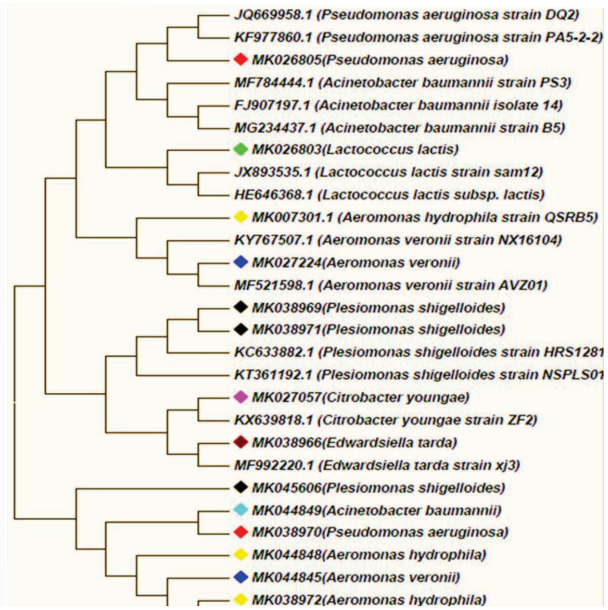
The sampling was conducted in Kanher, Manoli, Varasgaon and Panchet reservoirs during summer, winter and rainy season. The physico-chemical parameters of water showed a significant difference between the seasons. The catfish exhibited petechial haemorrhages on the body surface, lesions on the fins and 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



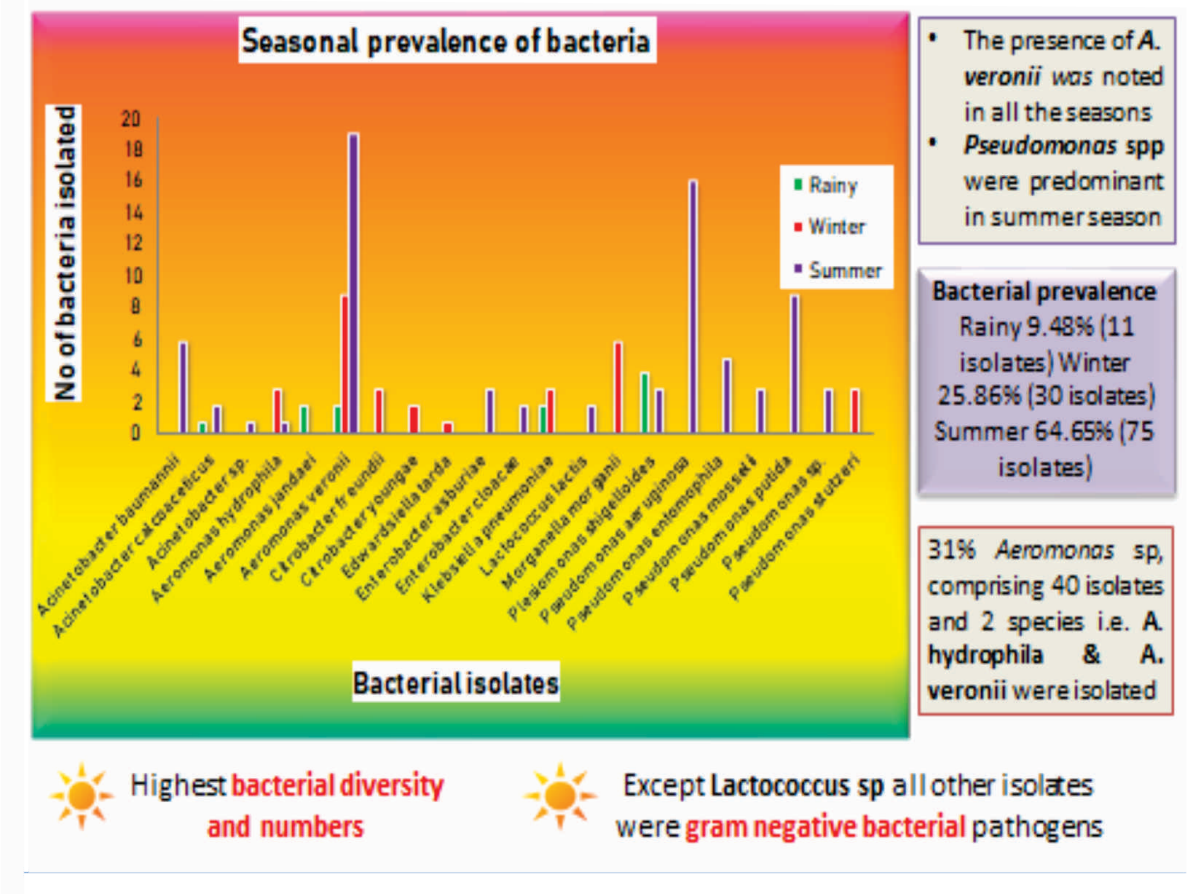

The fish exhibited petechial hemorrhages on the body surface, lesions on the fins and reddening around the mouth region r




Amplification of 16S rRNA genes of bacterial isolates




Phylogenetic Tree of the isolated bacterial pathogens r



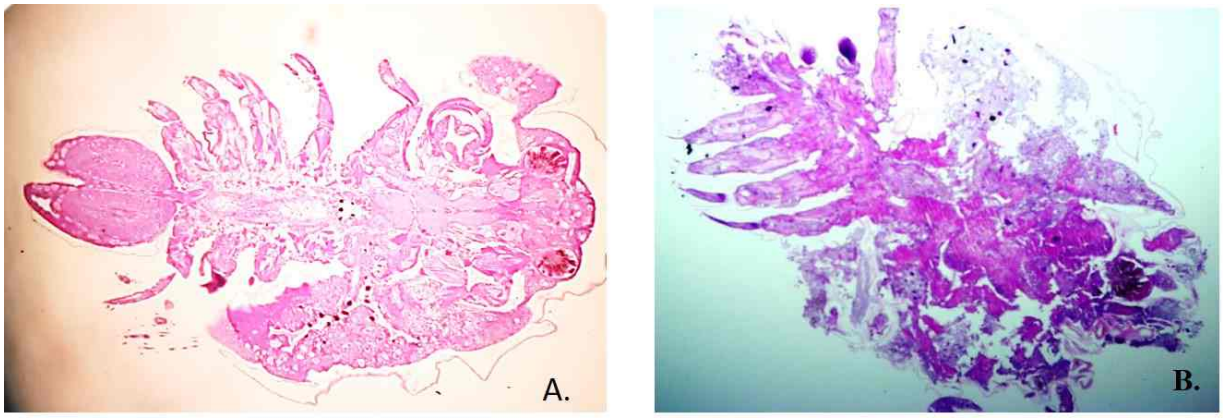

Seasonal prevalence of bacterial pathogens r

## Developent of phytotherapy against *Argulus* parasite of fish

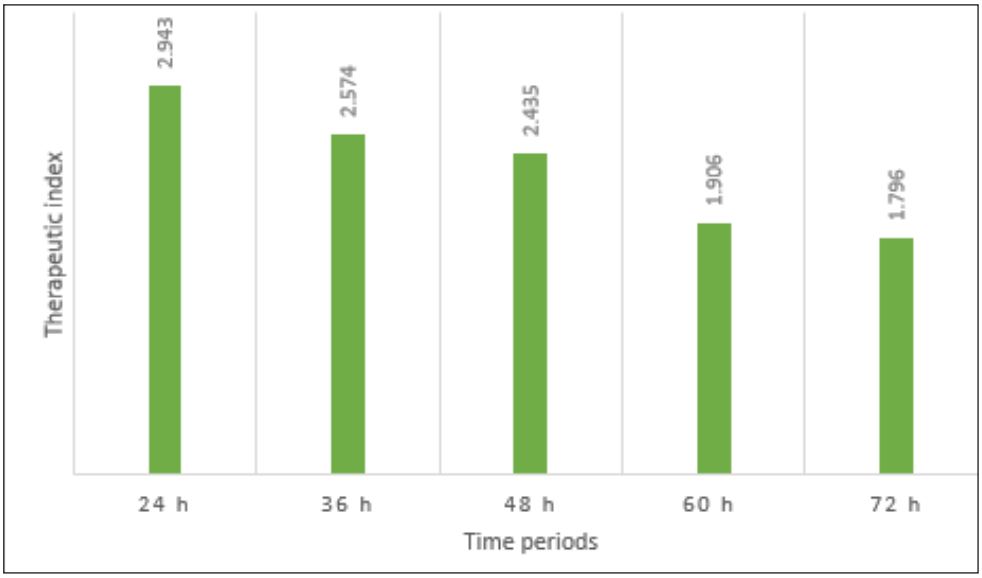
2017-19 r

*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 hypogea*** 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

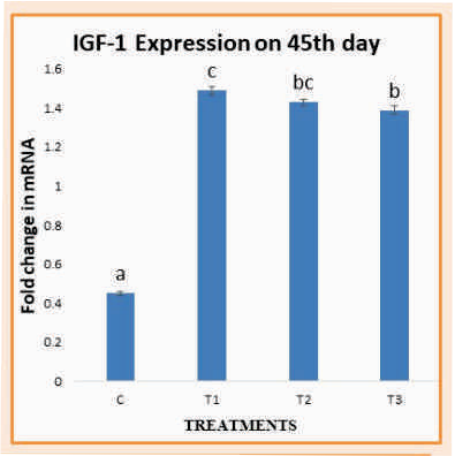
There was depletion in growth with the inclusion of *Mentha arvensis* leafmeal, even at 10% inclusion in inland saline water.

