TRAINING CALENDAR

2019-20

ICAR- Central Institute of Brackishwater Aquaculture
(Indian Council of Agricultural Research)
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Brackishwater Aquaculture is a prospective sector in Indian Agricultural Economy, is a major export earner among the fisheries subsectors, to the tune of Rs. 30,000 crores during 2017-18. Farmed area under aquaculture had increased from 1.16 lakh ha and 1.4 lakh hectare from 2009-10 to 2017-18 whereas the productivity had increased from 1.17 tonnes/ha to 3.54 tonnes/ha in the same period with a total production nearing 7 lakh tonnes in 2017-18. Though unit value of shrimp has been fluctuating, the total quantum produced by one hectare of farm increased from 2010 to 2017 by 302.6%. Shrimp farming sector is the one where doubling of farmers income had been realistically achieved during 2010 to 2017. Production of shrimp species like white shrimp (*Penaeus vannamei*), milk fish (*Chanos chanos*), Asian Sea Bass (*Lates calcarifer*), and Pearl Spot (*Etroplus suratensis*;) would fetch higher income within a crop period of 3-4 months in case of shrimp, and 5-9 months in the case of finfish.

In the case of brackishwater resources suitable for aquaculture, do not compete with agriculture, drinking purposes and construction etc. In fact the coastal brackishwater resources have very limited alternate uses, other than aquaculture, hence if this resource effectively used for aquaculture in a sustainable mode, it will boost the livelihood and income of coastal rural poor and add to add the national income. Yet to be explored brackishwater resources of 1.2 million ha and inland saline areas of about 8 million ha are huge untapped potential to be utilized in India.

The Central Institute of Brackishwater Aquaculture (CIBA) under the Indian Council of Agricultural Research (ICAR) was established in 1987 with the following mandate:

- Basic, strategic and applied research for techno-economically viable and sustainable culture systems for finfish and shellfish in brackishwater.
- Species and systems diversification in brackishwater aquaculture.
- Act as repository of information on brackishwater fishery resources with a systematic database.
- Human Resource Development, capacity building and skill development through training, education and extension

The Headquarters of the Institute is located at Chennai and the experimental facilities, finfish and broodstock holding facilities, experimental hatcheries, pilot scale feed mill, etc., are at Muttukadu, about 35 km south of Chennai. The Institute has two Research Centres located at Kakdwip in South 24 Parganas District of West Bengal and at Navsari in Gujarat.

The research and development programmes in brackishwater aquaculture are carried out under the framework of the following five divisions:

- Crustacean Culture Division (CCD)
- Fish Culture Division (FCD)
- Nutrition, Genetics & Biotechnology Division (NGBD)

- Aquatic Animal Health & Environment Division (AAHED)
- Social Sciences Division (SSD)

The Institute has linkages and collaboration with other ICAR Fisheries Research Institutes and other Institutes under ICAR, State Agricultural Universities (SAUs), Fisheries, Agriculture, Horticulture and Animal Husbandry Departments of the State Governments/Union Territories, Brackishwater Fish Farmers Development Agencies (BFDAs) in various states, Department of Animal Husbandry, Dairying and Fisheries, the Coastal Aquaculture Authority, Ministry of Agriculture, Govt. of India, the National Fisheries Development Board, Ministry of Agriculture, Govt. of India, the Marine Products Export Development Authority (MPEDA), Mangrove and Marine Biodiversity Conservation Foundation of Maharashtra, Department of Biotechnology - NOFIMA, Norway, Govt. of India, Chennai Petro Chemicals Limited, M.S.Swaminathan Research Foundation, Chennai, Aquaculture Foundation of India, Chennai, FAO-Bay of Bengal Programme, Network of Aquaculture Centres in Asia-Pacific (NACA) and World Bank.

