



Regional Capacity Building Programme
on
**Biotechnological Tools in
Aquatic Genetic Resource Management and
Ex Situ Conservation**

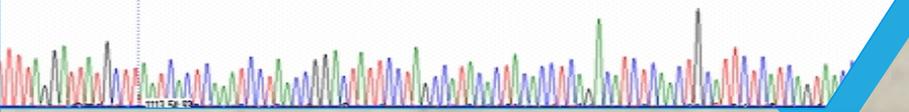


December 7-18, 2020

Organized by
Indian Council of Agricultural Research (ICAR)
Asia-Pacific Association of Agricultural Research Institutions (APAARI)
Asia-Pacific Consortium on Agricultural Biotechnology and Bioresources (APCoAB)

Training Institute
ICAR-National Bureau of Fish Genetic Resources (NBFGR)
Canal Ring Road, PO Dilkusha, Lucknow -226002, Uttar Pradesh, India

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Genetic erosion through inbreeding in farmed stocks is an immediate concern, as it adversely affects performance of the seed, the most critical input for aquaculture. The mitigation strategies require expertise of biotechnological tools and *ex situ* conservation technologies, such as live germplasm resource centres with certified broodstock of known origin and cryofrozen sperm/cells.



Since 1970, aquaculture is growing at a fast pace of over 6% globally. At present, it contributes nearly 50% of global fish production and is expected to support the additional demand of 40 million tons by 2030. Asia contributes about 90% of global production and also has enormous potential. The above perspective holds immense significance for Asia for the two important reasons. Firstly, these nations are endowed with diverse genetic resources, adapted to diverse climatic regimes. South and Southeast Asia has four mega biodiversity hotspots with 50-60% endemism. While this genetic diversity, between and within species, is an opportunity for diversification and productivity improvement, and knowledge generation and conservation of genetic diversity are some of the challenges. Secondly, the lack of scientific capacity available with many countries in the various research areas of AqGR management is a serious bottleneck for planning conservation and sustainable aquaculture. Therefore, the nations need to strengthen the research capacity on various dimensions of AqGR management including deployment of biotechnological and *ex situ* conservation tools.

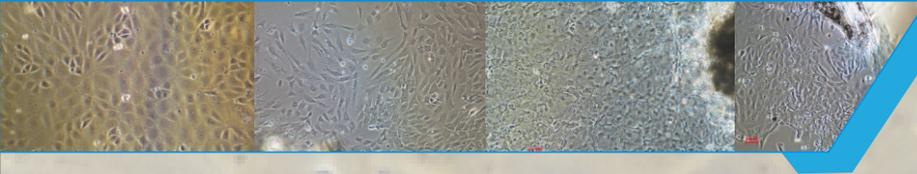
Genesis

The concept of this capacity building programme is inspired from recommendations of the “Regional Workshop on Fish and Marine Genetic Resources and its Amelioration” held during July 10-12, 2019, organized by APAARI in collaboration with Sri Lanka Council of Agricultural Research and Policy (SLCARP) and National Aquatic Resources Agency (NARA) in Sri Lanka, whereby it was expected by the participating countries to organize similar capacity building programmes at regional level.

Purpose

This programme aims to utilize the specialized experience of ICAR-NBFG scientists to develop comprehensive training course, on AqGR management. It envisages to develop nucleus of technical expertise within the participating countries, which will conduct research programmes and also help to establish linkages and partnerships with researchers from participating nations to develop and implement the collaborative programmes in future.





Objectives

1. To create awareness among country participants on AqGR management and associated global frameworks such as CBD, GTI and CGRFA etc.
2. To build capacity for utilization of molecular tools in genetic diversity analysis and their applications in AqGR management.
3. To enhance capacity and capability for *ex situ* conservation tools.

Principal components of the programme

The course will have a mix of lectures and online demonstrations of lab techniques. The total duration of the course will be 12 days, with 10 working days.

Concept building

- i. About AqGR, importance of AqGR in production system and livelihood security: overview of global initiatives.
- ii. Concepts and tools in genetic diversity analysis
- iii. Aquaculture genetics, selective breeding, inbreeding and broodstock management
- iv. *Ex situ* conservation tools; Sperm cryopreservation, cell culture and applications
- v. Diseases and genetic resource management

Online demonstration modules

- i. Molecular tools in characterization and genetic diversity research. This module will involve methodologies including nucleic acid extraction, quality check, primer designing, PCR and sequencing including Sanger's and NGS, with the following perspectives:
 - a. Molecular marker development
 - b. Species discrimination with molecular markers and complimenting conventional taxonomy
 - c. Polymorphism in molecular markers (nuclear/mtDNA) and population genetics
 - d. Statistical methods in molecular marker data analysis
 - e. Analysis of genetic variability and diversity
- ii. *Ex situ* conservation tools
 - a. Sperm cryopreservation: freezing, thawing and fertilization
 - b. Cell culture: development, characterization and preservation
- iii. Diagnostic tools
 - a. Molecular Detection of pathogen using molecular techniques
 - b. Virus isolation using cell lines

