

IN THIS ISSUE



DIRECTOR'S COLUMN



Large Language Models (LLMs) and decision tools for green and climate smart agriculture

Large Language Models (LLMs) are advanced artificial intelligence systems that employ self-supervised machine learning on large datasets to understand, process, and generate information useful for decision-making. ChatGPT is one such LLM and a prominent example of generative Artificial Intelligence (AI). These tools are increasingly being used across diverse domains, including chatbots and virtual assistants, content creation and summarization, translation, code generation and debugging, healthcare diagnostics, personalized education, and advanced data analytics in sectors such as finance and law. In recent years, the application of LLMs has expanded into agricultural water management, where they help process complex datasets, generate actionable insights, and improve communication with farmers. Integrating LLMs with complementary technologies—

such as Internet of Things (IoT)-enabled soil moisture sensors, water quality and quantity monitoring systems, and climate forecasting tools—can optimize water use and enhance agricultural water productivity. Research on agricultural water management in both rainfed and irrigated ecosystems is highly data-intensive. It involves targeting water harvesting structures, quantifying harvestable runoff, and designing irrigation schedules for surface and micro-irrigation systems to improve water and nutrient use efficiencies. Integrated sensing systems are also being standardized for real-time measurement of soil moisture, water volume, and automated irrigation supply as per crop water demand in both open fields and protected environments (poly-houses).

Data generated from such experiments across diverse agro-ecological regions, crops, and irrigation regimes form a strong foundation for developing and training LLMs. These datasets can be combined with various hardware systems such as sensors, Near-Infrared (NIR) and Mid-Infrared (MIR) devices, hyperspectral cameras, check gates, and water measuring instruments. Such integration can facilitate the development of interfaces and decision support systems (DSS) for irrigation scheduling, soil property estimation, automated canal gate operations, identification of small water bodies, water budgeting, and crop water use planning. Moreover, fusion of LLMs with process-based crop and hydrological models can yield intelligent systems accessible via smartphones and laptops, enabling real-time, data-driven decisions for farmers and water managers. Moreover, the LLMs developed in different fields of natural resources management (NRM) need to be validated using the real field data to ascertain its use for predictive support and decision making under changing climate.

During the last six months, the Institute made significant efforts to disseminate ICAR-IIWM technologies and reach wider stakeholder groups through active participation in conferences, farmers' fairs, and capacity-building programs under initiatives such as TCP, SCSP, Farmers FIRST, and MGMT. Several externally funded project proposals were approved, and three technologies were certified by the NRM Division of ICAR. Major institutional activities, including the IRC, ARC, and QRT meetings, were successfully completed, and the QRT report was submitted to the Council on 13th January 2025. The Institute also had the privilege of hosting eminent dignitaries and academicians, including

the DDG (NRM), ICAR; the Development Commissioner and Additional Chief Secretary, DoWR & Planning and Convergence Department, Government of Odisha, Smt. Anu Garg; Directors of ICAR institutes; the Hon'ble Vice Chancellors of OUAT and Sri Sri University; Deans and Heads of OUAT departments; and Chief Engineers from various Government of Odisha departments. In addition, several awareness programmes and outreach initiatives were organized as desired by the Council and the Government of India, reinforcing the Institute's commitment to technology dissemination and capacity enhancement in sustainable agricultural water management.

RESEARCH ACHIEVEMENTS

Subsurface drip irrigation (SSDI) saves water and improves yield in tomato crop

The performance of sub-surface drip irrigation (SSDI) system at different lateral pressure (75 kPa, 100 kPa, 125 kPa and 150 kPa) and depth (10, 15 and 20 cm) was studied in tomato (cv. Arka Samrat) crop at research farm of ICAR-IIWM, Bhubaneswar. Response of the crop pertaining to yield, water use and water productivity (WP) under SSDI was compared with those under surface drip irrigation (SDI) and surface irrigation (SI). It was observed that the SSDI operated at 125 kPa pressure with lateral depth of 15 cm saved 18% and 38% irrigation water compared with SDI and SI, respectively. Moreover, the yield of tomato under SSDI (50.11 t ha^{-1}) was 15% and 33% higher than SDI and SI, respectively. Higher yield with less water use resulted in 34% and 103% increase in WP under SSDI compared with SDI and SI, respectively, in the crop. The highest annual net return (Rs. 368371 ha^{-1}) and benefit-cost ratio (2.57) was generated under SSDI, followed by SDI (net return, Rs. 292490 ha^{-1} ; B-C ratio, 2.27) and SI (net return, Rs. 198047 ha^{-1} ; B-C ratio, 1.69) in tomato cultivation.



Sub-surface drip irrigation (SSDI) in tomato

(P. Panigrahi and S.Pradhan)

Managing Irrigation Systems for Optimizing Water Productivity and Improving Resilience Using Advance Tools (IWMI funded)

Field experiments were conducted in the IIWM Farm, Mendhasal (Derash Canal command), and during kharif- 2024. Rice (cv. Swarna Sub 1) was grown with four establishment methods. i.e. T1: Puddled transplanted rice with continuous flooding (PTR-CF) (Farmer's practice); T2: Puddled transplanted rice with alternate wetting and drying (PTR-AWD); T3: System of rice intensification (SRI) and T4: Direct seeded rice (DSR). For irrigation at alternate wetting drying, an IoT enabled AWD device developed at ICAR-IIWM was used. Measured quantity of water was applied to the field using IoT enabled digital water measuring device. It was observed that maximum grain yield of rice was recorded under SRI method (6087 kg/ha), which was statistically similar to PTR-CF (5187.5 kg/ha) method but significantly higher than PTR-AWD (4800 kg/ha) and DSR method (4512.5 kg/ha) of establishment (Table 1). This was attributes to better crop growth under SRI treatment as evidenced by highest height, length of panicle, number of grains/ panicle and thousand grain weight under SRI treatment. Maximum biomass yield was recorded under SRI method, which was statistically similar to PTR-CF and PTR-AWD methods but significantly higher than DSR method. However, the harvest index was highest under DSR method (0.450), which was similar to SRI method but significantly higher than PTR-CF (0.390) and PTR-AWD (0.368) methods of establishment. The water productivity of rice was highest under SRI method (0.70 kg/m^3), which was statistically similar to DSR (0.57 kg/cm^3) method but significantly higher than PTR-CF (0.50 kg/m^3) and PTR-AWD (0.49 kg/m^3) method of crop establishment. Therefore, SRI method of establishment in conjunction with advanced irrigation management tools has a potential for improvement water productivity rice in canal commands.