***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* r (10%); T2- inclusion level of *Ipomeaa quatica* (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. 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

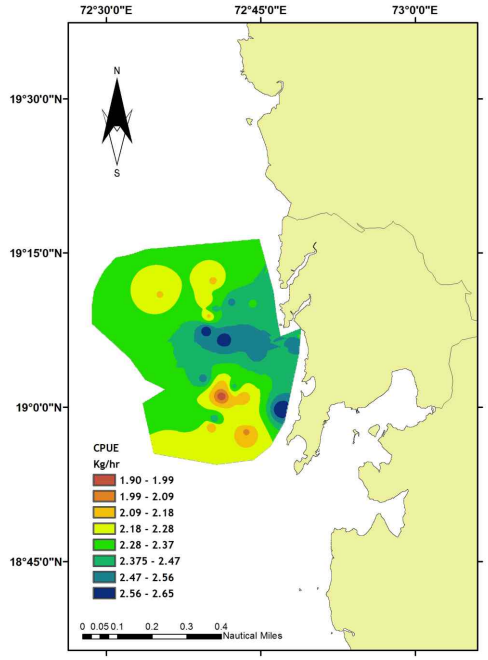
## Effect of extraneous factors on trophic chain linked to non-conventional resources for sustainable management

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*, *Trypaucehen 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%). r

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 dussurmeiri, Squila, Johniops microrhyms, J. batangeri, J. vogleri, Loligo* r sp., *B. macaleangi, T. theraps* and *Harpadon nehereus*. 3 species of prawns and acetes were also noted. r

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 foroptimizing the anti-oxidant value of fish products. r

## Taxonomic evaluation of selected teleosts occurring in Indian waters

2016-19 r

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

*Technical Associates: Satish Kamat, Pawan Kumar* r

A total of 35 species belonging to Mugilidae, Hemiraphidae and Exocoetidae have been 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 form 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* r lacking pelvic fin were recorded. Two specimens of *Hemiramphus limabtus* with deformed beak were recorded. Morphotypes of *Cheilopogon spilopterus* r were collected and are being analyzed for their characters in depth for confirmation. New distributional range of *H. pelagicus* r (first report form West Coast of India) has been noticed. r

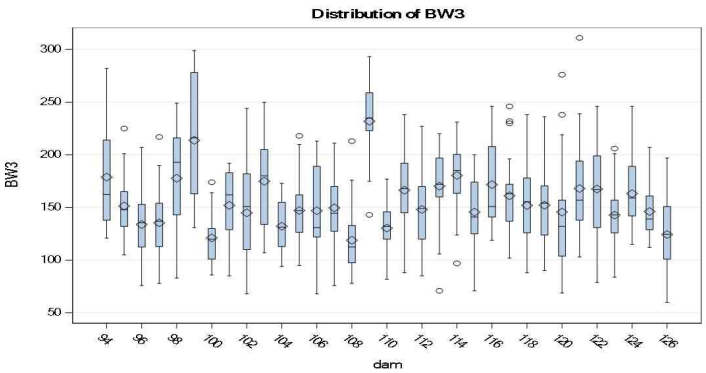
## Genetic improvement in *Clarias magur* (Linnaeus, 1758) through selective breeding and gene banking

2017-22 r

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

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

Selective breeding of magur r




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

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

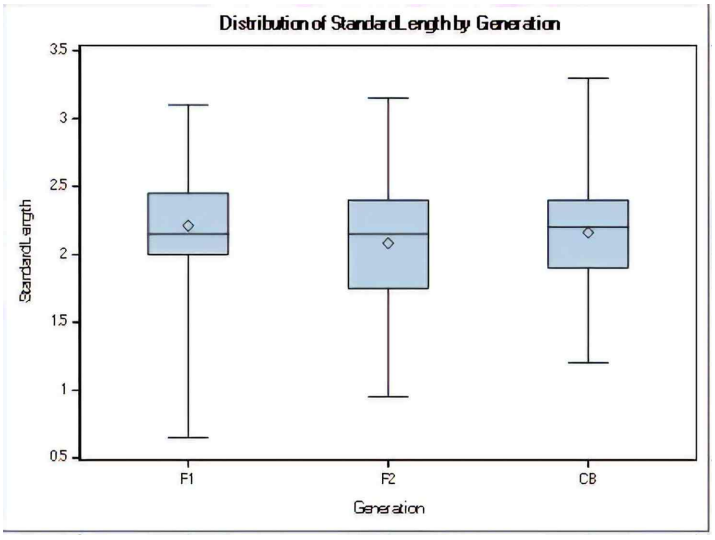
## Development of inbred lines of zebrafish and assessment of inbreeding depression

2015-18 r

*Gopal Krishna, Mujahidkhan Pathan, Shrinivas Jahageerdar, 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* r

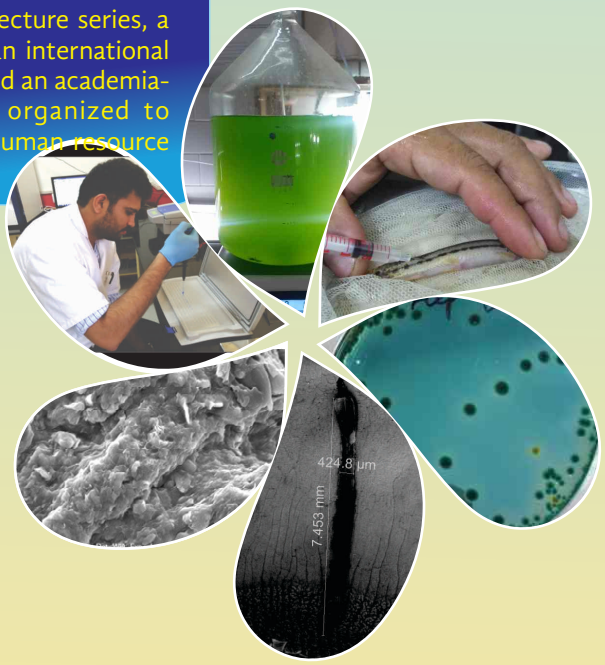
Yearly Inland fish production data of last 57 years were obtained from Maharashtra fisheries department. Quarterly inland fish production of all the district of Maharashtra of different region were obtained from the year 2012-13 to 2017-18. The meteorological data for the three states, Maharashtra, Gujarat and Madhya Pradesh had been requested to Indian Meteorological Department, Pune, and it was received in the month of January-Feburay 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. r

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. r

# 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 r



## 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

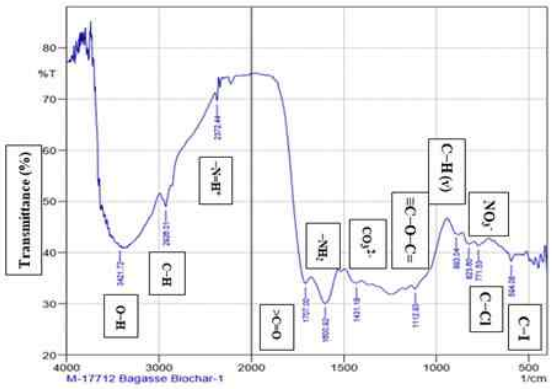
**RS & GIS based mapping of extent and spatial distribution of inland saline water:** Base maps of salt affected areas for Rohtak and Jhajjar districts of Haryana have been prepared. Pre and post-monsoon map of inland water bodies of Rohtak and Jhanjhar districts of Haryana have been prepared. For pre-monsoon 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 Jhajhar 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

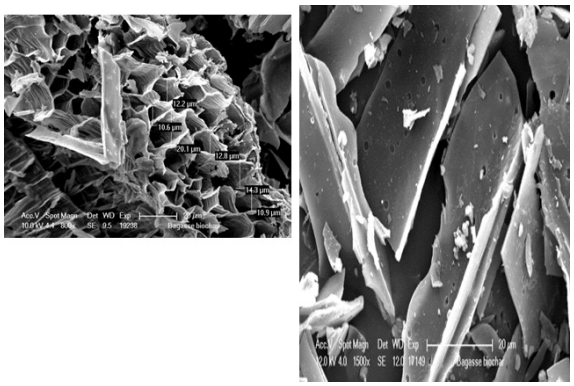
**Collection and analysis of soil, water samples and farmers knowledge information along with GPS co-ordinates (pre and post-monsoon)**: Study area and sampling plan for collection of soil & water samples include five districts (Rohtak, Jhajjar, Fazilka, Sriganganagar and Mathura) in 4 states of Haryana, 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 inbiochar r

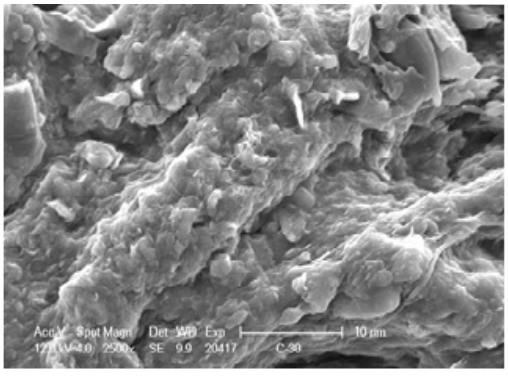


Biochar under scanning electron microscope. r

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/ 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 schoenitebiochar 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. r

**Biofloc technology for sustainable effluent management in aquafarming**

Experimental Biofloc unit at Rohtak r



Biofloc under scanning electron microscope r

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* r biofloc production. An experimental ex-situ biofloc unit was set up in Rohtakcenter 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 Re-circulatory 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. r

**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 r

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), 6were 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 $m^2$). 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 $m^2$). 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 $m^2$ 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*) Chlorophceae (*Chlorella*) and Dinoflagellates (*Peridinium*, *Gymnodinium*).