Training courses in brackishwater aquaculture are conducted throughout the year by the Institute as part of the extension services and offered to the State / Central government officials, faculty members and students of Fisheries Colleges and Agricultural Universities, farmers, entrepreneurs and other stakeholders engaged in brackishwater shellfish and finfish aquaculture activities. Brainstorming sessions, Interaction meetings, Farmers' meets, Demonstrations, Hands-on trainings, Workshops and Exhibitions are also conducted from time to time.

NOMINATION AND COURSE FEE

The application for the training (Annexure-I) in respect of each course must be accompanied by course fee in the form of a Demand Draft drawn in favour of "ICAR Unit, CIBA", payable at State Bank of India, Santhome Branch, Chennai-600028. The course fee can be also paid as cheque or cash/Credit/Debit Card at the time of reporting for the course. There is no course fee for ICAR employees. Applications should reach 15 days in advance for consideration. The employed candidates should apply through proper channel. The soft copy of the application can also be submitted through e-mail. The selected candidates will be intimated by post/e-mail and they should report on the first day of the commencement of the training course. Application along with the course fee is to be sent to (i) Director, ICAR- Central Institute of Brackishwater Aquaculture, 75, Santhome High Road, Raja Annamalai Puram, Chennai – 600 028 for the Courses conducted at Chennai and (ii) Officer-in-Charge, Kakdwip Research Centre of CIBA, 24 Paraganas (South), Kakdwip - 743 347, West Bengal, for the courses conducted at the KRC, Kakdwip Pincode 743 347 and iii) Officer-in-Charge, CIBA- Navsari Gujarat Research Centre, First Floor, Building of Polytechnic in Animal Husbandry, Navsari Agricultural

University, Navsari, Gujarat 396 450

TRAVEL

The expenditure on travel, TA, DA, etc., has to be borne by the sponsoring authority / Organization or by the candidates themselves

BOARDING AND LODGING

Since the Institute is having only limited hostel facilities, guidance would be provided to find suitable accommodation in hotels nearby the Institute. The transport facility will be provided from Chennai to Muttukadu Experimental Station whenever the training course is conducted at Mutukkadu Experimental Station of the Institute.

COORDINATION

The training courses will be coordinated by the concerned Head of the Division / Subject Matter Specialist. If any participant is unable to understand the matter in English, arrangements would be made to translate in Hindi, Bangla, Oriya, Telugu, Kannada, Malayalam and Tamil. On successful completion of the Training Courses, a Certificate on the same will be provided to each participant. If there is a demand for particular Training Course(s), it can be repeated as per the requirement.

Sl. No	Title of the Course	Place & Date	Duration in Days	Minimum Number of Participants	Course Fee Rs.	Division / Section / Centre to organize
01.	Brackishwater aquaculture practices	27 May – 1 June 2019 Navsari, Gujarat	6	10	4000	NGRC Navsari Gujarat
02.	Advance training on feed formulation and feed management in brackishwater aquaculture	10-15 June, 2019 Chennai	6	10	3000	Nutrition Section CIBA HQ
03.	Recent advances in Soil and Water Management in Brackishwater Aquaculture	24-29 June, 2019, Chennai	6	10	5000	Environment Section CIBA HQ
04.	Advances in Brackishwater Aquaculture Practices	01-06 July, 2019 at KRC, Kakdwip,	6	10	3000	KRC CIBA Kakdwip
05	Advances in finfish production technologies	01-06 July, 2019	5	10	3000	FCD CIBA HQ