Experimental setup for the digital water measuring device

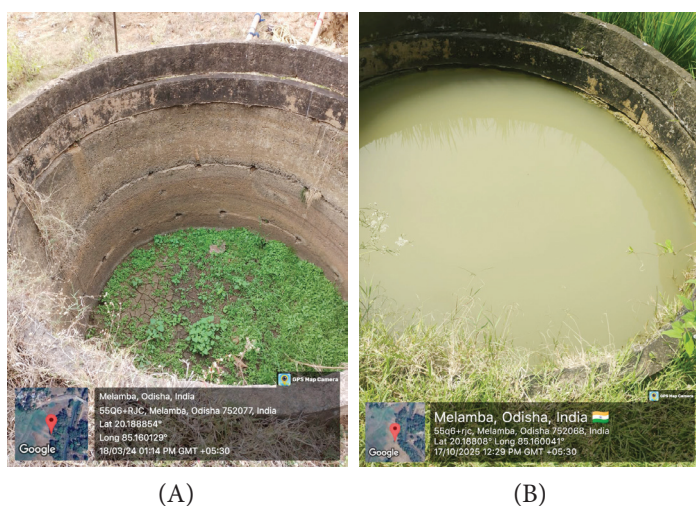
Table 1. Yield and water productivity of rice under different establishment and water management practices

Treatment	Grain yield (kg/ha)	Biomass yield (kg/ha)	Harvest Index	Water use (ER* + Ir) (mm)	Water productivity (kg/m ³)	Plant height (cm)	Length of Panicle (cm)	No. of grains/Panicle	Thousand grain weight (g)
T1: PTR-CF	5187.5 ^{ab}	13358 ^a	0.390 ^{ab}	1036.2	0.50 ^b	85.91 ^a	22.63 ^a	146.85 ^a	19.1 ^{ab}
T2: PTR-AWD	4800 ^{ab}	13050 ^a	0.368 ^b	976.2	0.49 ^b	89.09 ^a	22.56 ^a	149.65 ^a	17.91 ^b
T3: SRI	6087.5 ^a	13813 ^a	0.445 ^a	876.2	0.70 ^a	91.08 ^a	23.56 ^a	153.25 ^a	19.12 ^{ab}
T4: DSR	4512.5 ^b	10100 ^b	0.450 ^a	786.2	0.57 ^{ab}	88.065 ^a	22.78 ^a	148.65 ^a	20.08 ^a
CD(p≤0.05)	994.6	1843	0.053	-	0.10	NS	NS	NS	1.11

(K.K. Bandyopadhyay, R.K. Panda, D. Sethi and A. Sarangi)

Revitalizing traditional dug wells through construction of recharge shafts

Interventions pertaining to construction of groundwater recharge shafts at 100 locations were taken up in Nayagarh and Khandapada blocks of Nayagarh district, Odisha. It was observed that, despite occurrence of about 1550mm average annual rainfall with 70% of precipitation during monsoon season in these regions, there was limited groundwater availability during critical crop growth stages in the rabi season. Therefore, recharge shafts of 6" diameter were installed in the existing dug wells at an average depth of 6 m with perforations and packed with sand and gravel to enhance infiltration and prevent clogging. Hydrological monitoring at 15 days' interval indicated a considerable rise in the water table depth after recharge interventions. Pre-monsoon groundwater levels ranged between 2–6 m below ground level (bgl), while post-monsoon levels improved to 0–4 m bgl, showing the recharge shaft induced rise of about 15 to 30 cm depth in each dug well. Subsequently, the enhanced water availability due to such rise of water table in these dug wells assisted in irrigation of crops during the rabi season.



Depth of water table before (A) and after (B) construction of the recharge shaft in the dugwell located in the Melamba village, Nayagarh, Odisha

(R.R. Sethi, O. P. Verma and D. C. Sahoo)

Assessment of crop water footprint at regional scales using geospatial techniques

Water footprint at district level for the Odisha State was mapped for the rice crop during 2009, 2013, 2017, and 2021 (Fig.1). Different components of the water footprint viz., the green, blue, and grey water footprints were estimated using secondary data and satellite images. Estimation of water footprint of rice in Odisha assumes importance due to coverage of 69% of cultivated land and contributes to about 63% of total food grain productions. Rainfall, temperature, relative humidity, and wind speed were the climatic variables considered in this investigation. The data acquired from satellite images i.e. FLDAS (Relative Humidity) and ERA5 (Temperature, Wind speed), Soil Grids 250m 2.0(Soil textural class) and IMD gridded data of different resolutions were used in the assessment. Datasets were harmonized to generate 0.25°×0.25° grid-wise meteorological, soil and crop databases for each district of Odisha. FAO CROPWAT 8.0 was used to estimate the AET leading to assessment of green and blue water footprint. In 2009, 2013, 2017, and 2021, the total water footprint of crop production ranged from 1238.5 m³/t (Baragarh) to 6451.7 m³/t (Jharsuguda), 717.8m³/t (Nabarangpur) to 6899.0 m³/t (Ganjam), 738.2 m³/t (Nabarangpur) to 5394.5 m³/t (Baragarh), and 769.05m³/t (Nabarangpur) to 5306.16 m³/t (Jharsuguda), respectively. In these years, the blue water footprint varied from 0.01% to 59.51% of the overall water footprint, whereas the green water footprint varied from 62.42% to 99.90%. However, the grey water footprint was extremely small, ranging between 0.01% and 0.42% of the total water footprint. Nonetheless, the study would assist in formulation of policy for crop diversification besides management of water in rice cultivated region of Odisha.

The spatial variation highlights that districts with higher irrigation dependency demonstrated greater blue water footprint, whereas rainfed regions predominantly relied on green water resources. These findings indicate that optimizing irrigation efficiency and adopting water-saving cultivation practices can reduce pressure on freshwater resources. Furthermore, identifying districts with excessive water use can help prioritize interventions such as introduction of low-water-demand crops, improved scheduling of irrigation, and adoption of climate-resilient farming practices. Nonetheless, the study would assist in formulation of policy for crop diversification besides management of water in rice cultivated region of Odisha. The generated baseline information may further serve as a decision-support tool for future planning under changing climatic scenarios.