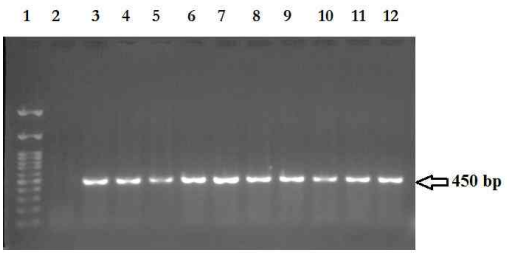
Trials on growth of seaweed in ISW earthen ponds r

**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* r isolates were obtained, of which 62 were identified as *V. parahemolyticus*. r

TCBS plate showing colonies of *Vibrio* spp r




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. parahemoloyticus* ISW samples with *tlh*-specific PCR r

**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. parahaemolyticus* r 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. r

**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. r

**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 r 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

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

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



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 r 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

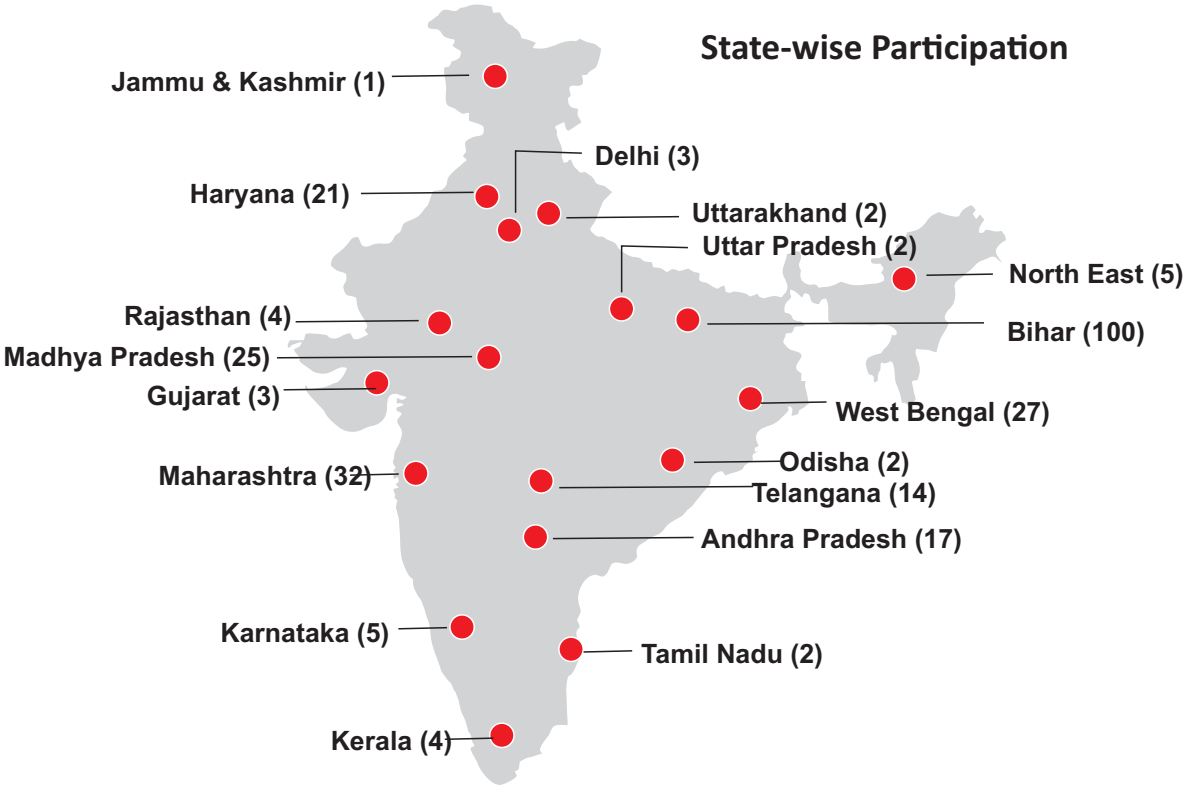
**Total Participants 269**

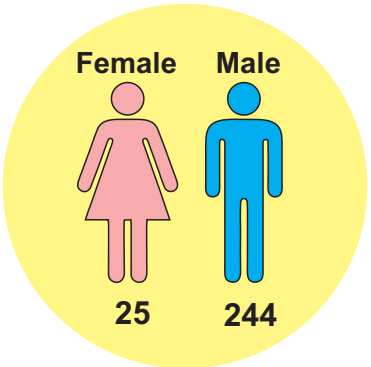
**Venues**
CIFE HQ 3
Centres 5

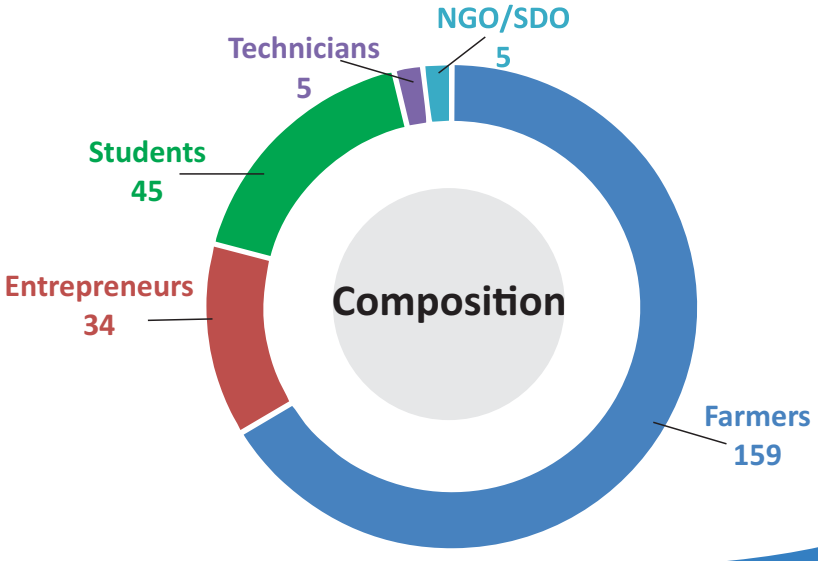
**Educational Qualification**


- Matriculation & Below 199
- Diploma 10
- Undergraduation 28
- Post Graduation 27
- Ph.D. 5

## State-wise Participation



# 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. Rathi Bhuvaneswari r

Rs. 38.927 Lakhs r

The growth medium formulated for biomass production was further modified by supplementing with graded concentrations of sodium nitrate (10-40ppm) 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 $NaNO_3$ r showed highest growth rate (0.76) and corresponding doubling time was lowest (0.91 days). Ammonium chloride supplementation (1-4ppm) 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. r

Phycocyanin (Pc) extraction through repeated freezing and thawing of the harvested biomass (0.8mg 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. r

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

Phycocyanin (Pc) extracted from algae r

## 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

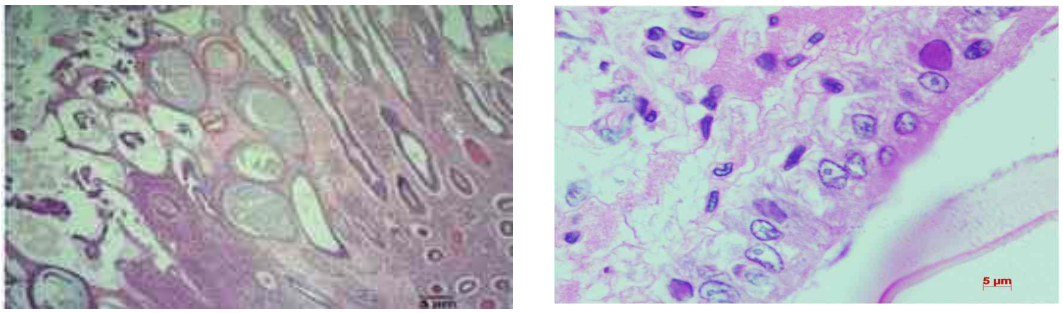



Fig. Histological section of hepatopancreas showing enlargement of haemal sinuses, haemocytic aggregation, nodule formation and melanisation due to acute bacterial infection r

