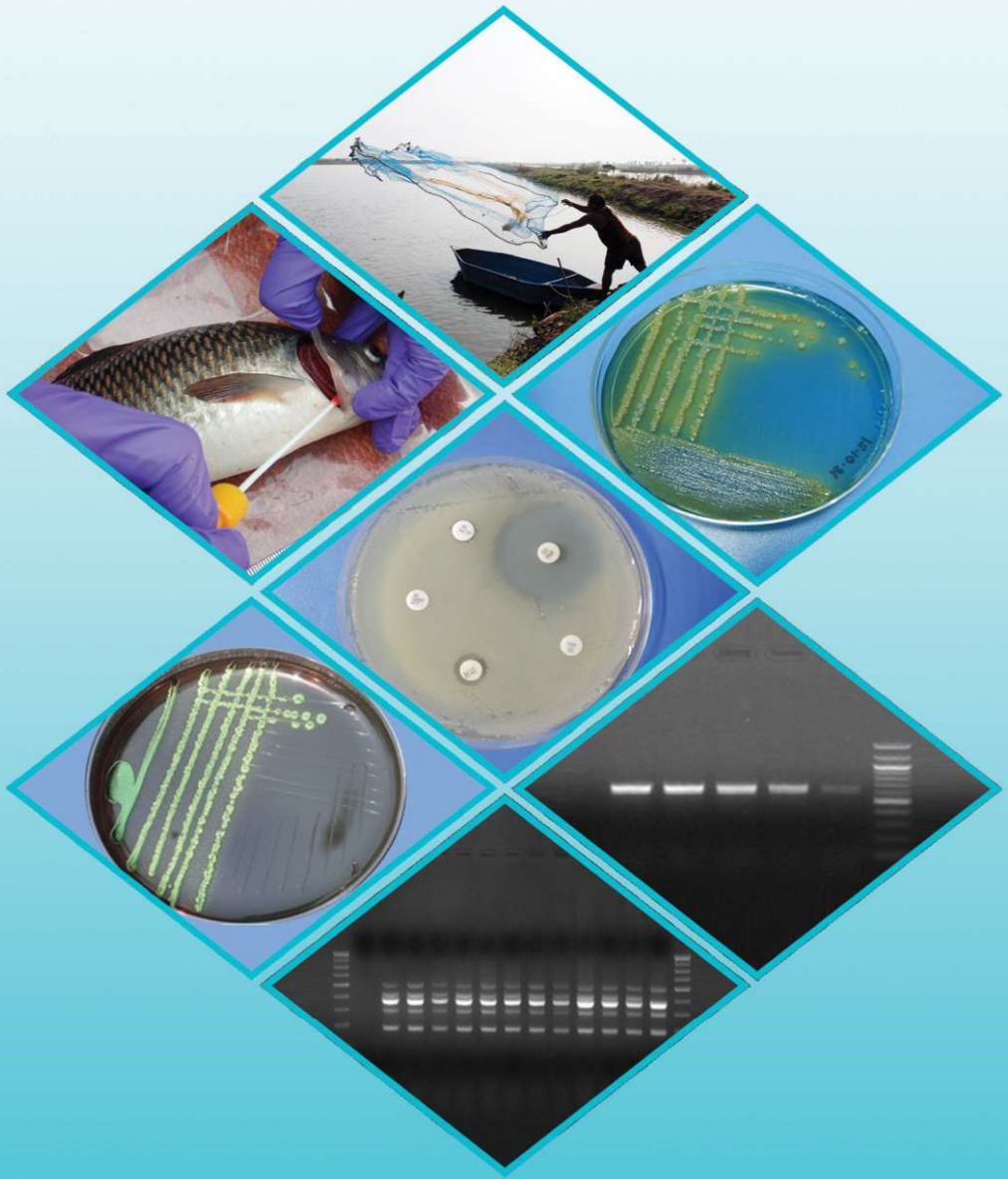
TRAINING MANUAL

Virtual Training Programme on "Phenotypic and Molecular methods for detection of Antimicrobial Resistance (AMR)" under FAO-TCP/RAS/3702

17th- 19th March, 2021



Jointly Organized by

ICAR-National Bureau of Fish Genetic Resources, Lucknow

&

ICAR-Central Institute of Fisheries Technology, Kochi

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ICAR-National Bureau of Fish Genetic Resources (ICAR-NBFGR)