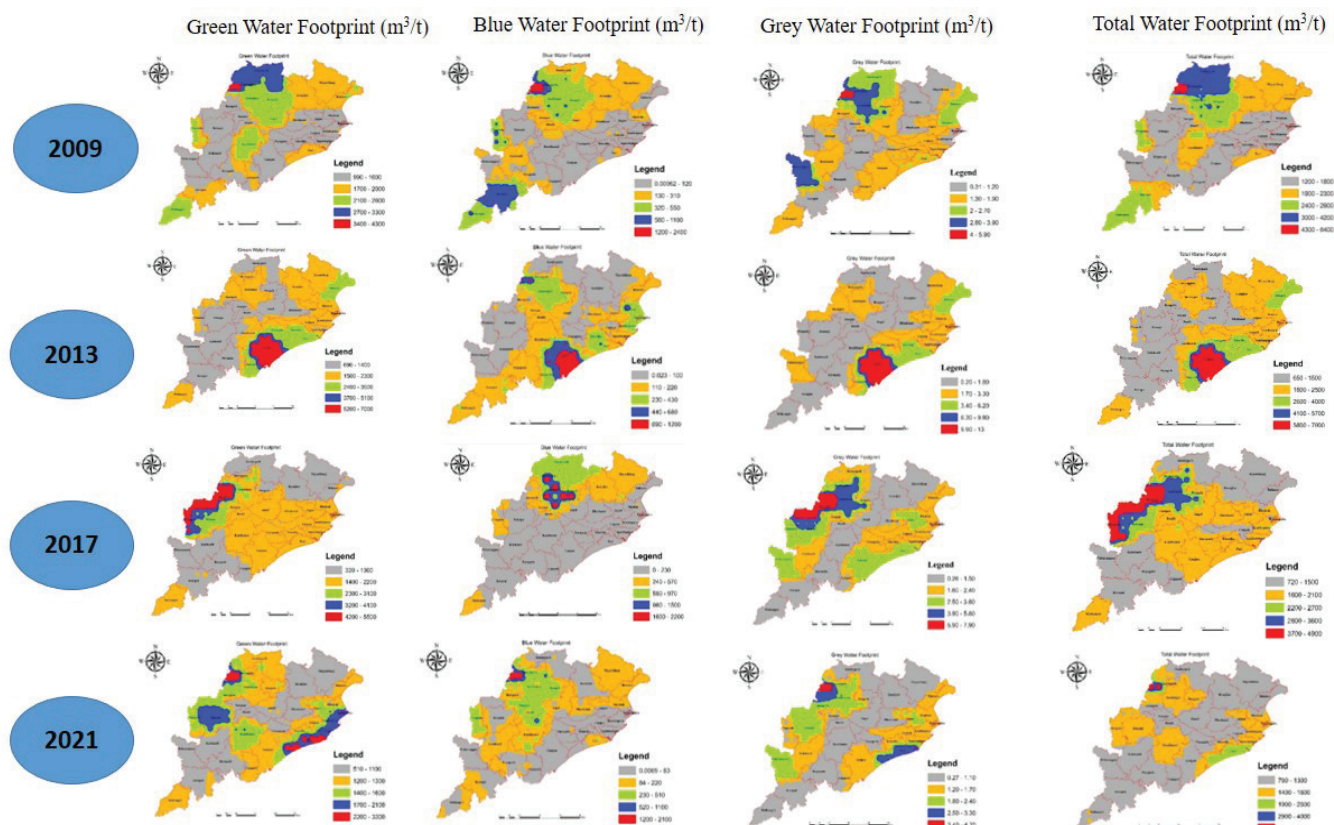


Fig. 1. Green (GWF), Blue (BWF), Grey (GRWF) and total Water Footprint (TWF) map of Odisha for 2009, 2013, 2017 and 2021.

(R.K. Jena, R. R. Sethi, U.K. Pradhan and S. Khedikar)

POLICY PAPERS AND RESEARCH PUBLICATIONS WITH NAAS SCORE > 10

Kumari, A., Singh, D.K., Sarangi, A., Hasan, M., Sehgal V.K. (2024) Optimizing wheat supplementary irrigation: Integrating soil stress and crop water stress index for smart scheduling, Agricultural Water Management, 305: DOI: <https://doi.org/10.1016/j.agwat.2024.109104> (NAAS Score 11.9)

Rajput, J, Singh M., Khanna, M., Sarangi, A., Mukherjee, J., Singh S. Dimple (2024) Development of single and dual crop coefficients for drip-irrigated broccoli using weighing type field lysimeters in semi-arid environment, Environment, Development and

Sustainability: DOI: <https://doi.org/10.1007/s10668-024-05416-5> (NAAS score 10.7)

Panda, R.K., Bandyopadhyay, K.K. and Sarangi, A. (2025) Enhancing Water Productivity in Canal Commands- A Policy Perspective, ICAR-Indian Institute of Water Management, Bhubaneswar, Odisha, India, 1-24 p.

Mohanty, R.K., Ghosh, D., Sarangi, A., 2025. Sustainable Wastewater Reuse in Agriculture and Aquaculture. Policy Paper-003, ICAR-Indian Institute of Water Management, Bhubaneswar, India, 24p.

EVENTS, NEWS & CELEBRATIONS

New Year Celebration 2025

ICAR-IIWM celebrated new year on January 01, 2025 with joy and teamwork. The day started with a speech from Dr A. Sarangi, Director of the Institute, highlighting last year's achievements and setting goals for the next year.

Institute Research Council (IRC) Meeting Organized

The Institute Research Council (IRC) Meeting of ICAR-IIWM, Bhubaneswar was held on January 09, 2025 under the Chairmanship of Dr. A. Sarangi, Director. The externally funded projects, ongoing Institute funded projects were reviewed during the meeting. Dr. P.K. Mishra, former Director, ICAR-IISWC, Dehradun served as an expert member and joined on line and reviewed the progress of research projects and advised on the thematic areas to undertake research at ICAR-IIWM.



Research Advisory Committee Meeting of ICAR-IIWM

The third meeting of 9th Research Advisory Committee (RAC) of ICAR-IIWM was held during February 25-26, 2025. Dr. Alok

Kumar Sikka, IWMI Indian Country Representative and Former DDG (NRM) presided over the meeting as the Chairman, RAC. Dr. A. Velmurugan, ADG (SWM), ICAR and other Members of RAC also attended the RAC Meeting. Initially, Director, ICAR-IIWM welcomed the delegates and made a brief presentation on the achievement of the institute during last one year. This was followed by remarks of Chairman and Members, RAC. Dr. S. Mohanty, Principal Scientist and Member Secretary presented the Action Taken Report on the Recommendations of the last RAC, which was accepted by the house. This was followed by Program level presentation of significant research achievements by respective Program Leaders. On February 26, 2025, Members Dr. B. S. Yadav, Dr. S. K. Pattanaik and Dr. Amit Kar visited the Canal automation Project site at Darpanarayanpur MIP in Nayagad district of Odisha. The Members interacted with farmers and office bearers of Water User Association (WUA).



ICAR-IIWM organized Training Programme

The training and capacity building program titled 'Conjunctive Water Use and Agricultural Water Productivity under Changing Climate' at ICAR-IIWM, Bhubaneswar during February 18-20, 2025. This training program was sponsored by the Ministry of Jal Shakti, Govt. of India. Twenty-four participants from different parts of the country participated in the training program. They registered in this training program using the google form uploaded in the Institute website. Dr. A. Velmurugan, ADG (S&W), Natural Resources Management Division, ICAR, New Delhi was the chief guest in the inaugural function. There were in total 13 lectures by multidisciplinary list of experts covering different aspects related to the theme of the training program as per the schedule. Dr. R.K. Panda, Director, Professor & Director, Centre for Climate Smart Agriculture, Siksha 'O' Anusandhan University was the Chief guest for the valedictory function. Dr. A. Sarangi, Director of ICAR-IIWM was the course Director for this program and the course coordinators were Dr. K.K. Bandyopadhyay, Dr. R.K. Panda and Dr. S. Pradhan.



