Food and Agriculture Organization of the United Nations

NITTE (Deemed to be University)

FAO Reference Centre

Annual Report (January 2026- February 2026)

Title of FAO Reference Centre: FAO Reference Centre for Antimicrobial Resistance (AMR) & Aquaculture Biosecurity (AB)

Name of the institution: Nitte University

Country: India

Date of report: 28February

<table>
<tr><td colspan="3">Name of the Institute's Responsible Officer: Prof Dr Indrani Karunasagar
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<tr><td rowspan="2">Years of the Designation:</td><td>From</td><td>To</td></tr>
<tr><td>January 2026</td><td>February 2026</td></tr>
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Activities Related to Supporting Raising Awareness on AMR

1. **National conference on AMR One Health (OH)**

Dr. Indrani Karunasagar and Prof. Dr. Iddya Karunasagar were invited to participate in the AMR One Health (OH) Conference held in Thailand from 2–4 February 2026. The conference focused on antimicrobial resistance (AMR) within the One Health framework, bringing together global experts to discuss integrated approaches to human, animal, and environmental health. They were accompanied by other staff members including Dr. Krishna Kumar, Associate Professor, Dr. Akhila D. S., Associate Professor, Deekshit, Associate Professor, Dr. Praveen Rai, Associate Professor, and Dr. Prathvisagar, Project Associate. The delegation actively engaged in scientific discussions, knowledge exchange sessions, and collaborative networking with international researchers. Their participation highlighted the continued commitment of the institute to addressing global AMR challenges through interdisciplinary research and collaboration.

2. **Capacity building programme on "Towards Sustainable & Resilient Global Ecosystem: A One Health Approach"**

Dr Indrani Karunasagar was invited as guest of Honour for The Capacity Building Programme titled "Towards Sustainable and Resilient Global Ecosystem: A One Health Approach" was organized by NITTE–GOK Centre of Excellence (NITTE-GOK COE) C on

29–30 January 2026. The programme focused on strengthening interdisciplinary understanding of the One Health approach by integrating human, animal, and environmental health perspectives for sustainable ecosystem management. Experts from diverse fields delivered lectures and interactive sessions addressing emerging global challenges, ecosystem resilience, and the role of science and policy in promoting sustainability. The programme provided participants with practical insights into collaborative approaches for managing health risks and environmental threats. The event served as an important platform for capacity building and knowledge exchange among students, researchers, and professionals working in the area of One Health.

Support Developing Capacity for Surveillance of AMR, AMU and Residues

1. **Training programme on "Integrated Food Safety Management Regulatory Compliance Training: HACCP Training & ISO 22000 Internal Audit**"

The Department of Food Safety & Nutrition at the Nitte University Centre for Science Education & Research (NUCSER), under Nitte (Deemed to be University), organized the inaugural programme of HACCP Training & ISO 22000 Internal Audit on 25 February 2024. Dr. Iddya Karunasagar, was invited as the Chief Guest. The training initiative aimed to strengthen knowledge and implementation of HACCP principles and ISO 22000 internal auditing practices in food safety management systems.

2. **Workshop on "Genomic Technologies In Antimicrobial Resistance (AMR) Research"**

The Centre organized a three-day capacity building programme titled "Genomic Technologies in Antimicrobial Resistance (AMR) Research" from 21–23 January 2026. The programme focused on introducing participants to modern genomic approaches for studying antimicrobial resistance, including whole genome sequencing, data analysis, and interpretation of AMR-related genetic information. The training aimed to strengthen technical skills and enhance research capacity among participants working in the field of microbiology and antimicrobial resistance.

Support Strengthening Governance Related to AMU, AMR, and Aquaculture Biosecurity

1. World Seafood congress 2026

World Seafood Congress 2026 was held from 9–11 February 2026 at the Chennai Trade Centre, bringing together global leaders, policymakers, researchers, and industry stakeholders from across the seafood sector. Organized by the International Association of Fish Inspectors in collaboration with the MPEDA (Marine Products Export Development Authority), the congress focused on the theme “Sustainable Solutions for Inclusive Growth - Building a Safer, Fair and Resilient Global Seafood Trade.” The event featured panel discussions, technical sessions, and networking forums aimed at strengthening international cooperation and promoting responsible fisheries and aquaculture practices. Dr Iddya Karunasagar was invited to the congress in recognition of his distinguished contributions to seafood safety, quality assurance, and global trade standards.

