



National Surveillance Programme for Aquatic Animal Diseases: Establishment of e-governance in Aquatic Animal Disease Management System

Funding under

Pradhan Mantri Matsya Sampada Yojana (PMMSY)

By

Department of Fisheries

Ministry of Fisheries, Animal Husbandry and Dairying

Government of India

Coordinating Institute

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



Team

Dr. J.K. Jena, Deputy Director General (Fy.Sc.), ICAR, New Delhi and Coordinator, NSPAAD

Dr. Uttam Kumar Sarkar, Director, ICAR-NBFGR, Lucknow and Co-coordinator, NSPAAD

Dr. Neeraj Sood, Principal Scientist & CPI, NSPAAD

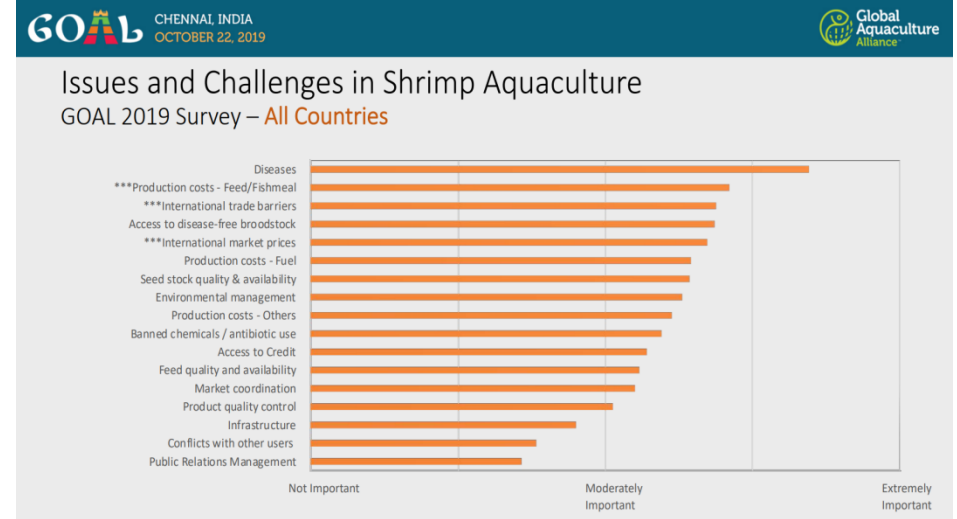
Dr. P.K. Pradhan, Principal Scientist & Head

Why Disease Surveillance!

India ranks 2nd in fish and aquaculture production globally
Annual growth rate in 2021-22- 10.34%

Diseases in aquaculture cause about 10% production loss
Annual Loss Estimate in India

- Shrimp diseases in the country (2018-19)- ~Rs. 7000/- crores
- Argulosis in carp culture ponds (2011-12)- Rs. 300 crores



Prevention and Control of Infectious and Contagious Diseases in Animal Act, 2009

PUBLISHED BY AUTHORITY

सं० 29] नई दिल्ली, शुक्रवार, मार्च 20, 2009 / 29 फाल्गुन, 1930
 No. 29] NEW DELHI, FRIDAY, MARCH 20, 2009 / 29 Phalguna, 1930

इस भाग में भिन्न पृष्ठ संख्या दी जाती है जिससे कि यह अलग संकलन के रूप में रखा जा सके।
 Separate paging is given to this Part in order that it may be filed as a separate compilation.

MINISTRY OF LAW AND JUSTICE
 (Legislative Department)

New Delhi, the 20th March, 2009/Phalguna 29, 1930 (Saka)

The following Act of Parliament received the assent of the President on the 20th March, 2009, and is hereby published for general information:—

THE PREVENTION AND CONTROL OF INFECTIOUS AND CONTAGIOUS DISEASES IN ANIMALS ACT, 2009

- **Early detection- key to control of infectious diseases**
- **Surveillance - a primary requirement for effective health management**

Launch of NSPAAD Programme

- Pan-India coverage
- Scientific advice to the fish farmers to reduce disease losses
- Involvement of State Fisheries Departments and MPEDA
- Disease app for timely reporting of diseases by the farmers