Farmers-Scientists Interaction cum Field Monitoring Visit

Farmers-Scientists Interaction Meet cum Field Monitoring Visit was held on February 27, 2025 led by Dr. Kalyan Sundar Das, Principal Scientist & Nodal Scientist of FFP, ICAR-ATARI, Kolkata at the adopted village cluster consisting of three tribal dominated villages in the Khordha district. The delegation toured rice and vegetable demonstration plots, dairy and poultry units, vermi compost units, and other farmer managed enterprises. During field interactions, they engaged directly with over fifty





participating farmers and farm women to evaluate the progress of various initiatives. As part of the recognition ceremony, ten progressive farmers and farm women were felicitated by the Nodal Scientist for their exemplary contributions. The program was coordinated by Dr. S.K. Mishra.

ICAR-IIWM celebrated Republic Day

The 75th Republic Day was celebrated on January 26, 2025, with great enthusiasm. Dr. A. Sarangi, the institute's Director, hoisted the national flag. He addressed the staff and their families, encouraging them to work hard and stay dedicated for the welfare of the farming community and to bring pride to the institute and the country.



ICAR-IIWM observed 'World Water Day 2025'

ICAR-IIWM celebrated World Water Day 2025 with the theme 'Glacier Preservation' on March 22, 2025. The chief guest of the event was Dr. A.K. Nayak, Director, ICAR-CRRI, Cuttack and Guests of Honours were Dr. A. Velmurugan, ADG (SWM), NRM, ICAR and Dr. B.K. Sahoo, Regional Director, CGWB, SER, Bhubaneswar; Er. Padma Dorje, Chief Engineer, POMIO, Central Water Commission, New Delhi delivered the World Water Day lecture. The chief guest emphasized on climate change which causes glacier melt down which ultimately due to greenhouse gas emissions from unsustainable agricultural practices. The future research should focus on preservation of water resources in terms of quality and quantity in line with achieving sustainable developmental goals. On the occasion, ICAR-IIWM's publications were released by the dignitaries. Five nos. of Progressive farmers from the adopted villages were awarded for their significant achievements in agricultural water management and the school students were awarded for their speech on world water day.



ICAR-IIWM organized National Brainstorming Session

ICAR-IIWM conducted a National Brainstorming Workshop on 'Groundwater and the water-food-energy nexus- Challenges and Opportunities' on March 22, 2025. Dr. A.K. Nayak, Director, ICAR-Central Rice Research Institute, Cuttack was the Chief guest on this occasion. The guests of honour were Dr. A. Velmurugan, ADG (SWM), ICAR, New Delhi, Dr. B.K. Sahoo, Regional Director, CGWB, SER, Bhubaneswar and Er. Padma Dorjee, Chief Engineer, POMIO, CWC, New Delhi. Total 19 keynote speakers delivered their lecture under the themes namely

groundwater status and management, conjunctive and sustainable groundwater utilization for enhancing agricultural water productivity, groundwater-food-energy nexus and groundwater quality, water governance and policy. Experts from ICAR-IIWM, ICAR-NIAP, International Water Management Institute (IWMI), Indian Institute of Science (IISc), Indian Institute of Technology (IIT, Kharagpur & IIT, Guwahati), Central Ground Water Board (CGWB), North Eastern Regional Institute of Water and Land Management (NERIWALM), State Agricultural Universities (SAUs) like OUAT, MPKV, PAU, TNAU, JAU joined in this event. The four themes under this brain storming session were viz., (i) Groundwater Status and Management in different regions of India; (ii) Conjunctive and Sustainable Groundwater Utilization for Enhancing Agricultural Water Productivity; (iii) Groundwater-Food-Energy Nexus and (iv) Groundwater Quality, Water Governance & Policy.



Rice Field Days cum Crop Cutting Experiments Conducted

Three rice field days and ten crop-cutting experiments were conducted during May 12-16, 2025 conducted in adopted villages of Haridamada and Barapita, Khordha district. The average fresh grain yields recorded were highly promising 'Binadhan 11' produced in an average 6.80 t/ha under non-submerged conditions, while 'CR Dhan 206' yielded in an average 6.44 t/ha. These varieties outperformed the local popular check variety 'Mamata', which yielded only 5.28 t/ha under similar growing conditions.



Farmers and resource persons during the crop cutting experiment of Binadhan 11 paddy variety



Farmers and resource persons during the second crop cutting of CR Dhan 206 paddy variety

Scientists of ICAR-IIWM participated in Viksit Krishi Sankalp Abhiyan (VKSA)

Under the exemplary leadership of Prime Minister Shri Narendra Modi, aimed at enhancing agricultural status for a Developed India (*Viksit Bharat*) by 2047, the Union Minister of Agriculture and Farmers Welfare, Shri Shivraj Singh Chouhan Ji inaugurated the *Viksit Krishi Sankalp Abhiyan* (VKSA) – 2025 on 29 May 2025 at Sakhigopal, Puri, Odisha. The goal of this 15-day Country wide pre-kharif agricultural campaign was to bridge the knowledge gap between grassroots farming and scientific research. During this campaign scientists from ICAR-Indian Institute of Water Management in collaboration with KVKs and line departments of Government of Odisha organized the campaign with 180 VKSA Interaction meetings benefiting 81,141 farmers and farmwomen from all blocks of three districts (viz. Balasore, Ganjam and Nayagarh) of Odisha. Throughout this campaign, all teams informed farmers about various agricultural schemes introduced by both the Central and State Governments, disseminated diverse technologies and techniques to enhance productivity, profitability, and sustainability, and gathered information concerning major farmer concerns, innovative practices employed by farmers, and grassroots-level feedback to inform future agricultural research, with particular emphasis on location-specific requirements and the effective dissemination of different technologies. Nine '*Krishi Rath*s' (three in each district) fitted with A-V aids along with team of scientists disseminated pertinent agricultural information and pertinent technologies to stakeholders.



Glimpses of VKSA Interaction meetings including participation of VVIPs, distribution of soil health cards and moving of *Krishi Rath*s across the districts

ICAR-IIWM celebrated 38th Foundation Day

ICAR-Indian Institute of Water Management (IIWM), Bhubaneswar celebrated its 38th Foundation Day on 13th May, 2025. Inaugurating the event as Chief Guest, Mrs. Anu Garg, Development Commissioner and Additional Chief Secretary, Govt. of Odisha mentioned that water scarcity is emerging severely at all levels, be it global or national or regional. In spite of our best efforts, the water use efficiency of the Country is not crossing 40% and there is need to increase it to 60% through development of appropriate technologies and augmenting their adoption. Guest of Honour, Dr. A.K. Nayak, Deputy Director General (NRM) informed that in Foundation Day we should analyze our past achievements and future responsibility. Water harvesting and its conservation, judicious use and enhancing the use efficiency should be the driving force. Dr Nayak also informed that the climate change induced rainfall abnormalities; ground water depletion and high volume of waste water generation are posing serious challenges to the scientists. Prof. Tej Partap, Vice Chancellor, SRI SRI University, Cuttack in his foundation day lecture stressed the need of sustainable water management approach comprising various stakeholders such as policy framers, scientists and farmers. Dr. A. Sarangi, Director of the Institute welcomed all guests and made a brief presentation on the water saving technologies developed by ICAR-IIWM. On this occasion, 11 progressive farmers from various parts of the State were honoured and felicitated. Two policy papers and a total of 7 publications besides a mobile app on Agricultural Water Management (AWM) was released by the dignitaries. To make the foundation day special, agriculture exhibition and scientists farmers interaction meeting were organized. Directors of ICAR institutes, Heads of regional centers, officers from state departments and central governments, scientists and farmers attended the event both physically and in virtual mode. Dr. R.K. Panda, Principal Scientist of the institute proposed vote of thanks.