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

2017-2020

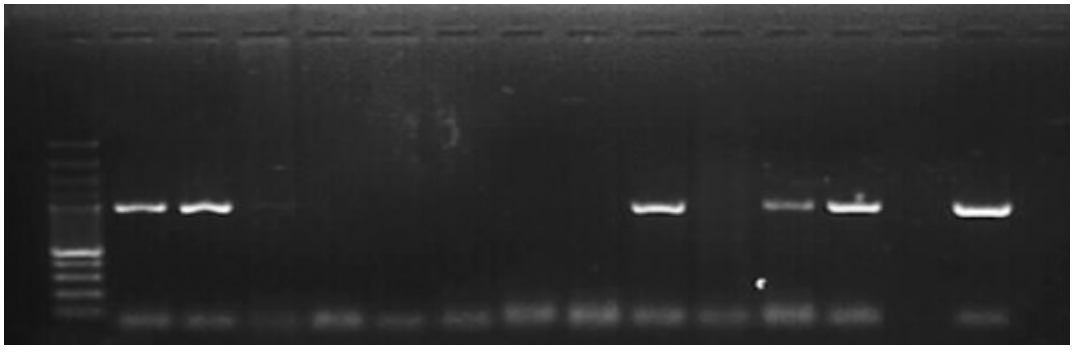
K.V. Rajendran, K. Pani Prasad r

Rs. 98.683 lakhs r

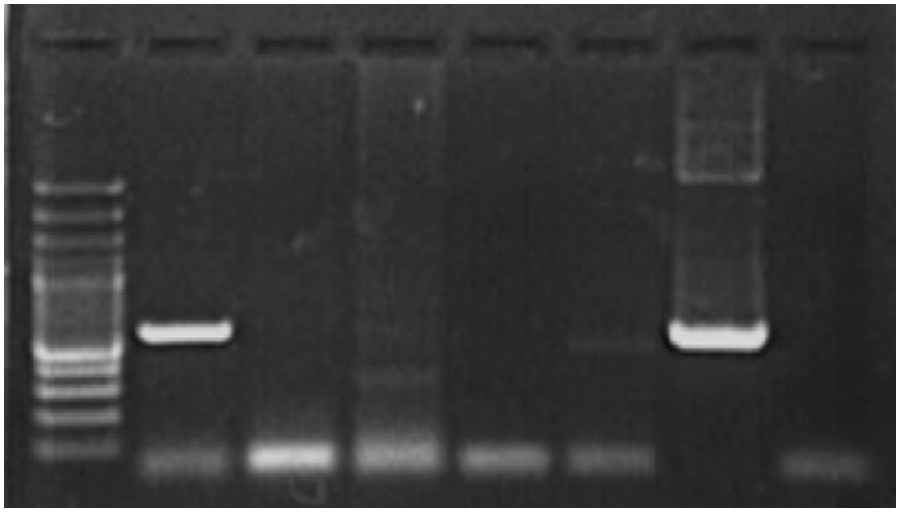
The goal of this research project is the establishment of repository for the finfish and shellfish viruses. Molecular screening of shrimp samples (using PCR) were carried out for white spot syndrome virus (WSSV), infectious hypodermal and hematopoietic necrosis virus (IHHNV), monodon baculovirus (MBV), 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

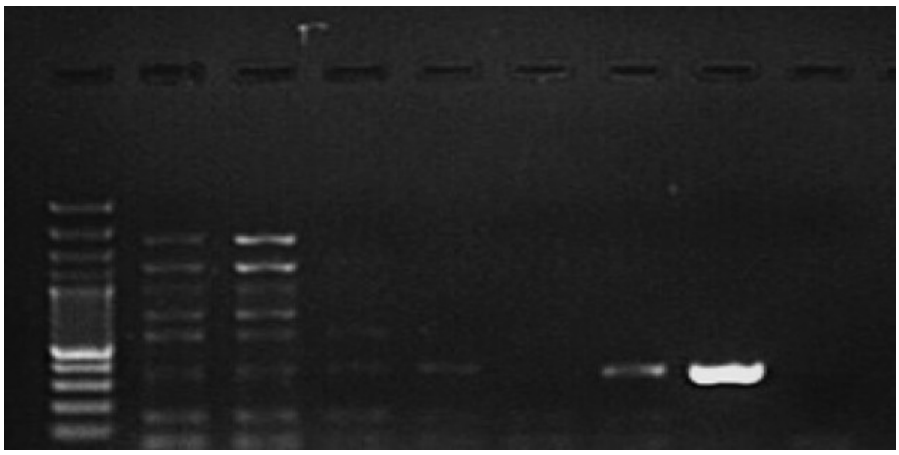
Isolation of viruses using cell line: Snakehead-fish cell line (SSN-1) which was cryopreserved and stored in liquid nitrogen in the Cell Culture Laboratory was used in the experiment. The cryopreserved SSN-1 cell line was revived and cultured in 25 $cm^2$ r tissue culture flask containing L-15 culture 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* r 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

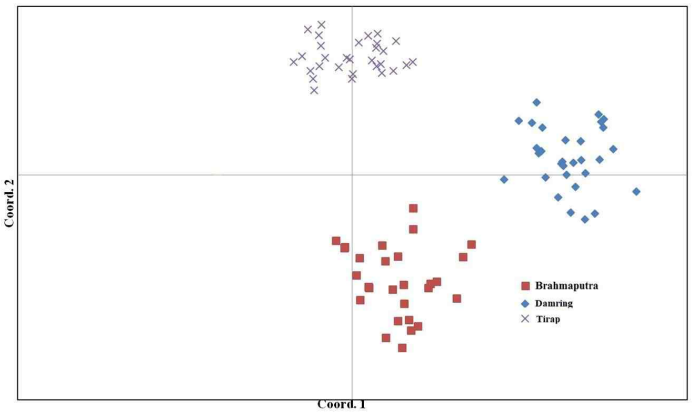



**Fig**. 1. Scatter diagram based on PCoA of distance variables among populations of *L. marginalis* r

## Protein expression profiling of *Labeo rohita* using quantitative proteomics

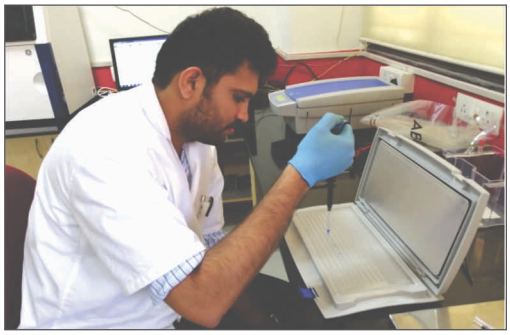
2017-20

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* r (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



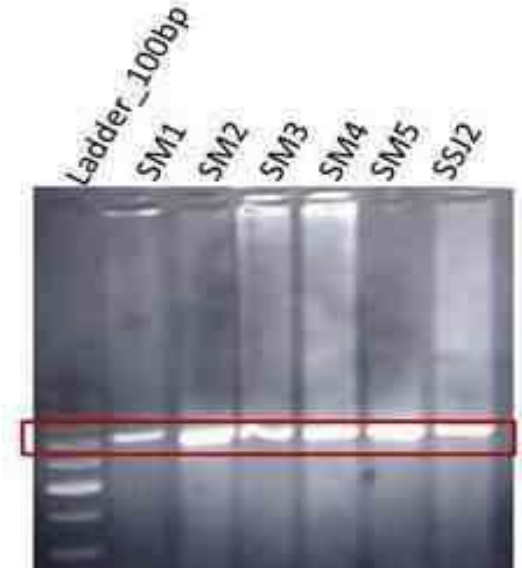
2D gel electrophoresis and imager installed at FGB Division, CIFE. r

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

2017-20

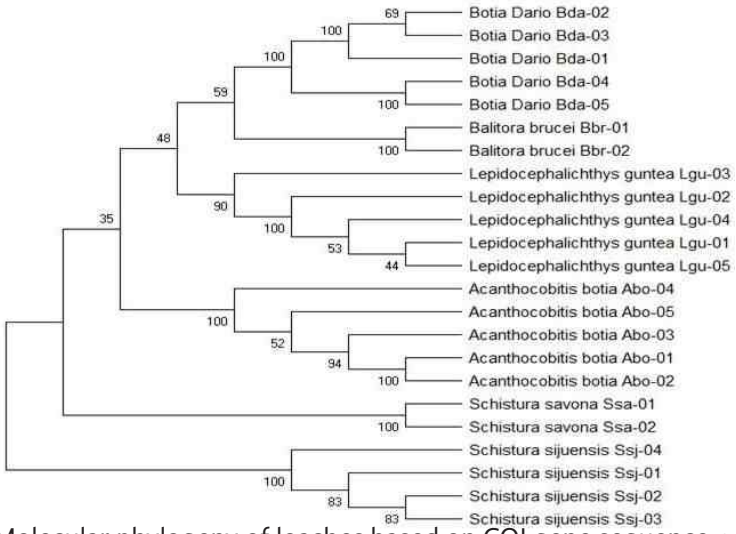
Mukunda Goswami, R. Nath (St. Anthony's College, Shillong), Annam Pavan Kumar, R N Bhuyan (St. Anthony's College, Shillong)

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 (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$^{0}$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, Devario 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* r 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 (18-21oC), 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-$\alpha$ (TNF-$\alpha$) 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 $m^2$ 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 though 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, osmoregualtory and stress associated genes through real time PCR based gene expression. Hepatopancreas was preserved in sucrose and stored at -20$^0$ freezer for the determination of stress-associated enzymes.

*L. 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

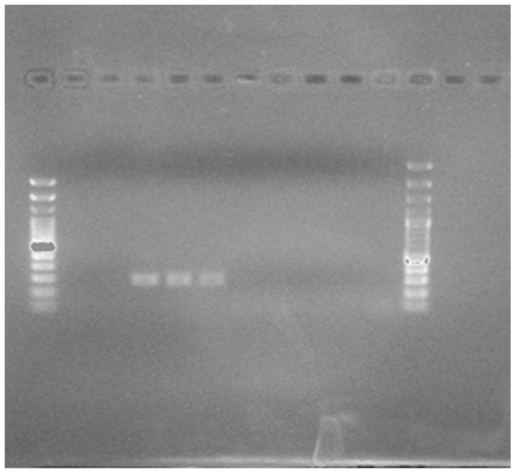
2018-20

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, Cephems, Carbapenems, Aminoglycosides, Tetracyclins, Quinolones, Folate pathway inhibitors, Phenicols, Macrolides and Polymixins; *Vibrio* sp. were screened for resistance to beta lactams, Cephems,

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 Phenicols. *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, Phenicols, 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-NBFGR, 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, *Aplocheilus* 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 crenuchoides, 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 r *Vallisnaria, Hydrilla* for broodstock development under captive condition. Specimens of the high fin barb, *Orichthys crenuchoides* 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* to bacterial pathogens *Flavobacterium columnare* and *Edwardsiella tarda*

2015-2020

Megha K. Bedekar, Kundan Kumar, Saurav Kumar

Rs. 145Lakhs

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.