Project Investigators: 106
Young Professional-II: 67



Strengthening of Passive Disease Surveillance

223 Meetings involving 8583 fish farmers



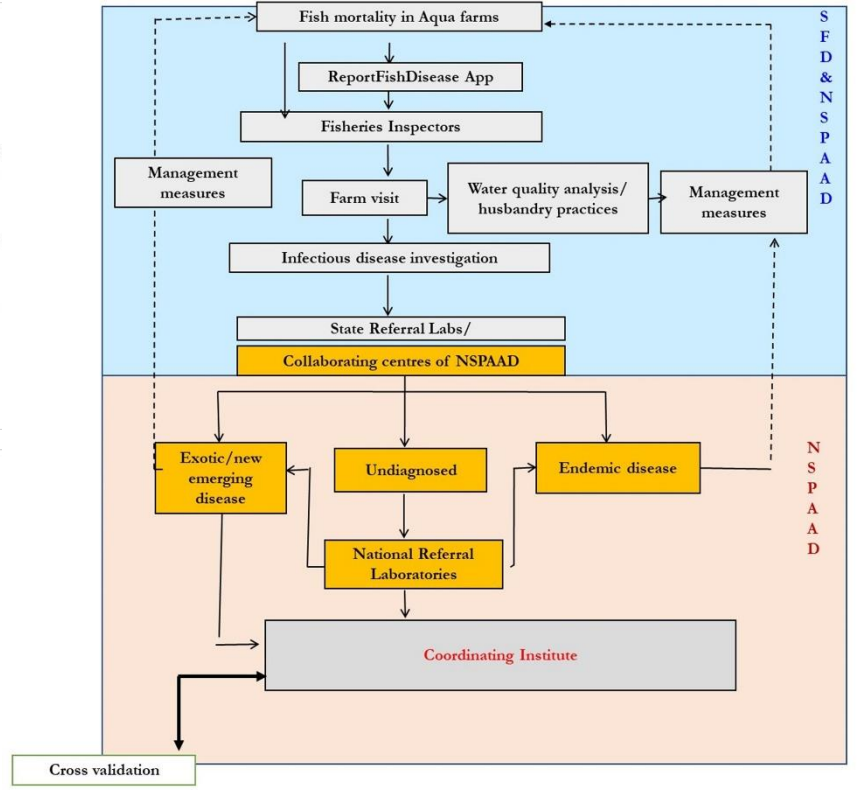
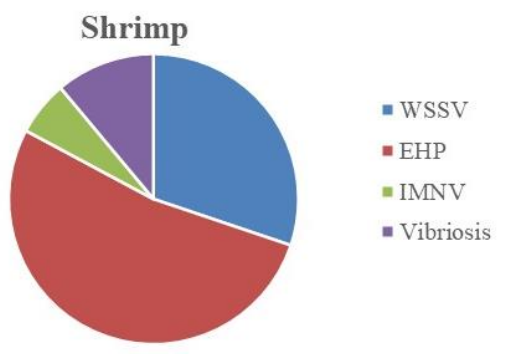
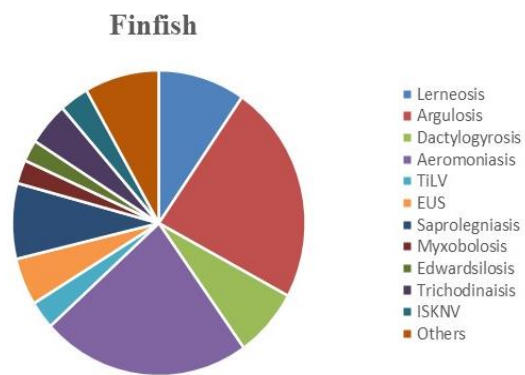
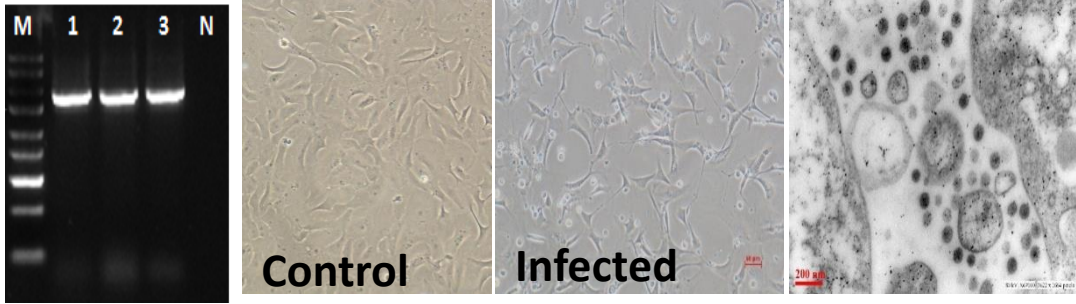
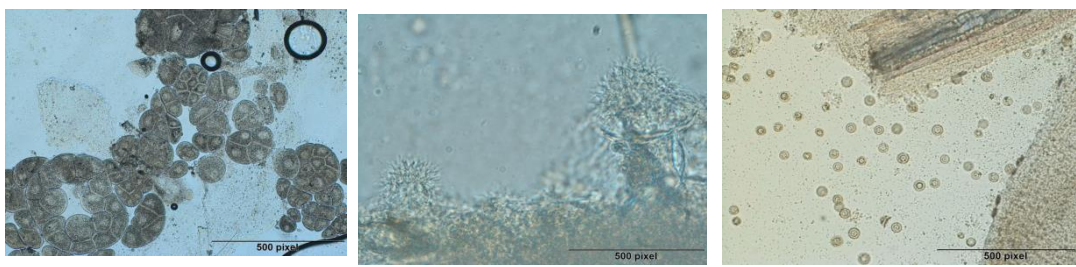
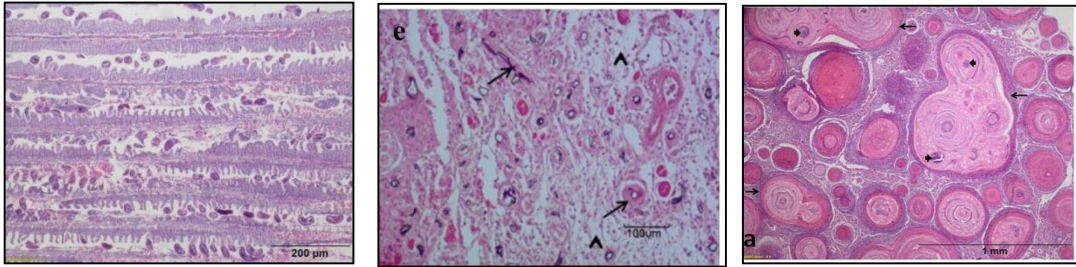
Awareness Literature



HRD- 38 Training programmes involving 699 officers of SFDs & research scholars



Reporting Disease Cases & Mechanism of Disease Governance



Nodal/ Co-nodal Officers	• Implementation of fish disease surveillance & reporting in the state
District Fisheries Officers	• Implementation of fish disease surveillance & reporting at district level
Block-level officers	• Preliminary investigation and collection & transportation of samples • Scientific advice to farmers /Sharing the results of disease investigation

Scientific Advisory to the Farmers and Stakeholders for Disease Management

Taken Feed	HSC	Balance
140 kg	7	6093
104 "	195	5878
369 "	1261	4637
146 "	0	4637
267 "	1	4636
406 "	0	4636
533 " (196514)	0	4628
768 " (2733)	22	4606
949 " (2982)	3	4603
	1497	

Feed = 9982 kgs.
 = 5034
 = 1916 kgs + 5% = 20118 kgs.
 out = 1497 24%
 = 431 (sulphur) (48 from 140)



भा.कृ.अनु.प.—राष्ट्रीय मत्स्य आनुवंशिक संसाधन ब्यूरो
 (राष्ट्रीय कृषि अनुसंधान परिषद)
 ICAR-National Bureau of Fish Genetic Resources
 (Indian Council of Agricultural Research)
 Canal Ring Road, Fish Hatchery, P.O. Dillibaha, Lucknow - 226 002, Uttar Pradesh, India
 Ph.: (0522) 244735, 244845, 792501/218-19 Fax: (0522) 242403
 E-mail: nbgr@icar.org.in; director@nbgr.res.in; director.nbgr@icar.gov.in; Website: www.nbgr.res.in

