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PRESS NOTE

Digital India Ask Our Experts

- **Episode 53 showcases Aqua SURAKSHA, a biosensor developed by C-DAC Kolkata and ICAR-CIFRI**
- **A Portable Biosensor that uses AI to Detect Pesticide Residues in Water in Real Time**

New Delhi: The 53rd episode of Digital India Ask Our Experts, held on September 1, 2026, showcased Aqua SURAKSHA, a portable, battery-operated biosensor developed by C-DAC Kolkata in collaboration with ICAR-CIFRI to detect organophosphate pesticide residues in water.

The episode featured insights from Dr. Hena Ray, Scientist F, C-DAC, Kolkata; Dr. Subhankar Mukherjee, Project Manager, C-DAC, Kolkata; and Dr. Amrita Mukherjee Ganguli, Product Manager, Arogyam Medisoft Solution Pvt. Ltd., who discussed the development, field deployment and commercialisation of the technology.

Watch the episode on https://www.youtube.com/live/w3UMC7W220o?si=usn1F8X3N2RTLGy4



The technology addresses the growing concern of pesticide runoff from agricultural fields entering water bodies and affecting aquatic ecosystems, including fish health, reproduction and biodiversity. Unlike conventional laboratory-based testing, Aqua SURAKSHA uses an enzymatic colorimetric biosensor to

screen water samples for pesticide contamination. The portable system is designed for field-level use and can provide results without requiring complex laboratory infrastructure.

The system also integrates Artificial Intelligence (AI) and image processing to analyse changes in colour intensity in the sample and generate results. The technology has demonstrated over 90–98 per cent accuracy when compared with standard analytical instruments such as Gas Chromatography-Mass Spectrometry (GC-MS).

Speaking about the technology, **Dr. Hena, Scientist F, C-DAC Kolkata**, highlighted the importance of developing solutions that are easy to use at the field level, particularly for farmers and fishing communities. The technology has now progressed beyond the laboratory and achieved Technology Readiness Level (TRL) 9, indicating validation for real-world deployment.

Reflecting on the deeper purpose behind their work, **Dr. Subhankar Mukherjee** shared this perspective on innovation, "First you identify the problem, then you add your knowledge; so once the problem is identified, then you add your knowledge, you add your acumen and slowly that idea gets conceptualized and technology will be added as required."

As part of its commercialisation journey, the technology has been transferred to Arogyam Medisoft Solutions and rebranded as Aclivia, which is currently being used in the tea and spice industries, where rapid screening can support quality assurance and help reduce rejection of products intended for export. **Dr. Amrita Mukherjee Ganguli, Product Manager** at Arogyam Medisoft Solution Private Limited, shared her perspective on the importance of field-based innovation during the discussion. She emphasized that they prioritize listening to the needs of the community, stating, "At Arogyam, we always go to the field and talk to the farmer community just like we talk to an industry partner. We also conduct different awareness campaigns to understand the issues and know what we should do more."

The episode also explored how the technology could evolve beyond water testing. The development team is working towards applications in precision farming, with the aim of reducing unnecessary pesticide use and wastage. Future plans also include IoT-based online monitoring systems for continuous assessment of water quality and real-time alerts. This episode of Digital India Ask Our Experts demonstrates how emerging technologies such as AI, biosensors and IoT can translate scientific innovation into practical solutions for agriculture, industry and environmental protection.

Digital India Ask Our Experts programme provides citizens with an opportunity to interact with experts and gain credible, practical information on subjects relevant to their everyday lives. The programme continues to bring experts and citizens together through accessible and interactive conversations.

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