Farmers' Exposure Visit programme organized

- A farmer exposure visit programme was organized on January 2, 2025 in which 21 farmers and 02 officers from BCT-Krishi Vigyana Kendra, Visakhapatnam, Andhra Pradesh were exposed to various experimental plots and demonstration units including technology park, hydroponic-based vertical farming, soilless dragon fruit, etc. inside the campus. Dr. S.K. Mishra and Dr. P. Sahu coordinated the exposure visits.

- One exposure cum training programme was organized on January 17, 2025 with participation of 63 farmers and 03 officers from Niali, Salepur and Nischintakoili blocks of Cuttack district. The programme was sponsored by the Deputy Director of Horticulture (DDH), Cuttack under the MIDH Scheme. Dr. S.K. Mishra, Dr. R.K. Jena and Dr. P. Sahu coordinated the event.
- A farmer exposure visit cum training programme was organized on June 9, 2025 in which 31 farmers and 05 officers from Jharkhand were exposed to various experimental plots and demonstration units including Technology Park, hydroponic-based vertical farming, soilless dragon fruit, etc. inside the campus. The programme was sponsored by ATMA, Ranchi, and coordinated by the 'Kalyan Bharati' NGO of Ranchi, Jharkhand. Dr. R.K. Mohanty and Dr. S.K. Mishra coordinated the exposure visits.



Farmers Exposure visit from Cuttack district, Odisha

Students' Exposure Visit programme organized

- Under the All India Study Tour, a group of 31 nos. 4th year under graduate B.Sc. (Ag) students from College of Agriculture (CAU-I), Meghalaya along with 02 faculties visited our Institute on February 03, 2025. They were exposed to various IIWM technologies demonstrated in the Technology Park of the Institute including soil-less dragon fruit experimental fields, hydro-ponics and aqua-ponics systems in the poly house. The programme was coordinated by Dr. S.K. Mishra, Dr. Pratiba Sahu and Dr. Debabrata Sethi.

- Under the All India Study Tour, a group of 43 nos. 4th year under graduate B.Sc. (Hort.) students from the College of Horticulture & Forestry, Arunachal Pradesh under CAU along with 02 faculties visited our Institute on February 03, 2025. They were exposed to various IIWM technologies demonstrated in the Technology Park of the Institute including soil-less dragon fruit experimental fields, hydro-ponic and aqua-ponic systems in the poly house. The programme was coordinated by Dr. S.K. Mishra, Dr. Pratiba Sahu and Dr. Debabrata Sethi
- A group of 21 nos. 4th year under graduate students from the Faculty of Agriculture of Sri Sri University, Cuttack along with 02 faculties visited our Institute on March 10, 2025. They were exposed to various IIWM technologies demonstrated in the Technology Park of the Institute including aquaponic lettuce inside poly house. The programme was coordinated by Dr. S.K. Mishra and Dr. D. Sethi.
- Under the All India Study Tour, a group of 47 nos. 3rd year under graduate B.Sc. (Ag) students from BTC College of Agriculture and Research Station, Sarkanda, Bilaspur, Chhattisgarh (under IGKV, Raipur) along with 03 faculties visited our Institute on June 25, 2025. They were exposed to various IIWM technologies demonstrated in the Technology Park of the Institute including hydro-ponic and aqua-ponic systems in the poly house. The programme was coordinated by Dr. S.K. Mishra, Dr. S. Mohanty, Dr. D.K. Panda, Dr. H.K. Dash, Er. A.K. Nayak and Dr. P. Sahu.



All India Study Tour of students from the College of Horticulture & Forestry, Arunachal Pradesh



All India Study Tour students from College of Agriculture (CAU-I), Meghalaya

ICAR-IIWM Participated in Agricultural Exhibitions

Sl. No.	Event	Place	Date
1	National Conference on 'Seed Chain Management in Eastern & North Eastern Hill Region: Challenges and Opportunities'	ICAR-IIHR-CHES, Bhubaneswar	January 21-22, 2025
2	State level Agriculture Fair - 'Krushi Odisha 2025'	Baramunda, Bhubaneswar	January 03-05, 2025
3	Kisan Mela and Exhibition on Freshwater Aquaculture	ICAR-CIFA, Bhubaneswar	January 29, 2025
4	'Eastern Zone Regional Agriculture Fair 2025'	ICAR-CRRI, Cuttack	February 27- March 01, 2025
5	3 rd Utkal Krishi Mela 2025	CUTM, Paralakhemundi, Gajapati	April 7-8, 2025
6	38 th Foundation Day of ICAR-IIWM	ICAR-IIWM, Bhubaneswar	May 13, 2025
7	National Seminar 2025 on 'Extension Education Strategies and Digital Agriculture: Experiences and Sustainable Pathways'	OUAT, Bhubaneswar	June 20-22, 2025



Participation ICAR-IIWM in the Exhibition at 'Krushi Odisha', Bhubaneswar

Training/program organized for the farmers

Sl. No	Subject	Place	Period	Participants
1	Training programme on 'Advances in agricultural water management technologies in horticultural crops' for farmers from Niali, Salepur and Nischintakoili blocks of Cuttack district under the MIDH Scheme.	ICAR-IIWM, Bhubaneswar	January 17, 2025	66
2	Training cum demonstration programme on 'Improved Oyster Mushroom Cultivation Practices for Increasing Additional Family Income and Nutritional Security' for farmers from Haridamada, Jamujhari & Barapita villages of Khordha, Odisha	Haridamada, Khordha	January 20, 2025	50
3	Field day program on 'Groundwater recharge impact on agriculture' under RKVY-GWR	Gopalipada, Khandapada	January 23, 2025	109
4	Training cum awareness program on 'Importance of groundwater recharge structures on agriculture' under RKVY-GWR.	Raghunathpur, Khandapada	February 14, 2025	156
5	Farmer's exposure visit program	ICAR-IIWM, Bhubaneswar	February 21, 2025	50
6	Training cum demonstration programme on 'Crop Protection Measures in Field and Horticultural Crops' for farmers from Haridamada, Jamujhari & Barapita villages of Khordha, Odisha	Haridamada, Khordha	March 18, 2025	60
7	One day Farmer's training cum demonstration program on 'Impact of groundwater recharge on crop and water productivity' under RKVY-GWR	Kusumitara, Khandapada	March 19, 2025	159