एन.एन.पी.ए.ए.जी./एन.बी.एफ.जी.आर./2023/03/आमरणक्र.2 दिनांक: 21/06/2023
 श्री वैश्व साधन जो
 महोदय,
 आपको सूचित किया जाता है कि जो मछली के समूह अपने आपको चार्म से लिए थे, उन मछली को जीव *Edwardsiella ictaluri* संक्रमण से निपटारे के लिए की गई। जीव का विस्तृत विश्लेषण जल की गुणवत्ता का मापदण्ड निर्धारण है।
 तारीख 1. रोगणु की जाँच

क्रम संख्या	रोगणु की जाँच	परिणाम
1.	<i>Edwardsiella ictaluri</i>	पेसिटिव

तारीख 2. चार्म की गुणवत्ता की जाँच

क्रम संख्या	चार्म की गुणवत्ता के पैरामीटर	पराम	इष्टतम पराम
1.	पीएच	7.5	7.5-8.5
2.	तापमान (सिलीसियस/डिग्री)	31	25-28
3.	अम्लीयता (सिलीसियस/डिग्री)	2	1 से कम

आपको सूचित करना चाहता हूँ कि आपके तास्ब में अमोनिया इष्टतम सीमा से अधिक है। इसलिए आपको अपने तास्ब में अमोनिया कम करने की जरूरत है।
प्रश्न
 • चार्म बदलें
 • जलवायु से जमाव मछली को तास्ब में रखने, जलवायु से जमाव रोकना दें, और खाने की बचती से बचें
 • डिजिटल टैग का प्रयोग करें (40 डिजिटल टैग/एकर)
 यदि आपको अधिक जानकारी चाहिए तो कृपया प्रश्न की बीमारी के लक्षण या बीमारी से सम्बंधित कोई समस्या होती है तो आप हमसे निरंतर संपर्क कर सकते हैं।
 (डॉ. पी. के. प्रसाद)
 प्रमुख वैज्ञानिक

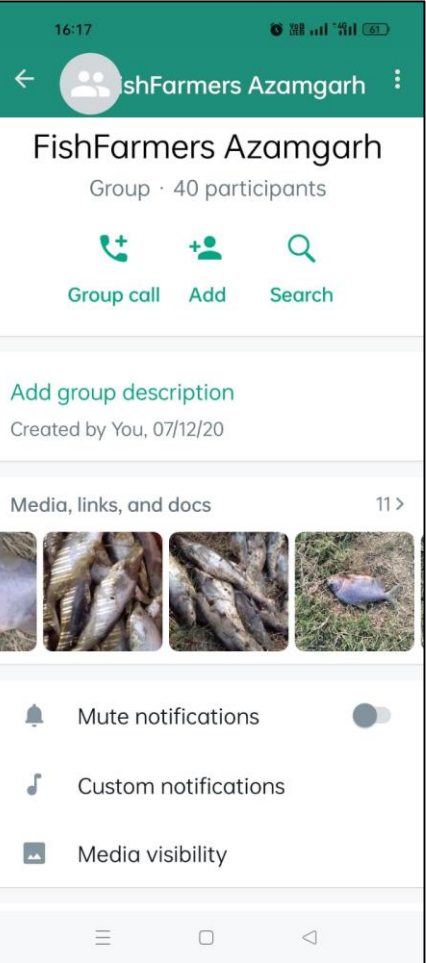
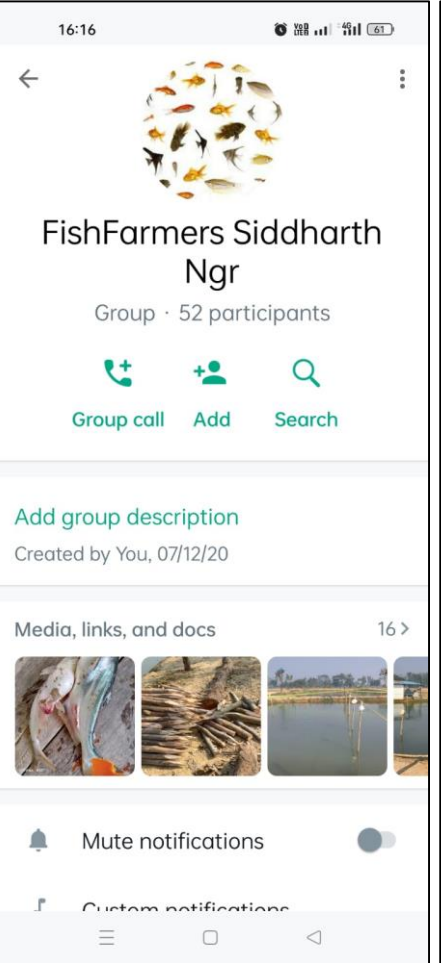
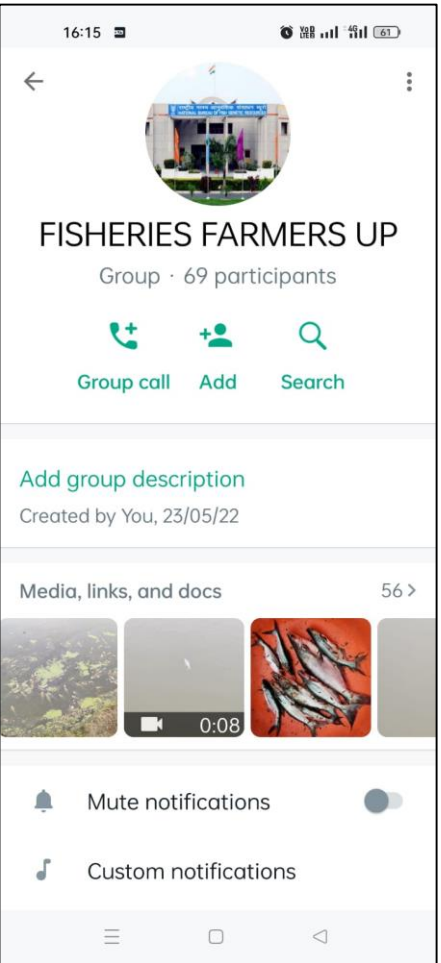
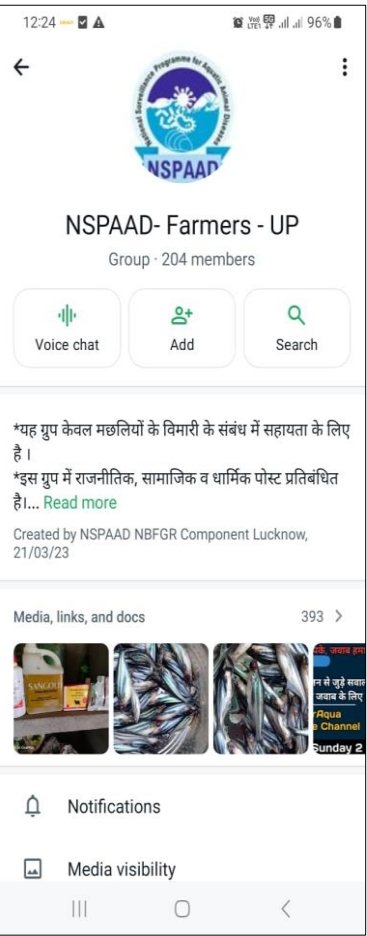


