Training Brochure

HRM Training Programme on

IoT Enabled Sensing Systems and AI/ML Application in Agricultural Water Management
(Hybrid Mode)

November 11 - 13, 2024

ICAR-IIWM

ICAR-Indian Institute of Water Management (IIWM)
Bhubaneswar-751 023, Odisha

Rationale

Per capita water availability is decreasing due to population rise and increased demand from the competing sectors. India is a 'water stress' country (water availability less than 1700 m^3/ capita/year) since the last decade of 20th century and approaching to be 'water scarce' country (1000 m^3/capita/year). If the water is not managed properly will lead to a water scarce Country by 2030. Climate change and variability is further aggravating the problem of water availability. Rainwater harvesting, groundwater recharge, crop diversification with low water requiring crops, land levelling, drip and sprinkler irrigation, wastewater reuse, conjunctive and multiple use of water are being in practice for a long time to meet the water scarcity problem. Increased water scarcity is forcing towards 'per drop more crop' as compared to the earlier technologies directed towards 'more crop per drop'.

IoT Enabled smart irrigation has an important role in 'per drop more crop' concept under PMKSY by precisely applying water when the crop needs the most, at a volume with maximal use and minimal loss, and at a variable rate in field as per the soil moisture status to fulfill the crop water demand. Such systems come under smart farming that can automatically irrigate plants based on a variety of factors such as soil moisture, weather and plant parameters. Sensors are employed to continuously measure the soil moisture, weather parameters or plant indicators. Such sensors are linked to smart irrigation controllers and the later decides whether it is time for irrigation based on a threshold value integrated earlier and the present sensor reading. The volume of irrigation water to be decided based on sensor reading and the information on crop and variety, age of plant and corresponding rooting depth, and real time weather information using Application Programming Interface (API). The IoT enabled network of interconnected devices, offers a powerful solution for real-time monitoring and control of irrigation systems. Such real time and fast decision has potential of saving about 20 to 50% water which has a huge effect on water, energy and carbon foot print and climate change mitigation. Irrigation scheduling can be designed to get optimum yield and quality produce with little dependence on manual intervention. The system can add fun to farming with smartphones and computers for skilling and attracting the new generation youth to agriculture.

Objectives

The training programme is conceptualized with the following specific objectives:

- To familiarize about the problem and prospects of sensing system in agricultural water management
- Use of AI/ML in agricultural water management
- Use of IoT in agricultural water management

Level and Type of Participants

This programme is open for young and active academicians not below the rank of Assistant Professor/ Scientist/ Assoc. Professor having research/teaching experience in MoJS/CGWB/ CWC/SAUs and CAUs'/ICAR Institutes in the field of Agricultural Engineering/ Civil Engineering with specialization in irrigation and drainage engineering and soil & water conservation engineering related subjects/ Soil Science/ Agricultural Physics/ Agronomy/ Environmental Science or any other related discipline having basic working experience on irrigation science and agricultural water management. The applicant should normally be less than 45 years of age. The programme will be conducted in Hybrid mode. The total number of participants shall be limited to 20 on physical mode and maximum 50 participants in virtual mode. It is also expected that participants should have direct working experience/linkages with irrigation and water management for its development/ operation and maintenance/ research/ execution and other related activities.

Course Content

- Microcontroller based automated drip irrigation system
- Weather monitoring and data acquisition
- Integration of renewable energy resources with sensing systems
- Remote sensing and GIS for precision irrigation water management
- Groundwater management under changing climate
- IoT based water budgeting information system in aquaculture
- Iot based hydroponic & aquaponics system in poly-houses and open fields
- Socio-economics analysis of integrated sensing system
- Carbon foot print due to water saving in agriculture
- IoT enabled irrigation scheduling devices in Rice and other crops
- AI/ML application in agricultural water management

Duration: 03 Days (11 – 13 November, 2024)

Training Fee:

- ICAR Participants: No Fee

- Non-ICAR Participants: Rs.2000/- for Physical Mode and Rs.500/- for Online Mode (Fee may be paid after the nomination confirmation).

Mode of Payment:

Payment can be made through NEFT (ICAR Unit-IIWM, Bhubaneswar,

A/c No: 2977002100000985, IFSC: PUNB0297700)

Travelling and Daily Allowances:

No TA/DA will be paid by the organiser. It may be borne by the sponsoring institute.

Accommodation and Food:

Boarding and lodging facilities for participants will be arranged on a payment basis at ICAR-IIWM Guesthouse for physical mode participants. Working lunch will be provided by the organiser.

How to Apply:

Scanned copy of dully filled application form should be send to the Course Director via e-mail at s**achin.rautaray@icar.gov.in**/ **ashok.nayak@icar.gov.in**. Selected candidates will be informed by 5th November, 2024 through e-mail. A maximum of 20 participants will be selected for the training on physical mode and maximum 50 participants in virtual mode.

Last Date for Applying: 4th November, 2024

Course Director
Dr. S.K. Rautaray, Principal Scientist, ICAR-IIWM, Bhubaneswar
Mobile: +91-7849040064; Email: sachin.rautaray@icar.gov.in

Course Co-Coordinators
Dr. Ashok K. Nayak, Principal Scientist, ICAR-IIWM, Bhubaneswar
Dr. Debabrata Sethy, Scientist, ICAR-IIWM, Bhubaneswar

Nomination Form

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IoT Enable Sensing Systems and AI/ML Application in Agricultural Water Management

(Hybrid Mode)
(11-13 November 2024)
Organized by ICAR-IIWM, Bhubaneswar, Odisha
(Nomination deadline: 4th November 2024)

Full Name (in block letters):	
Designation:	
Discipline:	
Date of Birth and Gender:	
Name of the Organization:	
Address:	
Email Id:	
Mobile No:	
Is applicant ICAR employee (Yes/No):	
It is certified that the above information furnished above are correct.	
Signature of the Candidate:	
The particulars given by the candidate are correct and the nomination is recommended.	
Signature of Sponsoring Authority with Seal and date:	