Promote Good Aquaculture Practices and Prudent Use of Antimicrobials

1. **AquaSolve 2026: Transforming Research with Real-World Needs**

Dr Indrani Karunasagar was invited as an evaluator for a programme organized by NITTE–GOK Centre of Excellence. The programme was conducted on 16 January 2026 and focused on promoting industry-driven research in aquaculture and fisheries. The event highlighted the importance of addressing real-world challenges through scientific innovation and strengthening collaboration between academia and industry. Technical sessions covered topics such as aquaculture and ornamental fisheries, hatchery technologies and fish feed production, fish processing and entrepreneurship, and marine fisheries policy and regulations. Experts from industry, academia, and government organizations participated as speakers and panel members, providing practical insights and facilitating knowledge exchange among participants.

2. **One-Day National Conference on Smart Biomaterials and Next-Generation Drug Delivery Platforms**

The NGSM Institute of Pharmaceutical Sciences (NGSMIPS), Mangalore, under Nitte (Deemed to be University), organized a One-Day National Conference on Smart Biomaterials and Next-Generation Drug Delivery Platforms on 20 February 2026. Dr Indrani was invited as the Chief guest and Guest of honour.

3. **Workshop on"Translating Biology to Industry: A Hands-On Training on Bioprocess Technologies**

The Departments of Bio & Nano Technology and Food Safety and Nutrition, NUCSER organized a three-day Industry-Academia workshop on"Translating Biology to Industry: A Hands-On Training on Bioprocess Technologies" on 20 February 2026. Dr. Indrani Karunasagar was invited to deliver a talk on "Industrial Applications of Bioprocessing: Harnessing the Power of Living Systems to Transform Modern Manufacturing." Her address highlighted the transformative role of living systems in advancing sustainable and innovative manufacturing practices. The workshop aimed to bridge academic research and industrial applications through practical exposure to bioprocess technologies.

List of Publication:

1. Ajakkala PB, Kenjar AR, Prabell S, Bhandarkar S, Bhat S, Sannejal AD, Karunasagar A, Chauhan A, Karunasagar I, Raj JR. Updated phage banks essential to cope with pathogen evolution: Lessons from *Klebsiella pneumoniae* and their phages. Journal of Microbiology, Immunology and Infection. 2025 Aug 29:S1684-1182(25)00178-1. doi: 10.1016/j.jmii.2025.08.022. Online ahead of print

2. Shetty NS, Shubha JR, Satyaprasad AU. Quantum-Dot-Based Enzyme Biosensor for Rapid Screening of Antibiotic Susceptibility in Urine Samples. ACS omega. 2026 Jan 6.

3. Prabhakar S, Premanath R. Dynamics, ecological implications, and mitigation strategies of the ocean plastisphere. Environmental Science and Pollution Research. 2026 Jan 8:1-22.

4. Shreevani K, Narayana B, Sarojini BK, Dayananda BS, Revanasiddappa BC, Shetty VP, Deekshit VK, Jayaprakash K. Evaluation of Eudragit/Polycaprolactone/2, 3-Diphenyl-3-Hydroxyflavone Derivative Composite Electrospun Nanofibers for Sustained Drug Delivery. Journal of Applied Polymer Science. 2026 Mar 15;143(11):e70256.

5. Shetty P, Bhat R, Padavu S, Rai P, Shetty S. Profiling of microbes associated with chronic irreversible pulpitis using metagenomic next-generation sequencing. BMC Oral Health. 2026 Dec;26(1):118.

6. Rohit A, DSouza C, Prasad M, Akshay SD, Irusan D, Jenifer A, Dorairajan SK, Boahen CK, Karunasagar I, Kumar V. Age-specific predictive modelling of sepsis mortality: The diagnostic utility of CRP and serum creatinine. Respiratory Medicine. 2025 Nov 29:108530.