Farm No.	Farm address	GPS coordinates	Mortality (%)	Effect of intervention
				Mortality (%)
1	Jairajpur, Azamgarh	N 26°11'32'' E 83°10'35''	15-20	0
2	Jairajpur, Azamgarh	N 26°11'38'' E 83°10'42''	25	0
3	Kaptanganj, Azamgarh	N 26°14'50'' E 83°6'39''	25-30	0
4	Jairajpur, Azamgarh	N 26°11'32'' E 83°10'35''	15-20	0
5	Jairajpur, Azamgarh	N 26°11'12'' E 83°10'8''	20-25	0
6	Gaddopur, Phulpur, Azamgarh	N 26°0'13'' E 83°3'7''	10	0

Developing WhatsApp Groups with Fish Farmers

S.No.	Date	Name of Farmer	Species	Culture System	Disease/Problem
1					
2					

Case Number: 96	Date: 07/01/20		
Name: Ajay Singh			
Address: Lucknow			
Contact No: 860386 0055			
Culture system: Maucculture, pond			
Types of culture: Banggai			
Species being cultured: pangasius			
Size of fish: 25-40gm			
Area of culture system: about 7-8 acre			
Number of fish: 20 thousands			
Area of affected pond: 1 acre			
Species affected: pangasius			
Number of affected fish: 500 fish			
Mortality percentage: 500 died in 2 days			
Clinical signs and gross lesions: Cotton like growth, red eyes, dull vent			
Medication already applied: Fungicide, Mycostop, antibiotic			
Medicine suggested: Osmil (4hrly x 3days)			
Water quality parameters:			
Latitude: 25°45'20"N			
Longitude: 80°50'15"E			
Following up:			
Mortality (%)	Increased	Decreased	Remained same
Date: 07/01/20			
Date: 07/01/20			
Feedback from the farmer: No mortality since last day after applying Osmil 3 rd dose			

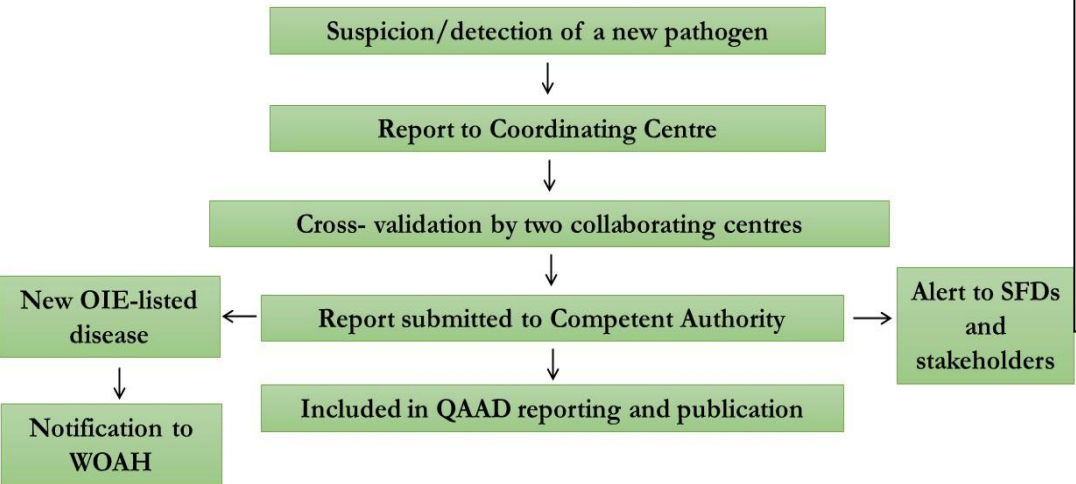


Contacting farmers telephonically for disease-related problems

Contacting farmers through WhatsApp for disease-related problems

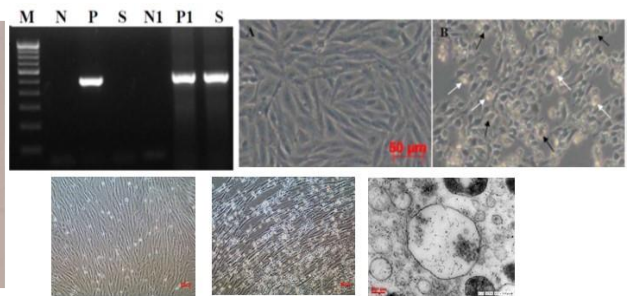
First-time Detection of Aquatic Animal Pathogen in the Country

Reporting Mechanism of a New Disease



Tilapia Parvovirus

- Nile tilapia collected from grow-out ponds in Ranipet district, Tamil Nadu
- Samples confirmed to be infected with Tilapia parvovirus using PCR assay, Sequencing, Isolation of Virus and Experimental infection



Wenzhou shrimp virus 8

Shrimp samples received from ICAR-CIBA were validated by ICAR-NBFGR and RGCA, Nagapattinam and found positive for the Wenzhou shrimp virus 8.