06.	Hands-on training on Shrimp and Crab Breeding and Culture.	22-27 July 2019, Chennai	6	10	4000	CCD CIBA HQ
07.	Environmental and Climate Change Issues in Brackishwater Aquaculture	20-24 August – 2019, Chennai	5	10	4000	Environment Section CIBA HQ
08.	Seed Production and Culture of Brackishwater Finfishes.	29 July - 07 August 2019, Chennai	10	10	8000	FCD CIBA HQ
09.	Recent advances in Pacific white shrimp (*Penaeus vannamei*) and Indicus (*Penaeus*	23-27 August 2019, Chennai	5	10	5000	CCD CIBA HQ
10.	Scientific management practices for sustainable shrimp and crab culture	16-21 September 2019 at KRC, Kakdwip,	6	10	3000	CCD CIBA HQ
11.	Agri-Business Incubation Centres and Start-Ups	16-20 September, 2019, Chennai	5	10	3000	ITMU/ ABI CIBA HQ
12.	Issues in brackishwater farming and solutions for improvement of culture, management practices in Gujarat	24-28 September 2019, Navsari, Agricultural University, Gujarat	5	10	2000	NGRC Navsari Gujarat
13.	Better Management Practices in Shrimp *P.vannamei and P.indicus* Farming.	14-19 October 2019, Chennai	5	10	3000	CCD CIBA HQ
14.	Diagnosis and control of brackishwater finfish and shellfish diseases with special reference to emerging diseases	18-23 November, 2019 at KRC, Kakdwip, West Bengal	6	10	2000	FCD CIBA HQ
15.	Environmental and Climate Change Issues in Brackishwater Aquaculture Sustainability	25-30 November, 2019, Chennai	6	10	5900	Environment Section CIBA HQ
16.	Genetics & Biotechnology: Tools and their application in aquaculture.	02-07 December, 2019 Chennai	5	10	8000	Genetics Section CIBA HQ
17.	Tools for Aquatic Animal Disease Diagnosis and Management.	16-21 December 2019, Chennai	6	10	9000	Aquatic Animal Health CIBA HQ

18.	Technology transfer models for sustainable and profitable brackishwater aquaculture	28 January – 1st February 2020, Chennai	5	10	2500	SSD CIBA HQ
19.	Advanced Training in Aquaculture Nutrition and Feed Technology	10-19 February 2020, Chennai	10	10	8500	Nutrition Section CIBA HQ

Module 2: Skill Development on specific areas

The skill development training courses on specific areas will be arranged based on the requirement of the client. Those who are interested to join the following these customized skill development courses for a minimum period of 2 days (and maximum period as per the requirement) can contact and confirm the training dates. The course fee will be decided based on the details and requirements of the training seekers for individual programme and the fee for the same will be intimated in advance.

Sl. No.	Title of the Course	Course Components (The Course can be conducted for the combination of any of these components)	Minimum duration In days
1.	Seed production and culture of Asian seabass (*Lates calcarifer)*	a. Broodstock procurement, transportation techniques, acclimatization, quarantine b. Captive fish maintenance, maturation assessment, oocytes examination, selection of brood fishes for hormonal induction, c. Hormone preparation and administration techniques, d. Observation of spawning, egg collection, estimation of fertilization rate, incubation, hatching, larval rearing, e. Grading, fry production techniques, seed packing techniques, nursery rearing and grow out culture	3
2.	Nursery and grow out system for shrimp culture using Biofloc technology	a. Development of biofloc in static and RAS systems b. Nursery culture of post- larvae to juveniles with biofloc in tank based systems c. Grow out culture of shrimps with biofloc	5
3.	*Artemia* biomass culture using RAS	a. Development of axenic and mass algal culture b. Production of *Artemia* biomass using RAS	5