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

2017- 2020 ICAR, New Delhi

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

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.

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

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 r 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 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

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

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. /m $^2$ 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 r

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 r

## National Fisheries Development Board

### National surveillance programme for aquatic animal diseases

2013-18

K. Pani Prasad, R. P. Raman r

Rs. 149.70 Lakhs r

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

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. r

## 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

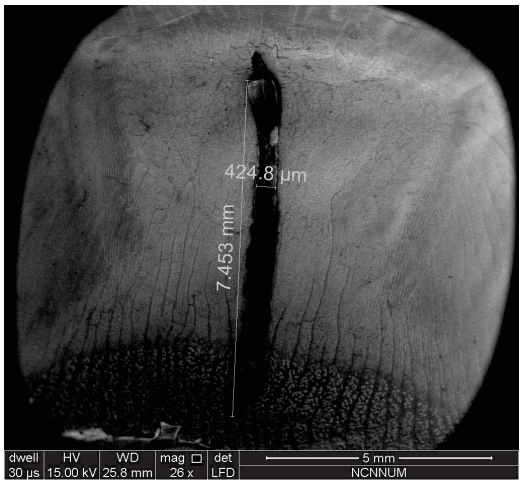
2015-18

Annam Pavan Kumar

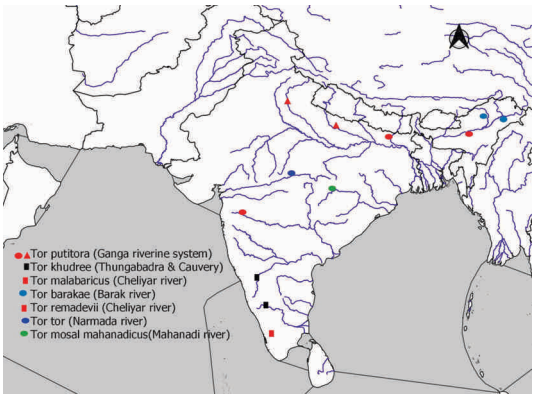
25.8 Lakhs r

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

# 06 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 | Rajastan, Kerala, Gujarat |
| *Bihar me Machhali Palan me Unnat Taknik avm Pravandhan* | 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 | Telengana, 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 |
| *Mithe Pani Me Machhli Palan* | 08-14 August, 2018 | 17 | Aurangabad, Bihar |
| *Mithe Pani Me Machhli Palan* | 08-14 August, 2018 | 17 | Gaya, Bihar |
| *Mithe Pani Me Machhli Palan* | 21-27 August, 2018 | 16 | Bhojpur, Bihar and Pashim Medinipur, West Bengal |
| *Mithe Pani Me Machhli Palan* | 21-27 August, 2018 | 16 | Banka, Bihar |
| Biotechnological Application in Aquaculture | 3-7 September, 2018 | 07 | Andhra Pradesh, West Bengal, Assam, Maharashtra |
| *Mithe Pani Me Machhli Palan* | 11-17 September, 2018 | 16 | Buxar, Bihar and Kamrup, Assam |
| *Mithe Pani Me Machhli Palan* | 11-17 September, 2018 | 15 | Jehanabad, Bihar |
| Orientation Programme for MFSc Students | 13-16 September, 2018 | 09 | Mumbai, Maharashtra |
| *Mithe Pani Me Machhli Palan* | 04-10 October 2018 | 15 | Kishanganj, Bihar |
| *Mithe Pani Me Machhli Palan* | 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 |
| *Mithe Pani Me Machhli Palan* | 04-10 December, 2018 | 14 | Supaul, Bihar |
| *Mithe Pani Me Machhli Palan* | 04-10 December, 2018 | 15 | Araria, Bihar |
| *Mithe Pani Me Machhli Palan* | 04-10 January, 2019 | 16 | Katihar, Bihar |
| *Mithe Pani Me Machhli Palan* | 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 |
| *Mithe Pani Me Machhli Palan* | 12-18 February, 2019 | 15 | East Champaran, Bihar |
| *Mithe Pani Me Machhli Palan* | 12-18 February, 2019 | 15 | West Champaran, Bihar |
| Modern method of fish culture | 21-23 February, 2019 | 13 | Amravati, Maharshtra |
| Integrated Aquaculture | 22-24 February, 2019 | 50 | Chandel, Manipur |
| Ornamental fish breeding & culture | 23-27 February, 2019 | 29 | Ranchi, Jharkhnad |
| 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 |
| Inplant 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 (*Litopenaeus vannamei*) 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 |
| *Litopenaeus vannamei* Farming Using Inland Saline Water | 17-21 December, 2018 | 17 | Haryana, Punjab and Madhya Pradesh r |
| *Litopenaeus vannamei* 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 (*Clarias magur*) 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 Managemnet | 06-20 August, 2018 | 12 | Mumbai, Maharashtra |
| Fresh Water Prawn (*M. rosenbergii*) 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, Maharshtra |
| 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<br>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 *Clarias magur* 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 |
|---|---|---|
| 3rd International Symposium on "Aquaculture and Fisheries Education (ISAFE3) Theme: Fisheries Education for Sustainability Blue Economy" | 16-18 May, 2018 | ICAR-CIFE, Mumbai |
| 22nd National Agriculture Exhibition (Fishery) | 03 - 06 August, 2018 | Milan Samity Maidan, Nimta, Kolkata |
| 19th 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 *Clarias magur* Present Status and Future" | 16 March, 2019 | FWFF, Balabhadrapuram, ICAR-CIFE, |
| "Matsya Samridhi Mela" and 73rd 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. r

### 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 r

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. r

### 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. r

### 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 r

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" r 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, Maharshtra from 31st r 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±91g and length 14.2-15.10 cm were used for stocking. There were 4 stocking densities i.e., 10, 15, 20 and 25/$m^2$ with different feeding rations 3%, 4%, 5% and 6% of body weight throughout the culture . The stocking density 10/$m^2$ 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 Paranirbharsil 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 Sakenge Maja* | Dainik Bhaskar, Hoshangabad Itarsi *(Ed.)*, MP r | 06 January, 2019 r |
| 9. | *Aab Fish Se Bane Cutlet Aur Achar Ka Log Le Sakenge Maja* | Dainik Bhaskar, Hoshangabad Itarsi *(Ed.)*, MP | 06 January, 2019 |
| 10. | *Machali Palne Vale Kisan Amdani Badhane Ab Bana Sakenge Fish Cutlet* | Dainik Bhaskar, Hoshangabad Itarsi *(Ed.)*, MP r | 07 January, 2019 r |
| | | Patrika, Itarsi *(Ed.)*, MP | 07 January, 2019 |

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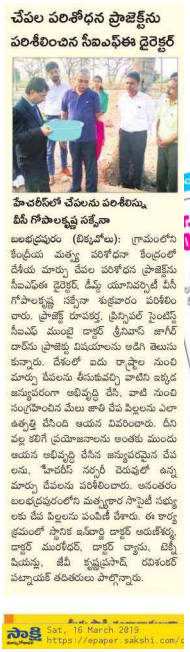
|---|---|---|---|
| 12. | *Matshya Byanjan Banana Ke Diye Tips* | Pradesh Today, MP | 07 January, 2019 |
| 13. | *Machhli Palan Se Khushal Honge Kisan* | Dianik Jagran | 11 January, 2019 |
| 14. | *Sangha Khawitute Tan Training* | Mamit Tomes, Mamit, Mizoram | 24 January, 2019 |
| 15. | Skill Development training for Chandel fish farmers | Sanghai Express, Imphal, Manipur | 01 March, 2019 |
| 16. | Training on Integrated Aquaculture at Kiphire | The Morning Express, Nagaland | 05 March, 2019 |
| 17. | Villagers trained on integrated aquaculture | Nagaland Page | 05 March, 2019 |
| 18. | Dumardah Chour Men Koushal Vikas Ke Tahat Pahli Bar Le Rahe Kisan Machhli Palan Ke Unnat Taknik Evm Prabandhan Par Prashikshan | Bhaskar News, Samastipur & r Muzaffarpur (*Ed.*) r | 12 March, 2019 r |
| 19. | *Kisan Jeera Utpadan Kar Bhi Achhchhi Kamai Kar Sakte Hai* | Dainik Bahskar Samastipur & Muzaffarpur (*Ed.*) r | 15 March, 2019 r |
| 20. | *Prashikshan Le Sunahle Sapne Saja Rahe Kisan* | Hindustan Samastipur & Muzaffarpur (*Ed.*) r | 15 March, 2019 r |
| 21. | Jal Ko Sansadhan Ke Roop Men Dekhe Kisan | Prabhat Khabar | 16 March, 2019 r |
| 22. | *Kisan Kam Jamin Men Machhli Palan Kar Ban Sakte Hai Udyami* | Dainik Bhaskar Samastipur & Muzaffarpur (*Ed.*) r | 16 March, 2019 r |
| 23. | *Kisano Ne Sikha Machhli Palan Ke Unnat Taknik Evam Prabandhan Ke Gudh* | Tarun Mitra, Samastipur & Muzaffarpur (*Ed.*) r | 16 March, 2019 r |
| 24. | *Sokhh Thekei Barti Uparjan, Jhok Barchhe Rangin Maachh Chaser* r | Bartaman Patrika | 27 March, 2019 r |