Following validation, a compiled report submitted to Department of Fisheries, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India

'ReportFishDisease' Mobile App: e-Governance in Aquatic Animal Health Management

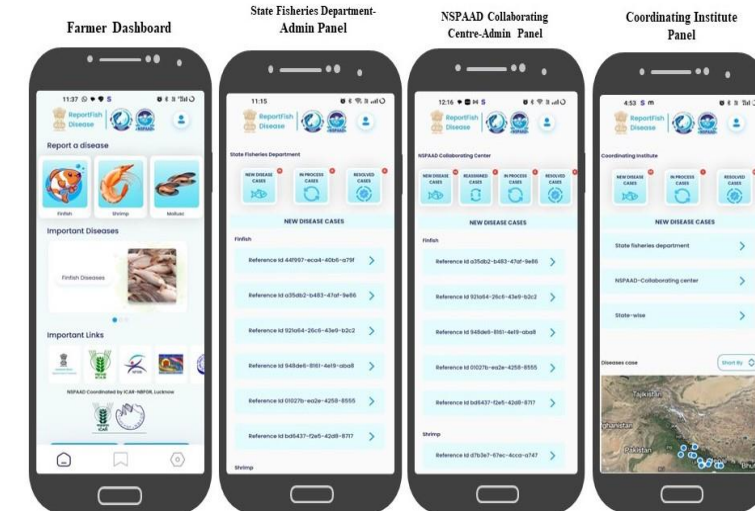
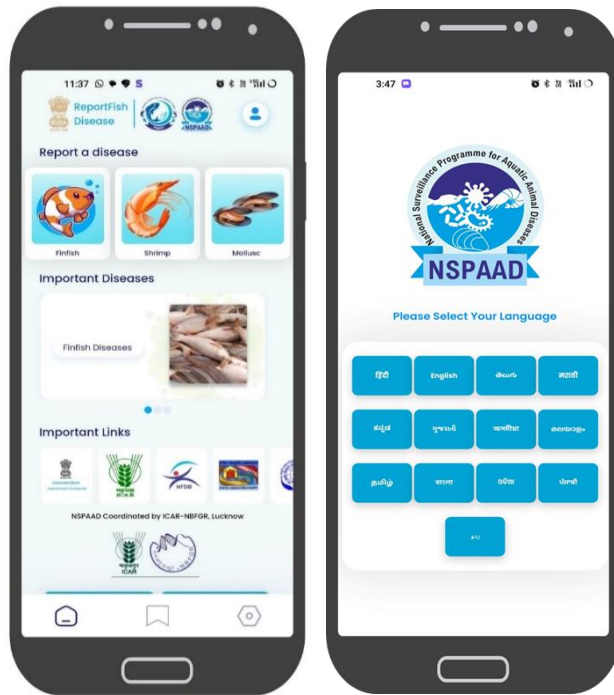


- At present, many of the disease incidences in aquaculture go unreported
- Necessity of a mechanism to connect farmers, field-level officers and fish health experts

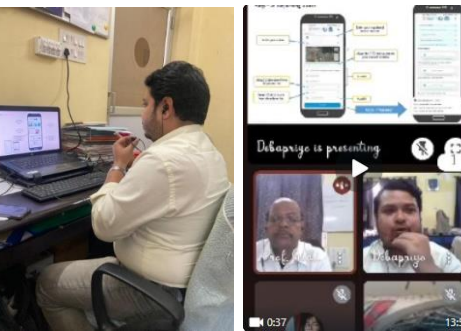
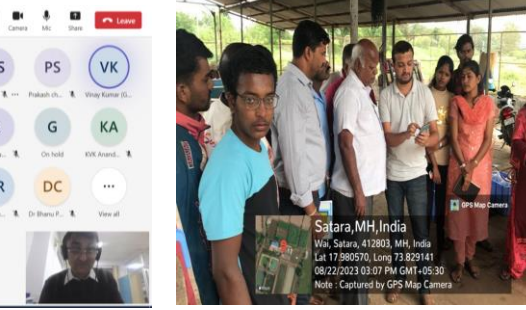
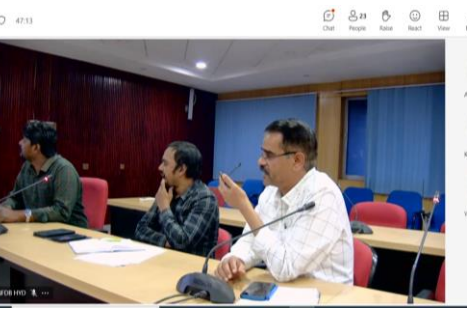
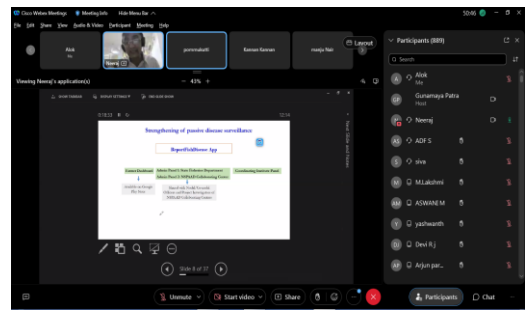


Advantages

- Real time reporting of disease cases and improvement in reporting of number of cases
- Timely advice to the farmers thereby reducing losses
- Automatic geotagging of the farms
- Monitoring disease cases on temporal and spatial scale



Popularization of 'ReportFishDisease' App



Kolkata, (KCN): The ICAR-CIFRI has organized one-day awareness program on fish disease surveillance and Report fish disease application program for effective health management under the NSPAAD phase II project funded by Pradhan Mantri Matsya Sampada Yojana (PMMSY) at ICAR-CIFRI, Barrackpore, Kolkata. Under the supervision of the Director, ICAR-CIFRI, Dr. B.K. Das, 26 officials from Jharkhand state

liveliness promotion society, under Rural development department, Jharkhand were enlightened about the newly developed application 'Report fish disease' on 27th December 2023. These officials were working for the development of the fisheries sector in Serakela, Khunti and Gumla districts of Jharkhand. The application was installed on the mobile phones of officials and the working principle and benefits were informed. The team

also enlightens the gathering on several areas of disease surveillance and health management of fish including the aquatic environment vis-à-vis antimicrobial resistance issues, the status of fish disease management, sustainable approaches for aquaculture development, etc. The program was coordinated by Dr. Vikash Kumar, Mr. Ansum Kumar, Jana and research scholar of the NSPAAD Phase II project Souvik Dhar, Anupam Adhikari with great efficiency.