4.	Live feed culture techniques	a. Importance of live feed for fish larval production b. Production of live feeds c. Enrichment of live feeds d. Application of live feeds for fish larviculture	5
5.	Hands on training on Aqua feed analysis	a. Sampling of ingredients and feed for analysis b. Sample processing c. Preparation of standard solutions and reagents for proximate analysis d. Hands on training on estimation of proximate principles for moisture, crude protein, crude lipid, crude fibre and Total ash by conventional and modern methods	3
6.	Aqua feed production	a. Physical evaluation of feed ingredients b. Hands on training on grinding, sieving and mixing c. Feed production of wet pelletizer and Ring die pelletizer for production of sinking pelleted feeds d. Water stability of feeds e. Feed drying and packing f. Hands on training for production of extruded feeds g. Techniques for preparation of slow sinking and floating feeds h. Evaluation of extruded feeds	5
7.	Extrusion Feed Technology	a. Physical evaluation of feed ingredients b. Hands on training on grinding, sieving and mixing c. Hands on training for production of extruded feeds d. Techniques for preparation of floating, slow sinking and sinking nature e. Evaluation of extruded feeds	3
8.	Ring die pellet feed preparation	a. Physical evaluation of feed ingredients b. Hands on training on grinding, sieving and mixing c. Feed production of wet pelletizer and Ring die pelletizer for production of sinking pelleted feeds d. Water stability of feeds e. Feed drying and packing	3
9.	Advanced Analytical Techniques	a. Hands on training on analysis of fatty acid by GC b. Hands on training for amino acid analysis using HPLC c. Estimation of major and minor minerals in feed and ingredients d. Evaluation of Fish meal and Fish oil	5

10.	Feed Management	a. Feed requirement calculation b. Feeding chart for fish and shrimp c. Check tray monitoring d. Feeding methods and frequency e. Automatic feeders f. FCR	3
11.	Pond water and soil analysis and interpretation of results	a. Collection water and soil samples from aquaculture ponds b. Protocols for analysis of water and soil samples c. Interpretation of results d. Yard stick indicators for healthy pond bottom	3
12.	Pond soil and water BMPs for successful shrimp growth	a. Suitability of soil and water for shrimp aquaculture b. Optimum water and soil parameters for shrimp growth c. Management practices (BMPs) for the maintenance of water and soil parameters within the optimum levels d. Discharge water parameters and standards for environmentally sustainable aquaculture.	3
13.	Advanced analytical/instrumentation techniques for pond soil and water parameters	a. Important pond soil and water parameters and their optimum levels for brackishwater aquaculture b. Analytical techniques for the estimation of soil and water parameters c. Advanced instrumentation techniques for the estimation of parameters.	5
14.	Tools for Aquatic Animal Disease Diagnosis and Management	a. Overview of diseases in shrimp aquaculture b. Hepatopancreatic microsporidiosis, acute hepatopancreatic necrosis disease (AHPND), shrimp viral diseases c. Better management practices (BMPs) d. Biosecurity and Quarantine Measures e. Diseases surveillance in brackishwater aquaculture f.Probiotics and immunostimulants g.Requirements for Aquatic Animal Disease Diagnostic Laboratory h. Investigating disease in brackishwater aquaculture i. Bacteriological methods j. Molecular diagnostics k. Principles and practice of polymerase chain reaction l. PCR diagnosis of some important OIE listed viruses and bacterial pathogens of shrimp	6

15.	Aquatic Bacteriology	a. Overview of Aquatic Bacteriology b. Aquatic bacteriological methods c. Requirements for Bacteriology Laboratory d. Sampling, isolation and identification of bacteria	3
16.	Finfish and shellfish Parasitology	a. Overview of Parasitology b. Finfish and shellfish parasites in aquaculture c. Identification methods	3
17.	Aquaculture Pathology	a. Shrimp anatomy, dissection, tissue preservation; sampling, preservation / fixation and transport of samples for disease investigation b. Histological techniques: fixing, embedding, sectioning and staining c. Describing pathology	3
18.	Molecular Diagnostics of shellfish and finfish Diseases	a. Principles and practice of polymerase chain reaction (PCR) and reverse transcriptase PCR (rt-PCR) b. Diagnosis of two finfish viruses and three shrimp viruses by PCR	3
19.	Polymerase chain reaction (PCR) for diagnosis of shrimp diseases	a. Principles and practice of polymerase chain reaction (PCR) b. Diagnosis of shrimp viruses by PCR	3
20.	Molecular Diagnostics of finfish diseases	a. Principles and practice of reverse transcriptase PCR (rt-PCR) b. Diagnosis of two finfish viruses viruses by RT-PCR	3
21.	Preparation of Bankable projects for obtaining bank loans/subsidies	a. Project report and its components b. Preparation of draft project report c. Vetting/Appraisal by present/retired officials from commercial banks/MPEDA/NFDB	5
22.	Approaches and methodologies for brackishwater aquaculture extension	a. System specific extension approaches with frameworks b. Socio-economic evaluation of aquaculture systems - templates c. Pragmatic methodologies for aquaculture extension and training	5
23.	Climate change and aquaculture	a. Important weather parameters and their direct and indirect impacts (positive and negative) on brackishwater aquaculture b. Impact of extreme climatic events on aquaculture c. Mitigation and adaptation measures for combating the impacts of climate change d. Contribution of aquaculture to global warming potential (Greenhouse gases) e. Life cycle analysis for environmental sustainability and carbon friendly aquaculture.	5