చేపల పరిశోధన ప్రాజెక్ట్‌ను పరిశీలించిన సీఐఎఫ్ఈ డైరెక్టర్



హేచరీస్‌లో చేపలను పరిశీలిస్తు... వీసీ గోపాలకృష్ణ సక్సేనా

బలభద్రపురం (బిక్కవోలు): గ్రామంలోని కేంద్రీయ మత్స్య పరిశోధనా కేంద్రంలో దేశీయ మార్పు చేపల పరిశోధన ప్రాజెక్ట్‌ను సీఐఎఫ్ఈ డైరెక్టర్, వీసీ యూనివర్సిటీ వీసీ గోపాలకృష్ణ సక్సేనా శుక్రవారం పరిశీలించారు. ప్రాజెక్ట్ చీఫ్ పరికర్త, ప్రిన్సిపల్ సైంటిస్ట్ సీఐఎఫ్ ముంబై డాక్టర్ శ్రీనివాస్ జాగీదార్‌ను ప్రాజెక్ట్ విషయాలను అడిగి తెలుసుకున్నారు. దేశంలో ఏడు రాష్ట్రాల నుంచి మార్పు చేపలను తీసుకువచ్చి వాటిని ఇక్కడ జన్యుపరంగా అభివృద్ధి చేసి, వాటి నుంచి సంగ్రహించిన మేలు జాతి చేప పిల్లలను ఎలా ఉత్పత్తి చేసింది ఆయన వివరించారు. దీని వల్ల కలిగే ప్రయోజనాలను అంతకు ముందు ఆయన అభివృద్ధి చేసిన జన్యుపరమైన చేపలను, హేచరీస్ నర్సరీ చెరువులో ఉన్న మార్పు చేపలను పరిశీలించారు. అనంతరం బలభద్రపురంలోని మత్స్యగార సాసైటీ సభ్యులకు చేప పిల్లలను పంపిణీ చేశారు. ఈ కార్యక్రమంలో స్థానిక ఇన్‌చార్జి డాక్టర్ అయుశ్‌కుమార్, డాక్టర్ మురళీధర్, డాక్టర్ చ్యామ, టెక్నీషియన్లు జేపీ కృష్ణప్రసాద్, రవిశంకర్ పట్నాయక్ తదితరులు పాల్గొన్నారు.

సాక్షి Sat, 16 March 2019 https://epaper.sakshi.com/


ఈనాడు తూర్పుగోదావరి

పరిశోధనల ఫలితాలు రైతులకు అందేలా కృషి'



చేపపిల్లల్ని రైతులకు అందజేస్తున్న గోపాలకృష్ణ సక్సేనా


ఈనాడు




సమావేశంలో ప్రసంగిస్తున్న శాస్త్రవేత్త డా.శ్రీనివాస జగీదార్

'మార్పుజాతి చేపలతో మత్స్య రైతులకు లాభం'

బలభద్రపురం(బిక్కవోలు), మార్చి11: బలభద్రపురంలోని కేంద్రీయ మత్స్యక్షేత్రంలో పరిశోధనలు చేసి, జన్యుపరంగా అభివృద్ధి చేసిన మార్పుజాతి చేపపిల్లల్ని రైతులకు అందిస్తున్నామని శాస్త్రవేత్త డా.శ్రీనివాస జగీదార్ తెలిపారు. శనివారం స్థానిక కేంద్రీయ మత్స్య క్షేత్రంలో భారతీయ వ్యవసాయ పరిశోధనా మండలి, కేంద్రీయ మత్స్య విద్యానంస్థ కాకినాడ వారు మత్స్యరైతులకు నిర్వహించిన అవగాహన సదస్సులో ఆయన పాల్గొని ప్రసంగించారు. ఇవి ఆరు నెలల్లోనే దాదాపు 150 నుంచి 200 గ్రాముల సైజు పెరుగుతాయన్నారు. వెటర్నరీ యూనివర్సిటీకి చెందిన విశ్రాంత డీన్ గోపాలరావు మాట్లాడుతూ సీఐఎఫ్ఈ కారణంగా ఉభయగోదావరి జిల్లాల్లో మత్స్యవిప్లవం బాగా అభివృద్ధి చెందిందని, జన్యుపరంగా అభివృద్ధి చేసిన మార్పు చేపపిల్లలు తగ్గరగా పెరిగి రైతుకు లాభదాయకంగా మారుతుందన్నారు. కోలేకతాలోని సీఐఎఫ్ఈ ప్రిన్సిపల్, శాస్త్రవేత్త మహాపాత్రో మాట్లాడుతూ ఈ రకం చేపలు తక్కువ సీటిలో పెరుగుతాయన్నారు. సమావేశంలో కాకినాడ సి.ఐ.ఎఫ్.ఇ. ఆఫీసరు ఇన్‌చార్జి డా.మురళీధరరావు, స్థానిక చేపల కేంద్రం ఇన్‌చార్జి డా.అయుష్ శర్మ, డా.భాను, డా.ప్రసాద్, రవిశంకర పట్నాయక్, మూర్తి, కొప్పూరి రాధాకృష్ణారెడ్డి రైతులు పాల్గొన్నారు

## 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 | Besant Montessori School, The Theosophical Colony, Mumbai | 31 r |
| 02 August, 2018 | Ramnarain Ruin Autonomus 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, Behrampur, Odisha r | 34 r |
| 05 February, 2019 | Chhattisgarh Kamdhenu Vishwavidalaya, 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, Sundarianandа 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 3rd 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 3rd 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 r | 19 |
| 22–24 November, 2018 | Exposure Visit Programme of students from Fishery College & Research Institute of Tuthikodi, Tamil Nadu r | 35 r |
| 02–04 December, 2018 | Exposure Visit Programme of BFSc 3rd year students from College of Fisheries, Ratnagiri, Maharashtra | 29 r |
| 15 December, 2018 | Exposure Visit Programme 3rd year B.Sc fishery students from St. Anthony College, Shillong, Meghalaya r | 17 r |
| 18 December, 2018 | Exposure Visit Programme of fish farmers from Panagudi, Nagapattinam, Tamilnadu r | 15 r |
| 20 December, 2018 | Exposure Visit Programme of State Fisheries Officers from Kerala State Fishery Department r | 07 r |
| 24 December, 2018 | Exposure Visit Programme of students from Bidhan Chandra College, Asansol r | 06 r |
| 8 January, 2019 | Exposure Visit Programme for BFSc 4th year students from College of Fisheries, GADVASU, Punjab r | 15 r |
| 9 January, 2019 | Exposure Visit Programme for BFSc 4th year students from College of Fisheries, Lembuchera, Tripura r | 26 r |
| 9 January, 2019 | Exposure Visit Programme for BFSc final year students from WBUAFS, Chagaria, West Bengal r | 20 |
| 11 February, 2019 | Exposure Visit Programme of students from College of Food Technology, Kerala r | 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. 3rd 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 (5th Semester) students, Suraj (PG) Degree College, Mahendergarh District, Haryana r | 40 r |
| 25 October, 2018 | B.Sc. Medical (3rd 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**

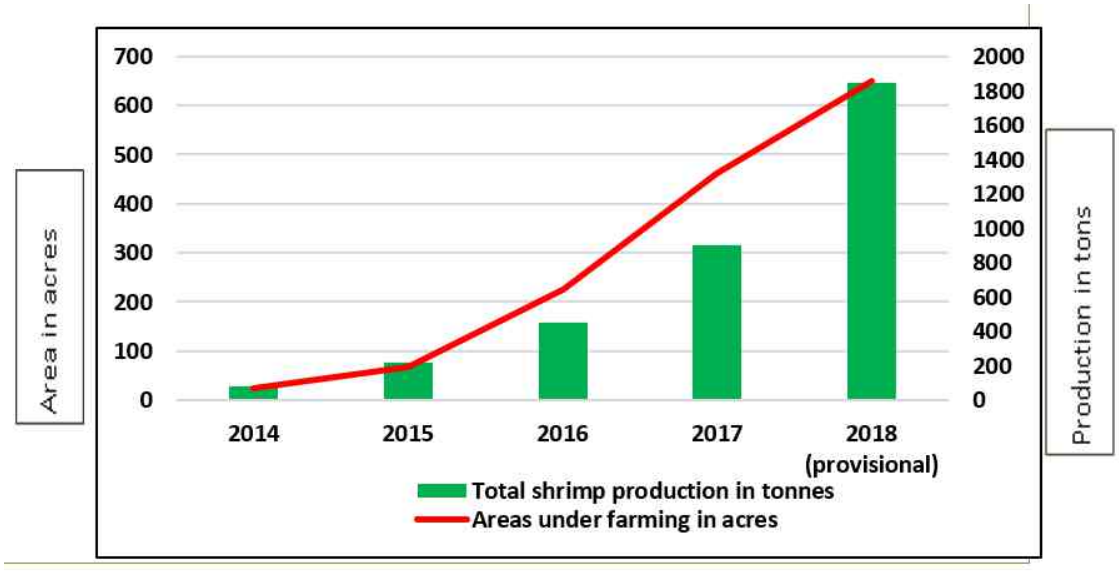
Demonstrated in : Haryana, Punjab, Rajasthan, Western UP region