8	One day Farmer's training under TSP	Chougaon, Koraput	April 23, 2025	104
9	One day Farmer's training under TSP	Charagaon, Koraput	April 24, 2025	97
10	Training programme on 'Advances in agricultural water management technologies in field and horticultural crops' for farmers from Jharkhand sponsored by ATMA, Ranchi, and coordinated by the 'Kalyan Bharati' NGO of Ranchi, Jharkhand.	ICAR-IIWM, Bhubaneswar	June 09, 2025	36



Programme conducted under Institute SCSP

Sl. No.	Date	Location	Programme	Participants	Topic/ Inputs distributed
1	January 2, 2025	Chanrapada village, Nimapada block, Puri	Input distribution	Total=64 Female=30	Kitchen Garden Kit
2	January 03, 2025	Champapur village, Salipur block, Cuttack	Interaction meeting	Total=16 Female=0	Agricultural water management
3	January 03, 2025	Makundapur village, Salipur block, Cuttack	Input distribution program	Total=52 Female=07	Black gram and green gram
4	January 16, 2025	Garedi panchan village, Balipatna block, Khordha	Input distribution program	Total =39 Female=24	Black gram, green gram and Rhizobium
5	January 23, 2025	Belera village, Salipur block, Cuttack	Training and input distribution	Total = 46 Female=37	Oyster Mushroom Seeds and Polythene
6	January 23, 2025	Champapur village, Salipur block, Cuttack	Training	Total= 69 Female=29	Crop diversification
7	January 28, 2025	Kathapala village, Gondia block, Dhenkanal	Training	Total= 62 Female=28	Crop diversification
8	January 30, 2025	Belera, Champapur, Makundapur, villages, Salipur block, Cuttack	Exposure visit	Total=30 Female=12	ICAR-CHES, ICAR-CTCRI and ICAR-IIWM
9	February 13, 2025	Bhatabandha, Chanrapada, Hansapada and Murudi villages, Nimapada block, Puri.	Exposure visit	Total= 28 Female=17	ICAR-CHES, ICAR-CTCRI and ICAR-IIWM
10	February 14, 2025	Dihabari, Garedipanchan, Villigram villages, Nimapada and Balipatna block, Puri	Exposure visit	Total= 31 Female=03	ICAR-CHES, ICAR-CTCRI and ICAR-IIWM
11	February 14, 2025	Garedipanchan village of Balipatna block, Khordha	Training	Total= 44 Female=09	Paddy Straw Mushroom Seeds and Polythene

12	April 04, 2025	Belera village, Salipur block, Cuttack	Input distribution	Total=15 Female=0	Power thresher, Spade, Power Sprayer etc.
13	April 08, 2025	Garedipanchan village, Balipatna block, Khordha	Input distribution	Total=36 Female=15	Power Thresher, Spade and Power Sprayer
14	April 08, 2025	Nijogokasoti village, Nimapada block, Puri	Input distribution	Total=13 Female=08	Power Thresher and Spade
15	April 25, 2025	Belera village, Salipur block, Cuttack	Interaction meeting	Total=23	Power Thresher and Spade
16	April 25, 2025	Makundapur village of Salipur block, Cuttack	Interaction meeting and input distribution	Total= 42 Female=17	Power Thresher and Spade
17	April 25, 2025	Champapur village of Salipur block, Cuttack	Interaction meeting and input distribution	Total=16 Female=0	Power Thresher and Spade
18	May 22, 2025	Nuagaon village, Dhenkanal district	Interaction meeting and input distribution	Total=15 Female=05	Knapsack Sprayer, Nano DAP etc.
19	June 02, 2025	Balara village, Kakatpur block, Puri	Interaction meeting	Total= 34 Female=19	Agricultural Water management
20	June 04, 2025	Makundapur village, Salipur block, Cuttack	Interaction meeting and input distribution	Total=31 Female=09	Water tank, Barbed wire, Brush cutter, Earth auger, Power Sprayer etc.
21	June 04, 2025	Belera village, Salipur block, Cuttack	Interaction meeting and input distribution	Total= 31 Female=09	Water tank, Barbed wire, Power Sprayer, Tarpaulin Mat etc.,
22	June 05, 2025	Parichanrapada village, Nimapadar block, Puri	World Environment Day programme	Total =86 Female=59	World Environment Day celebration
23	June 10, 2025	Makundapur village, Salipur block, Cuttack	Interaction meeting and input distribution	Total= 56 Female= 08	Paddy seeds
24	June 10, 2025	Belera village, Salipur block, Cuttack	Interaction meeting and input distribution	Total=51 Female=0	Paddy seeds

Activities Under TSP

Farmer's interaction meet was organized in newly adopted villages Chaugaon (Block: Koraput and G.P: Padmapur) and Chargaon (Block: Semiliguda and G.P: Pitaguda) in Koraput district and the tribal farmers were briefed about the objectives of the TSP project. Based on the recommendations of the ward members of both the villages, the tribal farmers were provided with threshing mats (100 nos.), cycle weeders (100 nos.), mandua weeders (100 nos.) and garden irrigation water pipes (150 rolls, each of 30m length).

Factory visit and verification of micro-irrigation companies

Dr. S. Mohanty and Dr. P. Panigrahi, Principal Scientists were nominated for factory visit and verification of micro-irrigation companies. In this connection Dr. S. Mohanty visited Balasore on April 23, 2025 and Dr. P. Panigrahi visited Solapur during April 29, 2025 to May 01, 2025.

ICAR-IIWM Celebrated International Day of Yoga (IDY)

The 11th International Yoga Day, themed 'Yoga for Self and Society' was celebrated at the Institute on June 21, 2025. Dr. A. Sarangi, Director, inaugurated the event, emphasizing the importance of mental and physical fitness for enhancing productivity and work efficiency. Yoga Guru Shri Manoj Kumar Rout stressed the



benefits of yoga for all age groups, from school children to retirees, to maintain overall health. The event included a yoga practice session where staff, scholars, and family members performed various Asanas and Pranayams. Dr. S.K. Mishra, Principal Scientist, served as the Convener of the event.

ICAR - IIWM organized Hindi Workshop

A Hindi Workshop was organized at the Institute during January to March 2025. The topic of workshop was 'Official Language Rules and Regulations and Kanthastha Version 2 - a Memory Based Translation Software'. About 10 officers and employees participated in this Hindi Workshop. Sh. Pramod Kumar Nirala, Assistant Director, ESIC, Bhubaneswar, delivered a special lecture in this workshop.