24.	Integrated programme on biological and Analytical techniques (suitable for student community)	a. Biological techniques, breeding, larviculture, nursery and grow out culture of shrimps, fishes and crabs. b. Feed processing technology for different fish and shrimp species. c. Disease diagnostics including pathology, microbiology, virology and parasitology. d. Genetics, bioinformatics and biotechnology techniques for aquaculture. e. Soil and water quality analyses and recommendations. f. Socio-economic assessment of technologies and programmes.	30 days* *(Fees based on the nature of training and requirements of the trainees)*

Skill Development programmes on specific areas at
Kakdwip Research Centre of CIBA, Kakdwip, West Bengal

25.	Breeding and seed production of brackishwater catfish *Mystus gulio*	a. Broodstock development. b. Maturation assessment and induced breeding. c. Spawning and larval rearing. d. Nursery rearing.	5
26.	Mud crab farming	a. Grow-out and fattening of mud crab, Pre-stocking management, Pond preparation, crab fencing, liming and fertilization, stocking density, grading, feeding management, soil and water quality management	3
27.	Farm made aqua feed preparation	a. Physical evaluation and selection of feed ingredients b. Hands-on training on grinding, sieving and mixing c. Feed formulation techniques d. Hands-on training for feed production through pelletizer e. Water stability of feeds f. Feed drying and packing	3
28.	Nutrient enrichment of feed ingredients through solid state fermentation (SSF)	a. Importance of solid state fermentation b. Introduction about the organisms used for solid state fermentation c. Techniques of solid state fermentation d. Hands on training for nutrient enrichment of ingredients through SSF e. Proximate analysis of ingredients before and after enrichment	5

29.	Disease Management in Brackishwater Aquaculture with special reference to *Penaeus vannamei* farming.	a. Management of exotic and emerging diseases in shrimp farming in the wake of introduction of *Penaeus vannamei* farming in India. b. Currently prevailing diseases of *P. vannamei* in India with their control measures. c. Acute hepatopancreatic necrosis disease (AHPND): Current scenario and future perspectives. d. Biosecurity and quarantine measures with special reference to *P. vannamei* farming in India. e. Sampling tools of shrimp for bacteriological and histopathological examination. f. Rapid diagnosis of shrimp diseases through molecular tools. g. Role of probiotics and immunostimulants in prevention of diseases in vannamei farming.	5
30.	Scope of brackishwater fish and shrimp farming (In vernacular language, Bengali)	a. Brackishwater farm design and construction b. Important cultivable species and their culture c. *Penaeus vannamei* and *Penaeus indicus* culture d. Polyculture of tiger shrimp and fish, IMTA, culture of crab. e. Livelihood opportunity with ornamental fish, pearlspot and scat f. Marketing of farm produce	5

Skill Development programmes on specific areas at
Navsari Gujarat Research Centre of CIBA, Navsari, Gujarat