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, Sonipat, 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

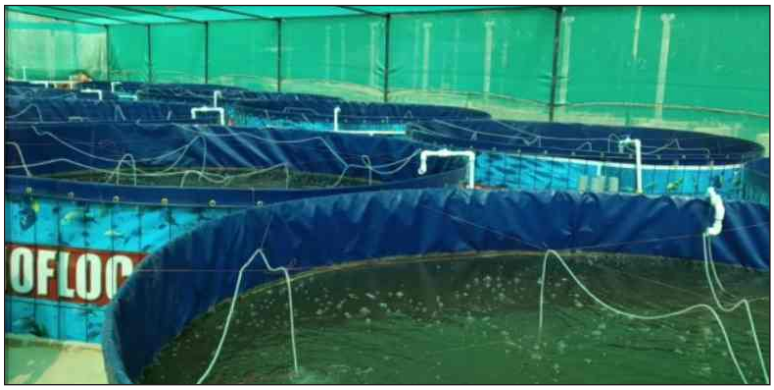
**Name of the technology** : **Development of commercial biofloc unit and biofloc based culture of common carp and Pangasius**

Demonstrated in : Vidyapatinagar Dalsing Sarai and Peedhouli, Tenghra

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/$m^3$

: 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 Teghra Begusarai, Bihar.



# 07 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 recieved **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 5$^{th}$ rNational 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 31$^{st}$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 Aadhadi 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

## Other Recognitions

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

## 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. Lavesh 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<br>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. r

Dr. Rama Sharma

Dr. Swadesh Prakash

Mr. S. S. Kamat r

Mrs. Poonam N. Behl r

Mr. R. R. Kadam

Mr. B.G. Mandhare r

## 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 | Best March Past<br>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 r | 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 |

# 08 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. r

## 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, Bhubaneshwar
- 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 r

## 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 Chardra Krishi Viswa Vidyalaya, Nadia, West Bengal
- Kalyani University, Kalyani, West Bengal
- Barkatullah University, Bhopal
- Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur
- Chhattisgarh Kamdhenu Vishwa Vidyalya, Chhattishgarh
- Babasaheb Bhimrao Ambedkar University, Lucknow
- Central of Agriculture University, Imphal
- Sri Venkateswara Veterinary University 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 Institue, 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 , Maharastra
- NGO Pradhan, Jumani, 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
- Shimpo Exports, Kolkata
- Coreline Exports, Kolkata
- Digha Sea Food Exports, Kolkata
- NSZA Sea Food Pvt. Ltd, Kolkata
- Central Calcutta Science and Culture Organization for Youth, Kolkata
- APC Nutrient, Mumbai
- Godrej Agrovet Pvt. Ltd., Vijayawada
- Maharashtra 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, Hoshangbad

## MoUs signed during 2018-19

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

### Indian Universities

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

### Governmental Institutions

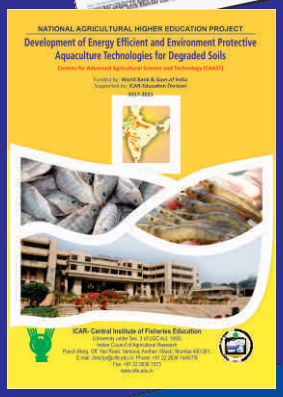
- Institute of Pesticides Formulation Technology, Department of Chemicals and Petrochemicals, Sector 20, Udyog Vihar, Gurugram, Haryana (25 January, 2019)

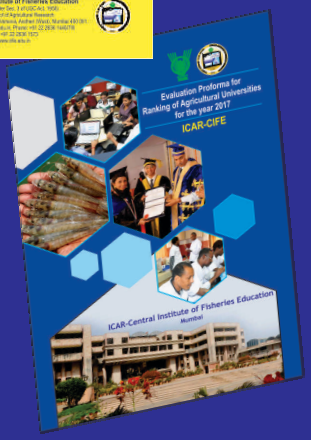
### Private Organizations

- Institute of Livelihood Research and Training, Hyderabad (06.04. 2018)

MoU signed with Institute of Livelihood Research and Training, Hyderabad r

# 09 Publications


**162** Publications

**43** Brochures

**40** Training Manuals

**11** Chapters in Books

**10** Bulletins/Booklets

**3** Reports

**1** Book

## 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* r (Sykes, 1839) using microsatellite markers. *Aquatic Living Resources* 32(4): 43-48.

Agarwal D, Gireesh-Babu P, Pavan-Kumar A, Koringa P, Joshi CG, Gora AH, Bhat I, Chaudhari A (2018) Molecular characterization and expression profiling of 17-beta-hydroxysteroid dehydrogenase 2 and spermatogenesis associated protein 2 genes in endangered catfish, *Clarias magur* r (Hamilton, 1822). *Animal Biotechnology* r *doi.org/10.1080/10495398.2018.1545* r *663*. r

Ahirwal SK, Jaiswar AK, Chakraborty SK (2018) Diet composition of oil sardine, *Sardinella longiceps* (Val. 1847) from Mumbai waters of Maharashtra, India. *Indian Journal of Geo-Marine Science* 47 (9): 1880-1887. r

Ahmad I, Dhanashree DJ, Balasinor NH, Rani B, Bhat IA, Chadha NK, Dube K, Saharan N (2018) Inhibin anti-peptide antibody macromolecule: An Approach to improve fecundity in *Clarias batrachus*. *International Journal of Biological Macromolecules* 120: 195-202.

Ahmad Z, Deo AD, Kumar S, Ranjan A, Aklakur MD, Sahu NP (2019) Effect of replacement of de-oiled rice bran with sweet potato leaf meal on growth performance, digestive enzyme activity and body composition of *Labeo rohita* (Hamilton, 1822). *Indian Journal of Fisheries* 66(1): 73-80.

Ahmed I, Bhat I, Jagtap A, Balasinor D, Kumar NS, Chanu TI, Rani B, Dar S, Leya T, Gora A, Saharan N (2018) Computational and biological approach for studying structure-function of inhibin chimeric peptide antibodies in *Clarias batrachus*. *Aquaculture* 501: 153-60.

Archana C, Saharan N, Rathore G, Srivastava PP, Rani B, Pandey PK (2018) Isolation and characterization of potential pendimethalin degrading bacteria from pesticides polluted soil. *Journal of Entomology and Zoology Studies* 6(4): 1842-1848. r

Ashutosh M, Chakraborty SK, Jaiswar AK, Sharma A (2018) Length-weight relationship of dominant fish species of two medium reservoirs of Uttarakhand, India. *Indian Journal of Fisheries* DOI 10.21077/ijf.2018.65.1.43179-16.

Ayyappan MV, Balange AK, Nayak BB, Kumar S (2018) Distribution of potentially pathogenic *Vibrio parahaemolyticus* in seafood and the aquatic environment of Mumbai, India. *Fishery Technology* 55 (3): 45-51. r

Basha KA, Joseph T, Lalitha KV, Prasad KP (2018) Nitrification potential of *Achromobacter xylosoxidans* isolated from freshwater finfish farms of Kerala, India. *International Journal of Current Microbiology and Applied Sciences* 7(8): 2645-2654. r

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Bharti VS, Inamdar AB, Purusothaman CS, Yadav VK (2018) Soft computing and statistical technique – application to eutrophication potential modelling of Mumbai coastal area. *Indian Journal of Geo-Marine Sciences* 42(02): 365-377. r

Bhat IA, Ahmad I, Nazir MI, Bhat RAH, Gireesh-Babu P, Goswami M, Sundaray JK, Sharma R (2018) Chitosan-eurycomanone nanoformulation acts on steroidogenesis pathway genes to increase the reproduction rate in fish. *Journal of Steroid Biochemistry and Molecular Biology* 185: 237-247.

Bhendekar SN, Mohamed KS, Shenoy L, Dineshbabu AP, Jayasankar J, Jaiswar AK, Singh VV, Chellappan A (2019) Spatial variability and abundance pattern of Indian squid off Maharashtra coast, India. *Journal of Marine Biology Association India* 60(2): 47-52. r

Bhuvaneswari GR, Purushothaman CS, Pandey PK, Gupta S, Kumar SH, Shukla SP (2018) Toxicological effects of chlorpyrifos on growth, chlorophyll a synthesis and enzyme activity of a Cyanobacterium *Spirulina* (Arthrospira)

*platensis*. *International Journal of Current Microbiology and Applied Sciences* 7(6): 2980-2990. r

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Chandran R, Tyagi LK, Jaiswar AK, Raizada S, Mandal S, Mayaker T, Bhist A, Singh SK (2018) Fisher's outlook and perception towards fishery resources of river Ib. *Journal of Community Mobilization and Sustainable Management* 13(1): 79-83.