National Database on Aquatic Animal Diseases



Distribution maps

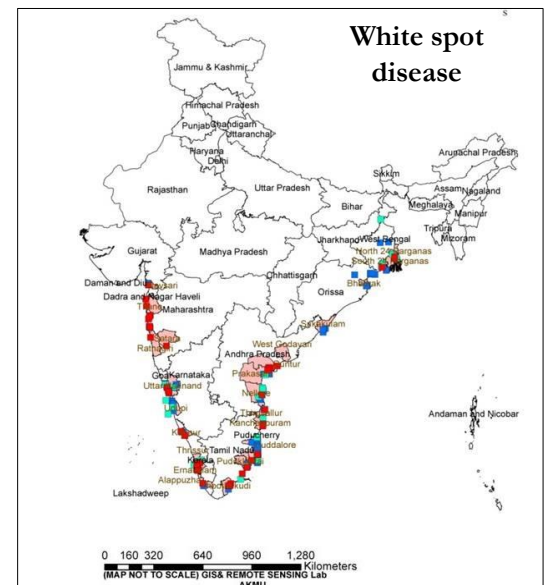
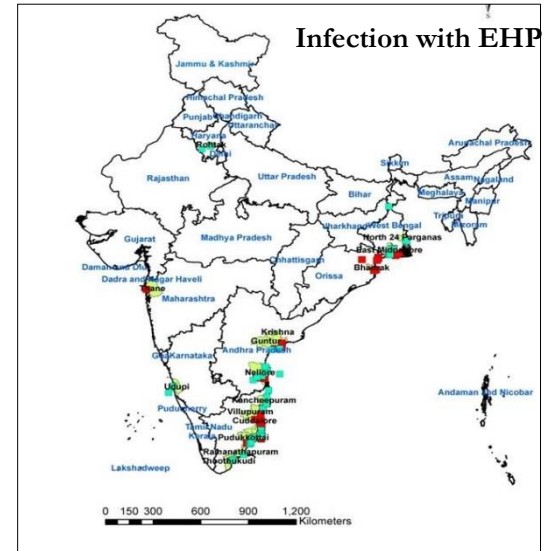
- Home
- Collaborating Centers
- Research Group
- States Covered
- Gallery
- Events
- Download
- Login

Download

- NSPAAD Application User Manual
- Format for Baseline Information of the Farm
- Format for Biological Sample Collection- Finfish
- Format for Biological Sample Collection- Crustaceans
- Format for Biological Sample Collection- Molluscs
- Format for Collection of Information from Disease Outbreak- Finfish
- Format for Collection of Information from Disease Outbreak- Crustaceans
- Format for Collection of Information from Disease Outbreak- Molluscs

BASE LINE DATA OF THE FARM

Date : *	
State : *	
District : *	
Block : *	
Village : *	
Contact details :	
Name of the farm :	
The farm has been operational since (year) :	
Owner of the farm :	
Contact person name : *	
Village :	
Block :	
Pin code :	
Phone No :	
GPS Coordinates :	
Latitude :	
Longitude :	
Details of the farm :	
Ownership of the farm :	<input type="checkbox"/> Owned <input type="checkbox"/> Community <input type="checkbox"/> Leased <input type="checkbox"/> State farm <input type="checkbox"/> None
If leased :	From: To:
Type of farm : *	<input type="checkbox"/> Brackishwater <input type="checkbox"/> Cold water <input type="checkbox"/> Freshwater <input type="checkbox"/> Mariculture