ICAR - IIWM conducted Quarterly meeting on Rajbhasha Hindi

Departmental Official Language Implementation Committee of ICAR - IIWM conducted a review meeting once in every quarter

ICAR-IIWM Signed MoU

Sl. No.	Name of the Institutions	Date of Signing	Brief Description	Signed by	Valid upto
1.	M/s. Forech Mining & Constructions International LLP, Hilton House, New Delhi	January 06, 2025	Production and supply of Technical textile reinforced rubber composite sheets for installation of 'ICAR Flexi check dams'	Director, M/s. Forech Mining & Constructions International LLP and Director, ICAR-CIRCOT	Valid for 3 years

Webinar / Programs / Virtual Meetings Attended by Scientists

Sl. No.	Official	Name of the conference/ meetings/ workshop/ symposium/ seminar	Organized by	Period
1	Dr. S. K. Jena, Dr. K. K. Bandyopadhyay	Foreign aided project review meeting	ICAR-RCER, Patna	January 04-05, 2025
2	Dr. S. K. Jena, Dr. K.K. Bandyopadhyay	State level technical committee meeting for review of consultancy project on ecosystem services	DSCWD, Krishi Bhawan, BBSR	January 07, 2025
3	Dr. S. K. Jena	Golden Jubilee celebration	ICAR- RC NEHR, Barapani, Meghalaya	January 9-10 2025
4	Dr. R. K. Panda	Final QRT review meeting	ICAR, New Delhi	January 13, 2025
5	Dr. S. K. Jena, Dr. D.C. Sahoo	National Workshop on 'Advance & Applications of Crop Models for Climate smart Agriculture'	Skisha O Anusandhan, BBSR	January 16, 2025
6	Dr. S. K. Jena	International Conference on 'Sustainable Food - Water -Energy - Mechanization -Nexus and Whole Grain'	TNAU, Kumulur, Tamil Nadu	January 27-28, 2025
7	Dr. S. K. Jena	2 nd International Conference on 'Rainfed Agriculture: Building Pathways for Resilience & Sustainable Livelihoods'	ICAR-CRIDA, Hyderabad	January 29-31, 2025
8	Dr. S. K. Jena	Training program on 'Women Empowerment through Climate - Resilient Agricultural Technologies for Sustainable Food Systems'	ICAR-CIWA, BBSR collaboration with MANAGE, Hyderabad	February 03-07, 2025
9	Dr. S. K. Jena	4 th National Level Technical Committee (NLTC) meeting	NASC, Delhi	February 17, 2025
10	Dr. R. K. Panda, Dr. S. K. Jena, Er. Ashis Jadhav	Training on 'Conjunctive Water use and Agricultural Productivity' by Ministry of Jal Shakti	ICAR-IIWM, BBSR	February 18-20, 2025
11	Dr. Ankita Jha	XVII NAAS Agricultural Science Congress on 'Frontier Sciences and Technologies in Agriculture'	G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, India.	February 20-22, 2025

and four times in a year, under which necessary guidelines were given for the progress of official language Hindi. Section 3/3, correspondence in Hindi, reply to letters received in Hindi, Hindi training and annual program etc. were discussed in the meeting conducted on May 1, 2025.

ICAR - IIWM organized Hindi Workshop

A Hindi workshop was organized at the Institute on May 16, 2025 (April to June), on Official Language Hindi: Rules and Regulations, Hindi training, and; Noting and Drafting for official works. Approximately 13 officials and employees participated in the Hindi workshop. An invited lecture was delivered by Sh. Ram Dayal Sharma, Joint Director (Official Language), Indian Council of Agricultural Research, New Delhi.

12	Dr. S.K. Mishra, Dr. B.S. Satapathy, Dr. P. Sahu, Dr. S. Mohanty, Dr. H.K. Dash, Dr. R.K. Jena, Dr. D. Sethi	Zonal Review Workshop of Farmer FIRST Programme (Virtual)	ICAR-ATARI, Kolkata	February 21, 2025
13	Dr. S. Pradhan	Training program on 'Introduction to Carbon Neutral Assessment'	Kerala State Council for Science Technology and Environment, Thriuvananthapuram	February 24-25, 2025
14	Dr. S. K. Jena	14 th National Symposium on Coastal Agriculture (NSCA 2025): 'Harnessing Fragile Coastal Ecosystem for Food and Environmental Security'	ICAR-CRIJAF, Barrackpore, West Bengal	February 28-March 3, 2025
15	Dr. S. K. Rautaray, Dr. O. P. Verma, Dr. B. S Satapathy	National Seminar on 'Resource management for climate resilience sustainable food production system'	Indian Society of Agronomy (Odisha Chapter) OUAT, BBSR	March 6-7, 2025
16	Dr. Ashis Maity, Dr. Prativa Sahu	Global conference on 'Innovation to Impact: Gender transformative approach for sustainable Agri-food system'	RAGA & ICAR-CIWA, BBSR	March 8-10, 2025
17	All Scientists	Celebration of World Water day	ICAR-IIWM, BBSR	March 22, 2025
18	Dr. R. K. Panda	Visit of Engineers Team from DoWR, Tamil Nadu to Darpanarayanpur, Nayagarh	ICAR-IIWM, BBSR	April 11, 2025
19	Dr. D. K. Panda	Brainstorming workshop for the collaborative project on 'Integrated Resource Management for Ecological Restoration of Iron Ore Mining-Affected Areas in Keonjhar District, Odisha'	ICAR-IIWM, BBSR	April 24, 2025
20	Dr. S.K. Mishra, Dr. B.S. Satapathy	Rice Field Days and Crop Cutting Experiment program under Farmer FIRST	Haridamada, Khordha	May 12-16, 2025
21	All Scientists	Celebration of 38 th Foundation Day	ICAR-IIWM, BBSR	May 13, 2025
22	Dr. D. C. Sahoo	Meeting on finalization of draft National Technical Guidelines (NTG) for improved watershed management	National Rainfed Area Authority at Krishi Bhawan, BBSR	May 21, 2025
23	Dr. R. K. Panda, Dr. K.K. Bandyopadhyay	State level workshop meeting for launch of CGIAR climate action science	IWMI, New Delhi at BBSR	May 14, 2025
24	Dr. K.K. Bandyopadhyay	Review meeting of IWMI-MIS Project	ICAR-IIWM, BBSR	May 15, 2025
25	Dr. R. K. Panda	Bureau of Indian Standard on 'Surface and sub-surface drainage system review meeting (8 th meeting of FAD 17/Panel 3)'	ICAR-IIWM, BBSR	May 27, 2025
26	All Scientists	Celebration of World Environment day	ICAR-IIWM, BBSR	June 5, 2025
27	Dr. R. K. Panda	Interstate Farmers exposure visit from Jharkhand	ICAR-IIWM, BBSR	June 9, 2025
28	Dr. R. K. Panda	Akhila Odisha Sanyukta Hindi Karyasala	Institute of Physics, BBSR	June 11, 2025
29	Er. Ajit Kumar Nayak	ICID-CIID, Platinum Jubilee	ICID, New Delhi	June 24-25, 2025
30	Dr. K.K. Bandyopadhyay	XXXIV Management Development Programme on Leadership Development (a Pre-RMP Programme)	ICAR-NAARM, Hyderabad	June 16-27, 2025

