

ICAR-NACA School on Aquatic Animal Epidemiology and Disease Surveillance

Background

Sustainable growth of Asian aquaculture is important for livelihood and nutritional security in the region and at the same time for global availability of fish, a health food for every strata of human society starting from resource poor to rich. Currently, about 90 percent of the global aquaculture production is contributed by Asia and the sector is growing annually at the rate of approximately 9 percent. However, disease outbreaks are recognized as a major constraint to the sustainable growth of aquaculture. Diseases are usually the end result of complex interactions involving environmental factors, immunity of the host, presence of infectious agents and poor management practices. To have a thorough understanding of the risk factors involved in disease outbreaks, it is essential to follow aquatic system approach rather than pathogen-focused approach applied traditionally, Aquatic system approach is possible only through epidemiological studies where the major emphasis is given to determine quickly whether the disease is infectious or not and if infectious, then prevent transmission and spread. In addition, the epidemiological approach can provide a more comprehensive and structured insight into understanding of a disease process. This process can be bidirectional i.e. downward (from population to individual to organ to tissue to cell and to molecule) and upward (from population to farm to district to state to country). Therefore, epidemiology can help in identification of risk factors responsible for disease outbreaks at different levels i.e farm, zone or country so that intervention strategies can be developed to minimise or eliminate such risk factors and reduce the risk of disease outbreaks at all levels. Moreover, identifying and weighing the relative risks associated with different risk factors can help to better target resources at the major risks, so that intervention strategies become more cost-effective. It is important to mention that epidemiology is not properly utilized by aquatic animal health experts, primarily due to lack of expertise. Better understanding of this subject can help in identification of the risk factors and better management of infectious diseases in aquaculture.

Early detection is considered to be another key to the control of diseases and this can only be achieved through a structured surveillance programme. Considering the necessity of

such a programme in India and to comply with international SPS regime, a National Surveillance Programme for Aquatic Animal Diseases (NSPAAD) is being implemented since 2013 in India. The programme has been successful in strengthening the passive surveillance system in the country and detecting several new/emerging pathogens for the first time from the India which include; Cyprinid herpesvirus-2, Carp edema virus, *Enterocytozoon hepatopenaei*, Infectious myonecrosis virus, *Candidatus Actinochlamydia pangasiae* and Tilapia Lake Virus. The programme also has been successful in developing an system for first time confirmation of any new disease and sending early warning/alert to the stakeholders; and in improving the reporting obligations of the country to international organizations like NACA and OIE.

Specific objective of the proposed school

The main objective of the school will be to develop capacity in the field of aquatic animal epidemiology and disease surveillance of the aquatic animal health experts working in India and NACA member countries. The proposed school will mainly focus on epidemiology; sharing the experiences/lessons learnt in the surveillance programme and experiences of other Asian countries.

Major topics to be covered in the proposed school

- ✓ Concept and principles of epidemiology
- ✓ Use of epidemiological principles in design and implementation of surveillance
- ✓ Sampling considerations for surveillance
- ✓ Population survey
- ✓ Assessing disease prevalence
- ✓ Estimation of sensitivity and specificity of diagnostic test
- ✓ Predictive value of a test
- ✓ Investigation of disease outbreak
- ✓ Identification of risk factors
- ✓ Questionnaire design

Target participants

Aquatic animal health experts from India and NACA member countries can attend the proposed school on Aquatic Animal Epidemiology and Disease Surveillance.

Venue: ICAR-National Bureau of Fish Genetic Resources, Lucknow

Dates: March 1 to 6, 2019

Expected Participants: 20

Funding Support

- **For Participants from Abroad:** Travel expenses will be borne by the sponsoring countries. Local hospitality and logistics will be met from India-NACA fund.
- **For Participants from India:** Travel expenses will be borne by the respective sponsoring organizations. Local hospitality and logistics will be met from NSPAAD funded by Department of Animal Husbandry, Dairying and Fisheries, Government of India through NFDB, Hyderabad, India.
- **For Invited Experts:** All expenses will be met from NSPAAD funded by Department of Animal Husbandry, Dairying and Fisheries, Government of India through NFDB, Hyderabad, India.

Organizers

Indian Council of Agricultural Research (ICAR), New Delhi, India and Network of Aquaculture Centers in Asia-Pacific (NACA), Bangkok, Thailand. The organizers may seek collaborations with other organization, Government or Non-government for sponsoring the event. NACA will play an important role in nominating the experts/participants working area on aquatic animal health from different member countries of NACA.

Synergy among the organizers

The organizations, ICAR and NACA brings in complementary scientific strength and range of expertise of several disciplines including, Aquatic Animal health, Social science, and gender studies, Aquaculture, Genetics and Biotechnology. ICAR is lead organization in India addressing the research and education need in the field of agriculture science including livestock and fisheries. ICAR has dedicated institutes, called National Bureaus for research on genetic resource management. ICAR-NBFGR, is part of Indian Council of Agricultural Research working for Aquatic Genetic Resource Management in India. In addition, Institute also has a division on Fish Health Management with multidisciplinary expertise available such microbiology, pathology, immunology, biotechnology, disease surveillance, etc. ICAR-NBFGR is the Nodal Centre for implementation of National Surveillance Programme for Aquatic Animal Diseases (NSPAAD) in India. NSPAAD is being implemented in 20 states of India through active collaboration of 29 partners.

NACA is an inter-governmental organization with 19 members from Asia-Pacific and India is one of the founding members. NACA also has other regional networks like SPC - Secretariat of the Pacific Community, FAO on board. NACA has implemented several projects on aquatic animal health. NACA is involved in Quarterly Aquatic Animal Diseases (QAAD) reporting from Asia-Pacific region to OIE. NACA implemented a widely acclaimed program on Best management Practices for shrimp farming through cluster approach with funding from Government of India. NASPAD programme was highlighted in the QAAD report (Oct-Dec, 2016) of NACA/OIE. NACA was also involved in formulation of NSPAAD in India.

The two organizations bring together capacity of science, knowledge and implementation expertise across the countries.

Conduct of the School

Programme Convener:

- Prof. K. L. Morgan, Ex-Chair of Epidemiology, University of Liverpool, United Kingdom

Programme Co-conveners:

- Dr. Neeraj Sood, Dr. P.K. Pradhan & Dr. Gaurav Rathore, ICAR-NBFGR, Lucknow

Invited speakers:

- Prof. K. L. Morgan, Ex-Chair of Epidemiology, University of Liverpool, United Kingdom
- Dr. Eduardo Leano, Co-ordinator, Aquatic Animal Health Programme, NACA
- Dr. Iddya Karunasagar, Former Senior Fisheries Officer, FAO

Programme Coordination:

- ICAR-Dr. J.K. Jena, Deputy Director General (Fy. Sc.), ICAR, New Delhi
- NACA-Dr. Cherdasak Virapat, Director General, NACA, Thailand
- ICAR-NBFGR- Dr. Kuldeep K. Lal, Director, ICAR-NBFGR, Lucknow