7. Karunasagar A, DSouza C, Pugazhenthi AA, Alli B. Systematic Review of biofilms and potential antibiofilm agents in chronic rhinosinusitis. Indian Journal of Otolaryngology and Head & Neck Surgery. 2025 Nov 17:1-8.

8. Gollapalli P, Gnanasekaran TS, Shivashankara SK, Kumar BK. Genome-scale mapping of *Serratia marcescens* core interactome to probe essential proteins and functional modules. Biologia. 2026 Jan 12;81(1):7.

9. Devi Thillai B, Kini S, Deekshit VK. Nanobiotics to tackle efflux-mediated resistance in bacterial pathogens. Critical Reviews in Microbiology. 2025 Dec 3:1-23.

10. Prabhu C, Kotian A, Aditya V, Deekshit VK. Environmental and physiological factors influencing the survival of resistant *Salmonella* under infection-related gut conditions. Clinical Microbiology Reviews. 2025 Dec 5:e00196-25.

11. Rao N, Rai D, Madival S, Mithoor D. Exploration of polyhydroxyalkanoate-producing bacteria in diverse soils with emphasis on bioremediation. International Journal of Environmental Health Research. 2025 Nov 27:1-22.

12. Vittal R, Xavier S, Mohan M, Chakraborty A, Chakraborty G. Detection and characterization of microplastics in commercial salts in India.

13. DSouza SY, Shetty VP, DSouza C, Karunasagar I, Deekshit VK. Investigation of antibiotic resistance determinants in aquatic environments. Biologia. 2026 Jan;81(1):23.

14. Swaroopa S, Kenjar A, Raj JR, Kedilaya VR, Gnanasekaran TS, Gollapalli P, Poonacha SK. Biological prospecting of endophytic fungi from the stem bark of *Oroxylum indicum* (L.) Kurz with antioxidant efficacy. Journal of Applied Pharmaceutical Science. 2025 Dec 5;16(1):232-43.

15. Swaroopa S, Raj JR, Gnanasekaran TS, Radhakrishna V, Poonacha SK. Phytochemical Profile and Antioxidant Potential of Endophytic Fungi Isolated from the Stem Bark of *Oroxylum indicum* (L.) Kurz. Journal of Health and Allied Sciences NU. 2026 Jan 6;16(1):124-31.

16. Yathisha UG, Srinivasa MG, Chandrashekara RB, Gopalakrishna BK, Gowda A, Salam AA, Sheshappa MB. Computational Studies of Fish Protein Hydrolysates as Human Angiotensin I-Converting Enzyme Inhibitors. Journal of Health and Allied Sciences NU. 2026 Jan 6;16(1):78-92.

17. Chaouhan HS, Sharma A, Siddique HR. Methods to Study DNA Damage Using Drosophila melanogaster. Genotoxicity Assessment: Methods and Protocols. 2025 Nov 23:449-74.

18. Rajeshwar BN, Kushala KB, Nithin MS, Nayak A, Chakraborty A, Abraham TJ. Bioinformatics in Aquatic Animal Health Management: Recent Advances and Applications. Bioinformatics Tools for Predictive Ecology and Fisheries. 2026 Jan 6:439-67.

List of Patents:

1. Process for rapid detection of *Salmonella* under isothermal conditions using polymerase spiral reaction (PSR) assay (Indian Patent No: 202541120643)
2. Process for specific detection of *Klebsiella pneumoniae* under isothermal conditions using polymerase spiral reaction (PSR) assay. (Indian Patent No: 202541120644)
3. Wearable photoplethysmography (PPG) device for continuous monitoring of cardiovascular function and pulse activity. (Indian Patent No: 202541084673)
4. Species-specific oligonucleotide primers targeting the pbp gene and process for rapid molecular detection of *Vibrio vulnificus* using loop-mediated isothermal amplification(LAMP). (Indian Patent No: 202641009234)