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Chowdhury DK, Sardar P, Kumar S, Varghese T, Singha KP, Maiti MK (2019) Phospholipid: an essential nutrient for fish larvae. *Journal of Experimental Zoology, India* 22 (1): 1-5. r

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Daniel N, Pavan-Kumar A, Kathirvelpandian A, Praveenraj J, Damroy S, Chaudhari A (2019) First record of whitebarred goby *Amblygobius phalaena* (Valenciennes, 1837) from Indian waters. *Indian Journal of Fisheries* 65(3): 116-121. r

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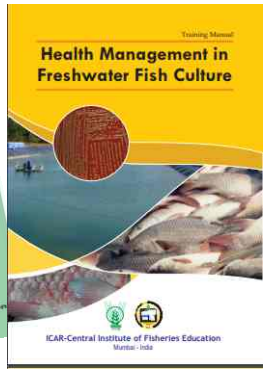

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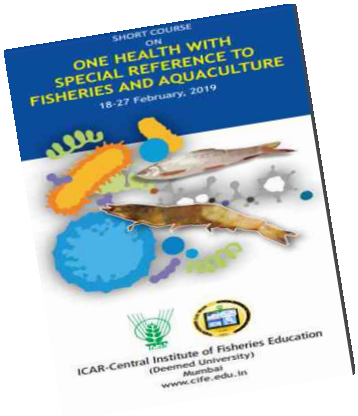


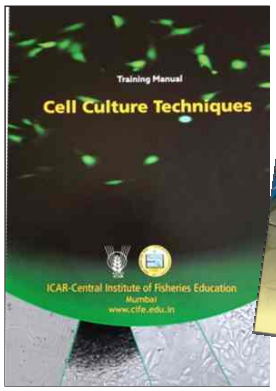



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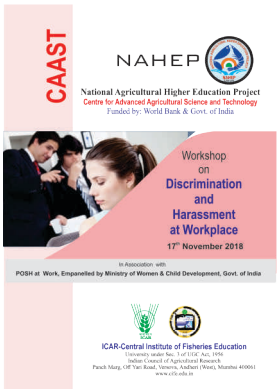


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अंतर्स्थलीय लवणीय प्रभावित क्षेत्रों (आईएसए) में झींगा (पी. वनामेंई) खेती की अर्थशास्त्र (2018) भा.कृ.अनु.प.- केन्द्रीय मात्स्यिकी शिक्षा संस्थान, मुंबई. पृष्ट- 2

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मूल्यवर्धित मत्स्य पदार्थ (2018) भा.कृ.अनु.प.- केन्द्रीय मात्स्यिकी शिक्षा संस्थान, मुंबई. पृष्ट- 1

नर्सरी तालाब का प्रबंधन (2018) भा.कृ.अनु.प.- केन्द्रीय मात्स्यिकी शिक्षा संस्थान, मुंबई पृष्ट- 4

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### 7.6.3. Telugu

*Clarias magur* (Marpu) *Chepalalo Janyu Paramina Abhirudhi* (2019) ICAR-Central Institute of Fisheries Education, Mumbai. 2pp. r

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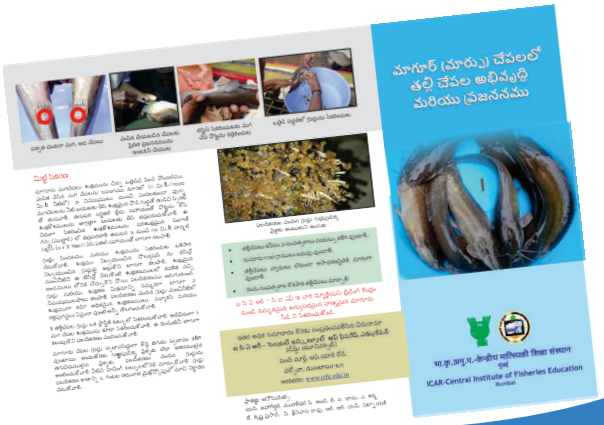
*Magur Chepala Jalajeeva Samvardhanam* r (2019) ICAR-Central Institute of Fisheries Education, Mumbai. 2 pp. r





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*Pukure chuner bybohar* (2018) ICAR-Central Institute of Fisheries Education, Mumbai. 4pp.

*Koi Macher Projonon O Bacha Utpadan Proyukti* (2018) ICAR-Central Institute of Fisheries Education, Mumbai. 6pp.

### 7.6.5. Marathi

COOL FISH-Solar Powered Cool Cabinet for Storage of Fresh Fish (2019) ICAR-Central Institute of Fisheries education, Mumbai. 2pp. r

## 7.7. Technical Bulletins/Extension Booklets

### 7.7.1. English

Composite Fish Culture (2018) ICAR-Central Institute of Fisheries Education, Mumbai. 19pp. r

Eco-friendly Feeding Strategies for Composite Fish Culture (2018) ICAR-Central Institute of Fisheries Education, Mumbai. 12pp. r

Farm-made Feed for Carp Culture (2018) ICAR-Central Institute of Fisheries Education, Mumbai. 11pp. r

Integrated Fish Farming (2018) ICAR-Central Institute of Fisheries Education, Mumbai 24pp.

Organic Freshwater Aquaculture Made Easy (2018) ICAR-Central Institute of Fisheries Education, Mumbai 24pp.

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जलकृषि हेतु आहार निर्माण एवं आहार प्रबंधन (2019) भा.कृ.अनु.प.–केन्द्रीय मात्स्यिकी शिक्षा संस्थान, मुंबई. पृष्ट- 19.

### 7.7.3. Marathi

Dube KD (2019) *Godyapanyati Moti Sanvardhan*. ICAR-Central Institute of Fisheries education, Mumbai. 17pp. r

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Sawant PB (2018) *Jalkrishi mein pragati ani adhuniktayein*. ICAR-Central Institute of Fisheries education, Mumbai. 21pp. r

## 7.8. Reports

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Sahu NP, Tripathi G, Sanath K, Kumar S, Xavier M, Poojary N, Bhoomaiah D (2018) ICAR-CIFE Annual report. ICAR-Central Institute of Fisheries Education, Mumbai. 181 pp.(*Hindi*) r

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Bedekar MK, Poojary N (2018) Annual Progess report of Strengthening and Development Grant to Agricultural Universities. ICAR-Central Institute of Fisheries Education, Mumbai. 41pp.

# 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 *Clarias magur*: 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., Rathi 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 | 3rd Interactive Meeting of Nodal Officers of SDAE | Port Blair, Andaman | 04-05 May, 2018 | ICAR-CIARI, Port Blair, Andaman r |
| G. H. Pailan | 23rd 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 25th 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 | 57th Annual Day | ICAR-CIFE, Mumbai r | 06 June, 2018 | ICAR-CIFE, Mumbai r |
| G. H. Pailan A. Biswas | 12th 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 | 24th 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 |

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| Paramita B. Sawant<br>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 |

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| 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 | 5th 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 |

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

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| 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 | 19th 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. | 3rd 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 |

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| 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 r 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 | 4th Agriculture Leadership Summit-2019 | Ganaur, Sonepat, 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, | 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 |

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| 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 | 105th Indian Science Congress | Manipur University, Manipur | 16 -20 March, 2019 | Indian Science Congress |
| Faculty of CIFE, Mumbai | 3rd 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 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 Malasia | 02 February, r 2019 r |
| Rajendran K.V. | 3rd 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/ rogrammes/ 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 |

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| 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 | 2nd Deans Meeting | ICAR-CIFE, Mumbai | 75 |
| 3. | 16 May, 2018 | 3rdInternational 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 | 57th Annual Day of ICAR-CIFE | ICAR-CIFE, Mumbai | 400 r |
| 6. | 21 June, 2018 | 4th 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 | 72nd 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 |




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

## 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. r

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, andother 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 (**T**ransparency, creating a **T**rouble free work environment and **T**imely 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. r

## 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). r

## 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 r 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. | 23rd 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 *In Silico* 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 |

# 12 Distinguished Visitors


CMFRI
CIFA
CIBA
NBFGR
NABARD
NFDB
3rd International Symposium on


Bharati Lavekar
Prakash Mehta


CMFRI
CIFA
NABARD
ISA


NAHEP
LAUNCH WORKSHOP
Development of Energy
Efficient and Environment
Protective Aquaculture
ICAR-CIFE,


INTENSIVE
FARMING

# 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 (WFU), 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, Sonepat, 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, Bhubaneshwar*
*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* r

**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*

# 13 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 Tand 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. r

## 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 Maharastra, 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 lettersof 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). r

## 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 releiving the stress in day to day life. After this, some sukshama vyayam like asana for neck, back and hands, taada asana, Vakra aasana, shashank aasan 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. r

## 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. "Swachchha 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 Bapu'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°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. r

## 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 sparklingly 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 wonthe Mr. Fresher and Ms. Fresher prizes, respectively. r


## 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 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 |

# 14 Personalia

# 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. Bhave

**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. Zendekar
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. Zendekar
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. Niranjan (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. Dhalongsaih 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. Satyanarayara | 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. Niranjan | SSS, Kakinada Centre | 31.08.2018 |
| 9 | Dr R. K. Upadhayay | 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 |

15

# 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 प्रज्ज्वलित 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 "यूनिकोर्ड 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 उन्हे 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 राजभा¬षा कार्यान्वयन समिति की 89 वीं, 90 वीं तथा 91 वीं तिमाही बैठक क्रमश: 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. एससी. ) 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.एचडी. 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 टेक्नोलॉजि चा स्वीकार - का मराठी अनुवाद ।
- इसी के साथ गॅरिअल मागुर का संवर्धन एवं उनका प्रबंधन - डा. अरूण शर्मा
- दक्षिण भारत में कैटफिश पालन - डा. महापात्रा

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 एसोशिएशन, 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 ह¬र्षोल्लास 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 गई ।

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