31.	Disease Management in Brackishwater Aquaculture with special reference to *Penaeus vannamei* farming.	a. Management of exotic and emerging diseases in shrimp farming in the wake of introduction of *Penaeus vannamei* farming in India. b. Currently prevailing diseases of P. vannamei in India with their control measures. c. Acute hepatopancreatic necrosis disease (AHPND): Current scenario and future perspectives. d. Biosecurity and quarantine measures with special	5
32.	Scope of brackishwater fish and shrimp farming (In vernacular language, Gujarati)	a. Brackishwater farm design and construction b. Important cultivable species and their culture c. *Penaeus vannamei* and Penaeus indicus culture d. Polyculture of tiger shrimp and fish, IMTA, culture of crab. e. Livelihood opportunity with ornamental fish, pearlspot and scat f. Marketing of farm produce	5

Module-3: SKILL DEVELOPMENT TRAINING PROGRAMME – Long Term

(course fee will be decided based on the aspects covered and the duration of the programme and will be intimated in advance)*

Need based Training programmes of 3 – 8 weeks can also be conducted. This type of training programme would be comprehensive on the brackishwater aquaculture and the course content would cover shrimp and mud crab farming and seed production; finfish farming and seed

production; aquaculture nutrition; aquatic environment and animal health management; genetics and biotechnology; aquaculture extension, economics and entrepreneurship development.

Services offered by ICAR-CIBA

TRANSFER OF TECHNOLOGY & CONSULTANCY SERVICES

- Soil and water quality management in shrimp farming/brackishwater aquaculture
- Environmental impact assessment of aquaculture projects and carrying capacity estimation of water bodies
- Shrimp hatchery technology and management (Species: Pacific White Shrimp (*P.vannamei)*, Tiger shrimp (*P.monodon)*, Indian white shrimp (*P.indicus)*, Kuruma shrimp (*P. japonicus) and* Banana shrimp (*P.merguiensis).*
- Shrimp farming technology
- Mud crab breeding larval development and culture
- Finfish breeding and culture (species: Asian seabass (*Lates calcarifer)*, Grey Mullet (*Mugil cephalus*), Milkfish (*Chanos chanos*), Pearlspot (*Etroplus suratensis*) and brackishwater catfish **(***Mystus gulio*).
- Shrimp/crab / fish nutrition & feed technology, biofloc technology
- Shrimp / crab/ fish disease diagnosis and health management including pathology, microbiology, virology and parasitology.
- Aquatic animal quarantine and biosecurity
- Shrimp/ crab/ fish genetics, genomics, biotechnology and bioinformatics
- Knowledge partnership and partnership farming with stakeholders for the technologies developed, validated and ready for technology transfer through the Institute Technology Management Unit.
- HACCP

ANALYTICAL SERVICES

- Analyses of water and soil quality parameters
- Analyses of shrimp / fish feed and their ingredients
- Microbiological and pathological analyses of shrimp / fish tissue samples.
- Genetics, Genomics & bioinformatics

For further details, please write to:

The Director
ICAR-Central Institute of Brackishwater Aquaculture
75, Santhome High Road, Raja Annamalaipuram,
Chennai-600 028 Tamil Nadu

Published by : **Dr. K.K.Vijayan**
Director

Annexure - I

APPLICATION FOR TRAINING COURSE

1. Title of the Training Course :

2. Name of the Candidate :
(in capital letters)

3. Educational Qualification :

4. Occupation/Designation :

5. Postal address, E-mail I.D.
and Mobile no. :

6. Date of Birth/ Nationality/Sex :

7. Whether SC/ ST
(if 'yes', attach proof certificate) :

8. Nature of Training required in
Brackishwater Aquaculture :

9. Particulars of course fee/
DD enclosed :

10. Are you being sponsored?
If 'yes', give name and
address of the Organisation :

(Recommendation of sponsoring
authority with signature and office
seal)

Date:
Place:

Signature of the
Applicant

ICAR-Central Institute of Brackishwater Aquaculture

Headquarters

Director
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Muttukadu Experimental Station

Officer-in-Charge
Muttukadu Experimental Station of ICAR-CIBA
Kovalam Post
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Tamil Nadu
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Kakdwip Research Centre

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Navsari Gujarat Research Centre

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