The ICAR-National Bureau of Fish Genetic Resources (ICAR-NBFGR), Lucknow, established in 1983, has been recognised as a centre of excellence in conserving aquatic bioresources of India. The mandate of the institute includes collection, classification and cataloguing of fish genetic resources of the country, maintenance and preservation of fish genetic material for conservation of endangered fish species and evaluation and valuation of indigenous and exotic fish species. Since last three decades, the ICAR-NBFGR has been promoting works on database development, genotyping, registration of aquatic germplasm, gene banking and evaluation of threatened and exotic fish species. The Bureau has been identified as a nodal institute for development and maintenance of fish cell lines under NRFC. The Bureau also has modern and state-of-art facilities for genotyping, DNA barcoding, NGS, genomic and proteomic research, gene banking, tissue and cell culture repository and high performance computing. ICAR-NBFGR is the nodal centre for Fisheries Component of Indian Network for Fisheries and Animal Antimicrobial Resistance (INFAAR) and coordinating the surveillance of Antimicrobial resistance (AMR) in farmed fish and shrimps throughout the country in collaboration with all eight ICAR-Fisheries Institutes.

ICAR-Central Institute of Fisheries Technology (ICAR-CIFT)

ICAR-Central Institute of Fisheries Technology (ICAR-CIFT), set up in 1957 in Kochi, Kerala, is the only national centre in the country where research in all disciplines relating to fishing and fish processing is undertaken. Research centres of the institute function at Veraval (Gujarat), Mumbai (Maharashtra) and Visakhapatnam (Andhra Pradesh). ICAR-CIFT is an ISO/IEC 17025:2005 certified, NABL accredited, FSSAI National reference laboratory for fish and fish products in India. The institute has developed resilient fishing systems, green energy technologies in fish harvest and post-harvest sectors, appropriate technologies for complete utilization of fishery resources as value added and by-products. The institute actively researches on bioprospecting of aquatic resources and molecular diagnostics for food borne pathogens and fish pathogens. The institute is a member of the INFAAR network and is actively pursuing research on antimicrobial resistance in farmed finfish and shellfish and employing bacteriophages as natural antimicrobials to combat antimicrobial resistance. ICAR-CIFT has actively participated in the Proficiency Test on Antimicrobial Susceptibility Test (PTAST 2020) conducted by Faculty of Veterinary Science, Chulalongkorn University (CUVET), Bangkok with the support of the FAO. The institute regularly conducts training and awareness programmes on responsible fishing, sustainable fishing, value added fish products and food safety. ICAR-CIFT was awarded the prestigious Sardar Patel Best Institute Award in 2000, 2006 and 2018.

About the FAO-TCP

The Food and Agriculture Organization of the United Nations (FAO) and the Indian Council of Agricultural Research (ICAR) are collaborating on a multi-country Technical cooperation programme (TCP) entitled 'Support mitigation of Antimicrobial Resistance (AMR) risk associated with aquaculture in Asia'. The project contemplates to devise effective mitigation of AMR risk from the production of key aquaculture commodities in three participating countries namely Vietnam, Indonesia and India. In India, the TCP is being implemented by ICAR-National Bureau of Fish Genetic Resources (ICAR-NBFGR) as the lead institute and ICAR-Central Institute of Fisheries Technology (ICAR-CIFT) as the partner institute.

The FAO-TCP aims to deliver following outputs:

- **Output 1:** Baseline information on use and governance of antimicrobial in culture of Indian major carps and pangasius is generated and awareness to AMR risks associated with aquaculture is enhanced among the different stakeholders
- **Output 2**: National laboratory capacity for effective surveillance and monitoring of AMR associated with aquaculture is enhanced
- **Output 3**: Good animal health management practices for 2 key aquaculture commodities in the participating countries are developed.
- **Output 4**: Legislative framework for effective governance of antimicrobial use (AMU) in aquaculture and National strategy and action plan and effective mitigating, surveillance and monitoring of AMR risk associated with aquaculture are developed

Course Background

Antimicrobial resistance (AMR) is the ability of microorganisms to resist the effects of antimicrobials. AMR is a global threat to health, livelihoods and the achievement of the Sustainable Development Goals (SDG). World Health Organization has called AMR as one of the most important public health threats of the 21st century. The main drivers of AMR are inappropriate and excessive use of antimicrobials in both human healthcare and animal sector including aquaculture. Antimicrobials are used in production practices to manage animal/fish diseases. In recent decades, the intensification of animal production due to the increasing demand for animal proteins has led to increase in the use of antimicrobials. AMR makes disease treatments ineffective, increases severity of the disease, reduces productivity and leads to economic losses. Surveillance of AMR is identified as priority in the National Action Plan to mitigate the impacts of AMR across the sectors. For this, standardized laboratory techniques on detection of AMR are the need of the hour. The proposed training programme will provide theoretical and practical information on internationally accepted detection methods.

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