AWARDS, HONOURS & RECOGNITIONS

- Dr A. Sarangi delivered invited talk on 'Frontier Technologies for Weather and Climate Based Decisions in Agricultural Water Management – An Overview' in the National Conference on AGMET-2025 at AAU, Jorhat on January 13, 2025.
- Dr A. Sarangi delivered a lead talk on 'Crop modelling – A tool and approach for climate resilient Agriculture' during the National Workshop on Advances and Applications of Crop Models for Climate Smart Agriculture, SOA, Bhubaneswar, Odisha on January 16, 2025.
- Dr A. Sarangi delivered a lead talk on 'Water Management Options in Coastal ecosystems– An Overview' in the National Seminar on technological innovations for transforming agriculture- The role of agro-physics on January 24, 2025.
- Dr A. Sarangi delivered a lead talk on 'Precision Agriculture for Sustainable Agri-food System' during the Global Conference on 'Innovations to Impact: Gender Transformative Approach for Sustainable Agri-food System' on March 09, 2025 organized at ICAR-CIWA.
- Dr A. Sarangi delivered a lead talk on 'Integrated Sensing Systems for Enhancing Agricultural Water Productivity- An Overview' during the National Seminar on 'Resource Management for Climate Resilient Sustainable food production on May 07, 2025.
- Dr B. S. Satpathy delivered a talk as guest speaker on 'Soil health, nutrient, disease and pest management in organic farming' at the office of Chief District Agricultural Officer, Jagatsingpur, Odisha on January 02, 2025.
- Dr. P. Sahu delivered lecture as resource person on 'Digital farming Techniques, Hydroponic-based vertical Farming, Precision Agriculture' in residential Capacity Building Program on 'Gender Sensitive Nutri-Smart Organic Agri-Practices and digital Innovations for profitable Agri-preneurship held during January 6-8, 2025 at ICAR-CIWA, Bhubaneswar.
- Dr. P. Sahu served as member of Technical Committee and Rapporteur of National Conference on 'Seed Chain Management in Eastern & North Eastern Hill Region: Challenges and Opportunities' at ICAR-IIHR-CHES, Bhubaneswar during January 21-22, 2025.
- Dr R. R. Sethi received Odisha Women Award in Odisha Women's Conclave 2024-25 organized by Ever Green Forum on January 27, 2025.
- Dr. S.K. Mishra, Principal Scientists and PI of Farmer FIRST project received the 'Best Presentation Award' during the 'Zonal Review Workshop of Programme' conducted at ICAR-ATARI, Kolkata on February 21, 2025.
- ICAR-IIWM IBFI Project adopted farmer Sri Radhashyam Bishwal of Kanas block in Puri district was honoured with 'IARI Fellow Farmer Award 2025' by Honorable Union Minister for Agriculture and Farmers' Welfare, Govt. India during the 'Pusa Krishi Vigyan Mela' organized at ICAR-IARI, New Delhi during February 22-24, 2025.
- ICAR-IIWM Farmer FIRST Project adopted farm woman Smt. Gitanjali Naik of Jamuda village in Saharpada block of Keonjhar district, Odisha was honoured with the 'IARI Innovative Farmer Award 2025' by Honorable Union Minister for Agriculture and Farmers' Welfare, Govt. India in the 'Pusa Krishi Vigyan Mela' organized at ICAR-IARI, New Delhi during February 22-24, 2025.
- Dr B.S. Satpathy delivered a talk as lead speaker on 'Farming and Cropping System' at the National Workshop/Seminar on Innovation in regenerative Agriculture for higher Production and Profitability at ICAR-NRRI Cuttack on February 27, 2025.
- Dr. R.K. Jena delivered a lead talk on Soil Survey and its advancement using Geospatial techniques in the Workshop on 'Agroforestry for Carbon Markets: Unlocking Economical Value through Ecosystem Services' held at OUAT, Bhubaneswar on February 27, 2025.
- Dr B.S. Satpathy participated as an expert member in the Kishan Gosthi at the National Workshop /Seminar on Innovation in regenerative Agriculture for higher Production and Profitability at ICAR-NRRI Cuttack on February 27, 2025.
- Dr. P.K. Panda delivered a lead talk on 'Smart Water and Nutrient Management Practices to Enhance Productivity and Farm Profit' in the National Seminar on Management for Climate Resilient Sustainable Food Production System at OUAT, Bhubaneswar on March 7, 2025.
- Dr. P. Sahu awarded with BEST ORAL presentation entitled 'Effect of liquid fertilizer and aquaponics system on different types of lettuce in hydroponic-based vertical farming system' in Global Conference: 'Innovation to Impact' held at ICAR-CIWA, Bhubaneswar during March 8-10, 2025.
- Dr. P.K. Panda acted as Chief speaker on Golden Jubilee celebration of PM Shri Panchasakha High School, Kamakhyanagar, Dhenkanal, Odisha on April 27, 2025.
- Dr P. Panigrahi, Dr. S. Pradhan, and Dr. A. Sarangi received R C Patra Memorial Award of Institution of Engineers (India), Odisha State Centre on May 11, 2025.
- Dr. P.K. Panda acted as Chief Speaker on June 5, 2025 (World Environment Day) at Chandradeipur, Pipili organized by Pipili Sankrutika Parishad.
- Dr. K.K. Bandyopadhyay delivered a talk on 'Ban on single use of plastic' on the World Environment Day at ICAR-IIWM on June, 5, 2025.

TV/Radio programmes

- Dr. S.K. Mishra, Principal Scientist & Nodal Officer, VKSA Programme delivered a radio talk on Viksit Krushi Sankalp Abhiyan, which was aired by All India Radio, Berhampur on June 01, 2025.
- Dr. B.S. Satapathy, Senior Scientist & Team Leader (Ganjam-A), VKSA Team delivered a radio talk on 'Modern Farming Technologies for Kharif Crops' during Viksit Krushi Sankalp Abhiyan, which was aired by All India Radio, Berhampur on June 03, 2025.

- Dr. A. Maity, Principal Scientist & Team Leader (Ganjam-B), VKSA Team delivered a radio talk on Viksit Krushi Sankalp Abhiyan, which was aired by All India Radio, Berhampur on June 12, 2025.
- Dr P. Sahu, Scientist delivered an expert talk on 'Importance of Horticulture in Viksit Krishi Sankalp Abhiyan' at All India Radio, Puri on June 08, 2025.
- Dr A. Sarangi and Dr P.K. Panda delivered expert talk related to prevention of pollution of soil and water resources and about VKSA (Vikasit Krishi Sankalp Abhiyan) on 5th June 2025 on world environment day, aired by All India radio, Puri, Odisha.



Adopted farmer Sri Radhashyam Bishwal receiving the "IARI Fellow Farmer Award 2025"



Adopted farmer Smt. Gitanjali Naik receiving the "IARI Innovative Farmer Award 2025"



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