NSPAAD LOGIN PANEL

Welcome To NSPAAD! Please enter your user name and password to sign in

Username

Password

LOGIN

Remember me



Pradeep Mandal farm, Balasore, Odisha

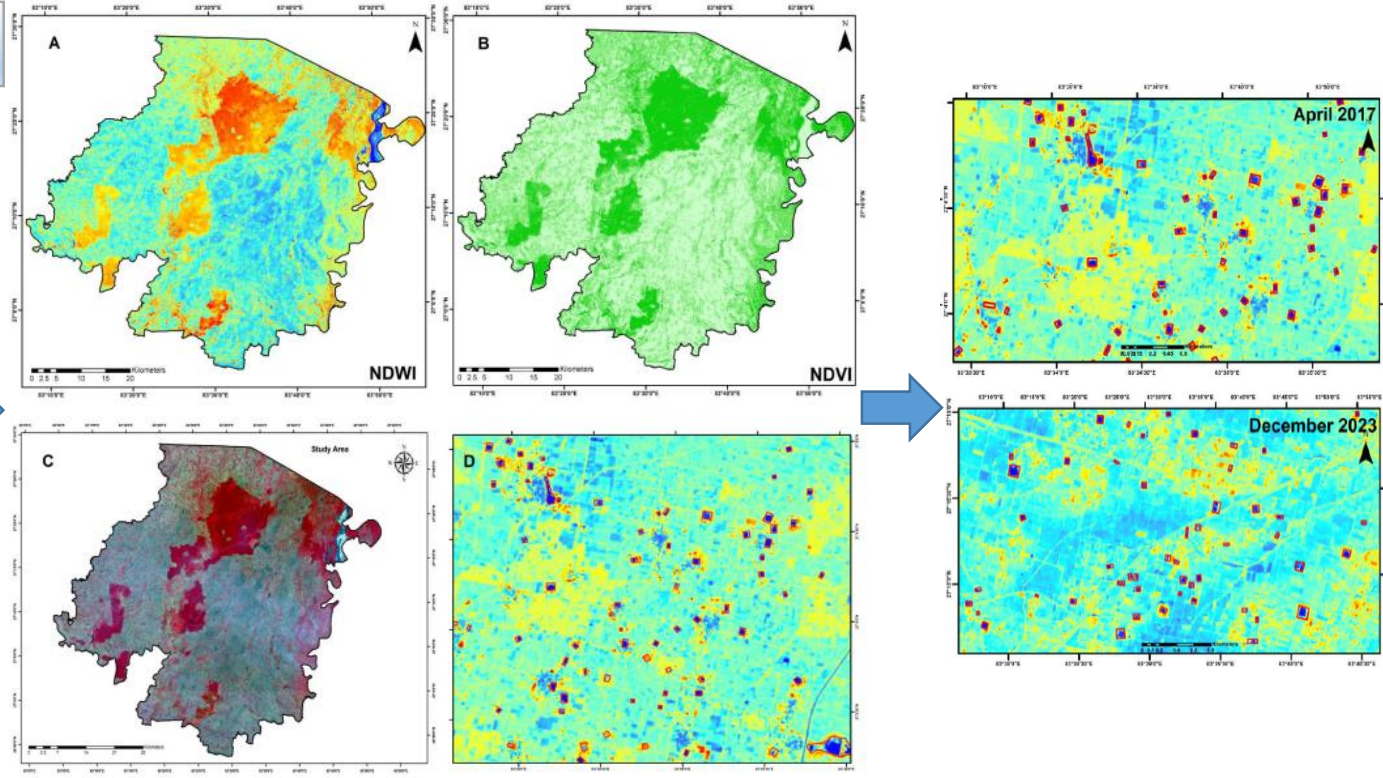
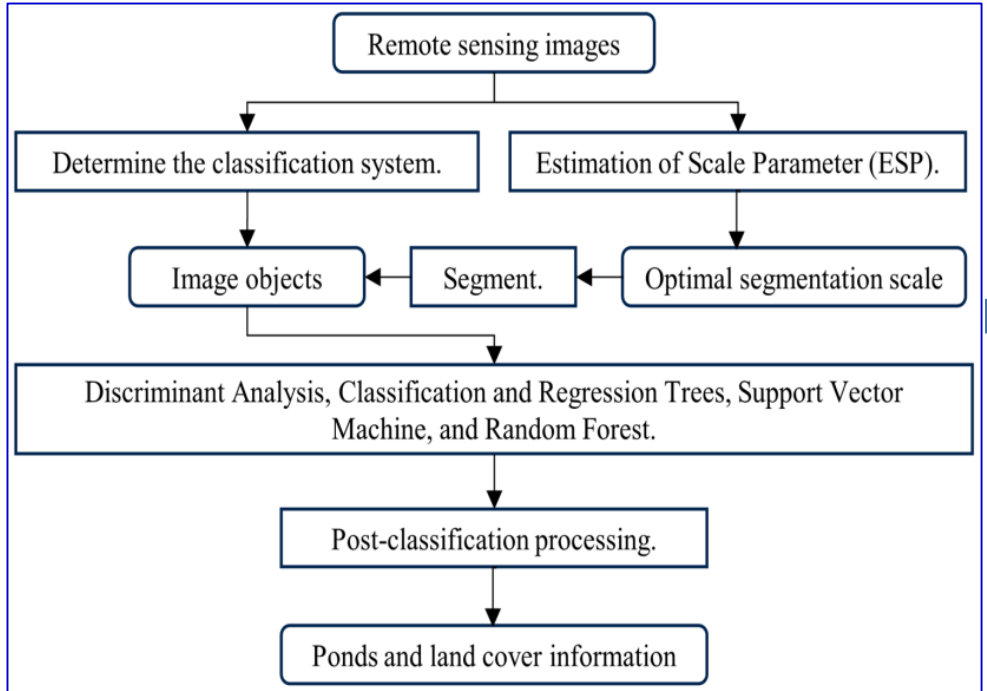
Disease Outbreaks - Finfish	
Date:	21/01/2022
Name of the farm:	Vikash farm
Address:	Balasore, Odisha, IN
Contact Person:	Vikash Kumar Sankha
Phone number:	913082020
GPS Coordinates:	
Latitude:	21.250000
Longitude:	85.816667
Type of culture:	<input checked="" type="checkbox"/> Hatchery <input type="checkbox"/> Nursery <input type="checkbox"/> Larviculture <input type="checkbox"/> Grow-out
Culture system:	<input type="checkbox"/> Semi-intensive <input type="checkbox"/> Intensive <input type="checkbox"/> Integrated
Fish species cultured:	<input type="checkbox"/> Catla <input type="checkbox"/> Rohu <input type="checkbox"/> Mrigal <input type="checkbox"/> Common carp <input type="checkbox"/> Silver carp <input type="checkbox"/> Grass carp <input checked="" type="checkbox"/> Any Other: Tilapia
Pre-stocking pond preparation:	<input type="checkbox"/> Desilting <input type="checkbox"/> Dewatering <input type="checkbox"/> Drying <input type="checkbox"/> Fertilization <input type="checkbox"/> Application of aquatic insects <input type="checkbox"/> Churning <input type="checkbox"/> Application of aquatic plants <input type="checkbox"/> Mahua oil cake <input type="checkbox"/> Application of weed fishes <input type="checkbox"/> Stone <input type="checkbox"/> Any Other:
Stocking details:	Month: <input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> June <input type="checkbox"/> July <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec
(In case of multiple stockings put 1 equivalent month as well as size as stocking for 1 st stocking. Similarly, for 2 nd ... For subsequent stockings)	Size at stocking: <input type="checkbox"/> Less than 5 g <input type="checkbox"/> 25-100 g <input type="checkbox"/> 100-250 g <input type="checkbox"/> 250-500 g <input type="checkbox"/> Greater than 500 g
Stocking Density (per hectare):	50000 x 2
Source:	<input type="checkbox"/> Government <input type="checkbox"/> Private <input type="checkbox"/> Any Other:
Standing biomass (kg):	100 kg
Feeding:	<input type="checkbox"/> Dry <input type="checkbox"/> Wet <input type="checkbox"/> Floating feed <input type="checkbox"/> Rice bran <input type="checkbox"/> Sinking pellets <input type="checkbox"/> Rice bran - oil cake mixture <input type="checkbox"/> None <input type="checkbox"/> Any Other:
Feeding method:	<input type="checkbox"/> Manual <input type="checkbox"/> Automatic <input type="checkbox"/> Any Other:
Water Quality Parameters:	
1. Type of recording:	Max. NO. Min. U.S. NSPAD

Water Body Detection using Remote Sensing & GIS Techniques

The five important key pond detection techniques utilizing remote sensing and GIS in Maharajganj District