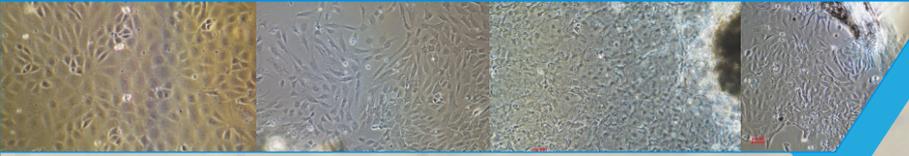


Organization and participation

Organizers: Indian Council of Agricultural Research (ICAR), New Delhi, India; Asia-Pacific Association of Agricultural Research Institutions (APAARI); Asia-Pacific Consortium on Agricultural Biotechnology and Bioresources (APCoAB), Bangkok, Thailand

Training Institute: ICAR-National Bureau of Fish Genetic Resources, Lucknow, Uttar Pradesh, India

Dates: December 7 - 18, 2020



Participants: Participants will be selected through open circulation and nominations from APAARI member countries. In addition, 10 candidates from Indian institutes will be accepted.

Experts and Resource Persons

The resource persons and faculty will be:

1. The researchers from ICAR-NBFGR, Lucknow, India
2. Invited from other Indian organizations
3. International subject matter experts, officials from FAO or other international agencies

Coordination of the programme

The international programme will be coordinated by

Patron:

Dr. Trilochan Mohapatra
Secretary (DARE) & Director General (ICAR), India

International Coordination:

Dr. J K Jena
Deputy Director General (Fisheries Science), ICAR, India
Dr. Rishi Tyagi
Coordinator, APCoAB, APAARI, Thailand

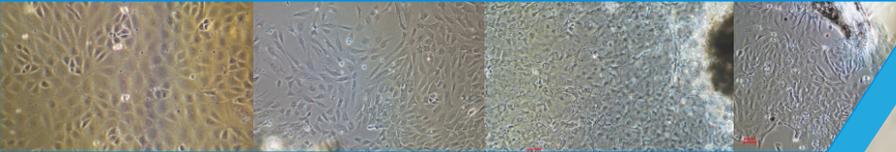
Course Director:

Dr. Kuldeep K Lal
Director, ICAR-NBFGR, India

Course Coordinators:

Dr. Vindhya Mohindra
Principal Scientist & HoD Fish Conservation, ICAR-NBFGR, India
Dr. Neeraj Sood
Principal Scientist, ICAR-NBFGR, India
Dr. Rajeev K Singh
Principal Scientist, ICAR-NBFGR, India





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APPLICATION FORM

Title (Dr/Mr/Ms/Mrs) _____ Gender (Male/Female) _____

First Name _____

Middle Name _____

Family Name _____

Designation/Job title _____

Organization _____

(with address) _____

City _____

State/Province _____

Postal/Zip Code _____

Country _____

Nationality _____

Date of Birth (dd/mm/yy) _____ Age(in years) _____

Address _____

(as in passport) _____

City _____

State/Province _____

Postal/Zip Code _____

Country _____

Passport Number _____

Date of Issue of Passport _____

Date of Expiry of Passport _____

Email **Primary:** _____

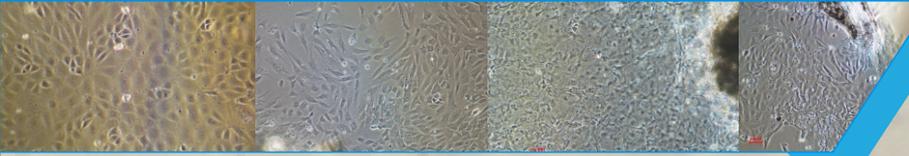
Alternate: _____

Mobile No. _____

Phone No. _____

Educational Qualifications (B.Sc./M.Sc./PhD/any other)

Degree	Year	Subject(s)	University/Institute



How did you come to know about the training? (Restrict to 100 words)

Describe your duty and job description (Restrict to 300 words)

How will this training help you? (Restrict to 300 words)

Full Name of Applicant _____

Date _____

Signature _____

Remarks and Recommendations of the candidate's nominating organization. Please state clearly technical strength of the applicant and how this training will be useful for your organization/country

Date _____

Signature _____

Place _____

Name of Forwarding Authority _____

Seal _____