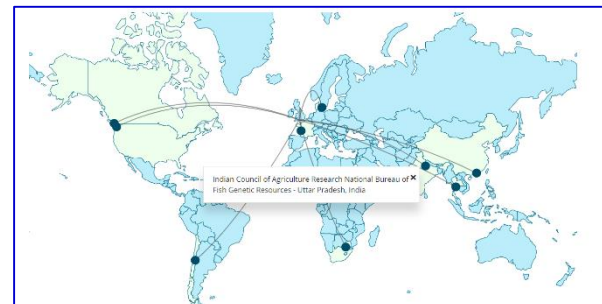
- Spectral Analysis, Texture Analysis, Change Detection, Object-Based Image Analysis (OBIA), Hydrological Modeling Integration

Processing of Sentinel-2 satellite Image

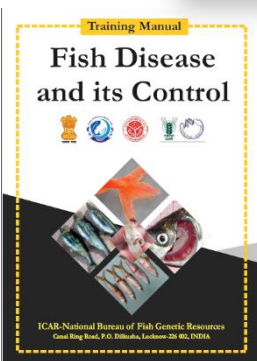


Impacts of Disease Governance under NSPAAD

- A strong **network** of Aquatic Animal Health Laboratories across the country
- **Strengthening** of passive disease surveillance in the country
- **Diagnostic capability** for OIE/NACA listed and emerging diseases
- Mechanism for **first time reporting** of exotic/emerging diseases
- System for **alerts and advisories** following suspicion/confirmation of new disease
- Providing **scientific advice** to the farmers



RFD app will serve as a platform for strengthening eGovernance on Aquatic Animal Disease Management in the country



Received: 2 August 2023 | Revised: 19 September 2023 | Accepted: 25 September 2023
 DOI: 10.1111/j.1365-3113.2023.107961.x

RESEARCH ARTICLE

Widespread occurrence of Tilapia parvovirus in farmed Nile tilapia *Oreochromis niloticus* from India

Kooloth Valappil Rajendran¹ | Neeraj Sood² | B. Madhusudhana Rao³ | Anisha Valsalam¹ | Megha K. Bedekar⁴ | Kezhedath Jeena¹ | Pravata Kumar Pradhan² | Anutosh Paria² | Thangaraj Raja Swaminathan² | Dev Kumar Verma² | Naresh Kumar Sood²

Abstract
 Tilapia parvovirus (TiPV) has been associated with heavy mortalities in tilapia as a single infection or in co-infection with Tilapia lake virus (TiLV). In this study, TiPV was detected in farmed Nile tilapia, *Oreochromis niloticus*, from two geographical regions of India, Maharashtra and Uttar Pradesh. TiPV-specific polymerase chain reaction (PCR) reported earlier was used in the screening. Tilapia collected from Maharashtra showed characteristic clinical signs, and TiPV was detected along with TiLV and/or *Aeromonas* spp. However, fish from Uttar Pradesh were apparently healthy and only TiPV could be detected in these samples. A high prevalence of TiPV was recorded from both the geographical locations, Maharashtra and Uttar Pradesh (59.0% and 93.0% respectively). The virus could be detected in tissues such as the spleen, liver, kidney, brain and muscle. The spleen appeared to be the best tissue for detecting TiPV.

Journal of Invertebrate Pathology 199 (2023) 107961

Contents lists available at ScienceDirect
Journal of Invertebrate Pathology
 journal homepage: www.elsevier.com/locate/jip

Characterization of *Enterocytozoon hepatopenaei* causing hepatopancreatic microsporidiosis in *L. vannamei* and a new molecular method for its detection in shrimps, and other environmental samples

Mithun Raj, G. Sathiyaraj, Biju Narayanan, B. Babu, Mathews Varkey, K. Karthickkannan, R. Ganeshamurthy, Anup Mandal¹, S. Kandian

Abstract
 Hepatopancreatic microsporidiosis (HPM) caused by *Enterocytozoon hepatopenaei* (EHP) is a disease of concern in almost all shrimp growing countries. The pathogen was characterized by ultra-microscopy, histopathology and phylogenetic analysis of 18S rDNA. A total of 183 biological samples were collected from all major shrimp growing states of the country. The knowledge technique could be used very well in identifying the site of



AWARENESS PROGRAM ON DISEASE SURVEILLANCE AND HEALTH MANAGEMENT OF FISH (UNDER NSPAAD PHASE II PROJECT)

VENUE :
SINDRANI WETLAND NORTH 24 PARGANAS

DATE :
13 - 04 - 2023

Organized by
ICAR - Central Inland Fisheries Institute, Barrackpore, Kolkata

Global Recognition

**3rd International Conference on Aquatic Animal Epidemiology
(November 30 - December 2, 2023)**

**School on Aquatic Animal Epidemiology
(December 4-8, 2023)**



**Resource person: Prof. K.L. Morgan,
Emeritus Professor, University of Liverpool**



**Nearly 200 participants including 20
international experts**



Presentation of NSPAAD at FAO, Rome

Way Forward

- Improved reporting of disease cases using ReportFishDisease App
- Research on developing user-friendly tools of e-governance in fisheries and aquaculture for sustainable management
- Linking aquaculture insurance policies with disease reporting in the RFD App
- Baseline information of Fish Farms with geo-coordinates
- Strengthening of National Database on Aquatic Animal Diseases
 - ❑ Developing disease prediction models
 - ❑ Control strategies for major diseases affecting aquatic animals
- Use of artificial intelligence for disease diagnosis

Use of E-Governance to monitor, manage and control aquatic animal diseases for sustainable aquaculture development

Acknowledgements

- **Minister of Fisheries, Animal Husbandry and Dairying, Government of India**
- **Secretary, Department of Fisheries, Govt. of India**
- **Secretary, Department of Administrative Reforms and Public Grievances**
- **Secretary, DARE and DG, Indian Council of Agricultural Research (ICAR)**
- **Jt. Secretaries, Department of Fisheries, Govt. of India**
- **Coordinator, NSPAAD and DDG (Fy. Sc.), ICAR**
- **Co-coordinator, NSPAAD and Director, ICAR-NBFGR**
- **State Fisheries Departments**
- **Collaborating Centres, NSPAAD**

Thanks....