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Annual Report

INTERNATIONAL CENTRE FOR CLEAN WATER

AN INITIATIVE OF IIT MADRAS

Where science, innovation, and communities come together to secure clean water.

ICCW

2025

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ABOUT US

The International Centre for Clean Water (ICCW), an initiative of IIT Madras, is a pioneering institution dedicated to addressing complex water challenges through science-driven innovation, interdisciplinary research, and collaborative action. ICCW serves as a national and global platform for developing sustainable water solutions that strengthen water security and environmental resilience.

ICCW brings together scientists, engineers, social researchers, policymakers, and industry partners to design scalable and deployable water solutions. Our work spans water quality assessment, wastewater treatment, resource recovery, and ecosystem restoration, with a strong focus on translating research into real-world impact. By aligning innovation with community needs and national priorities, ICCW contributes meaningfully to India's sustainable development goals.Through world-class infrastructure and expertise, ICCW supports government bodies, academic institutions, industries, start-ups, NGOs, and communities. Our work includes water research, testing and validation, data-driven analysis, technology deployment, stakeholder engagement, and capacity-building initiatives aimed at strengthening water stewardship and long-term sustainability.

Welcome

Reflecting on 2025, ICCW remains committed to advancing clean and safe water through innovation and collaboration.

MISSION

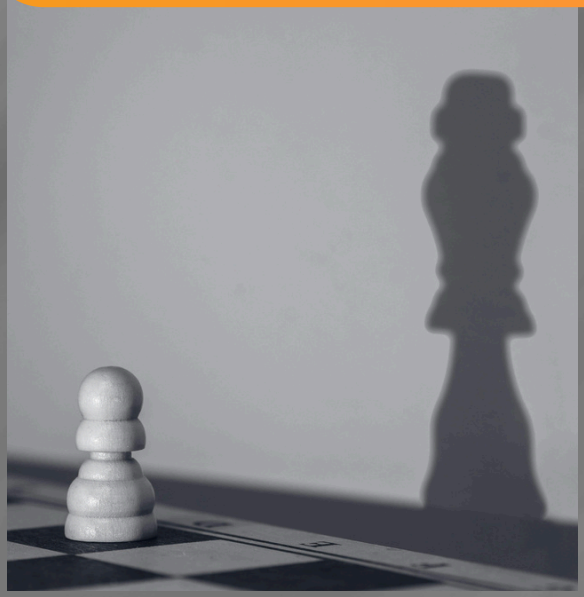
CREATING SUSTAINABLE POSITIVE IMPACT THROUGH CLEAN WATER

ICCW is focused on creating a positive impact in the social, environmental and ecological space through development of technologies in-house, nurturing, validating and translating those developed elsewhere with stakeholder participation.

ICCW also conducts impact assessment of its own work as well as offers impact assessment as a service

VISION

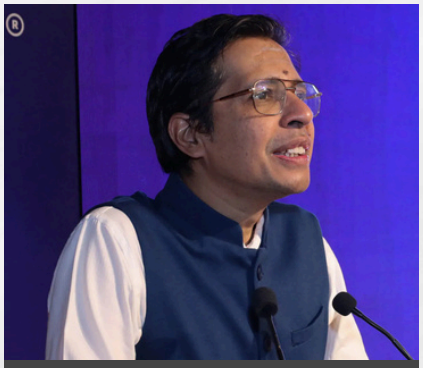
IDEATE , NURTURE AND TRANSLATE DISRUPTIVE TECHNOLOGIES FOR CLEAN WATER WITH STAKEHOLDER PARTICIPATION



Water sustains life, and every intervention in its management affects multiple stakeholders, often with long-term consequences. Solutions that lack a holistic view can create challenges that surface years later.

Recognizing this, ICCW adopts a multi-stakeholder approach grounded in critical analysis, modeling, and evidence, ensuring sustainable and responsible water solutions.

Governing Board



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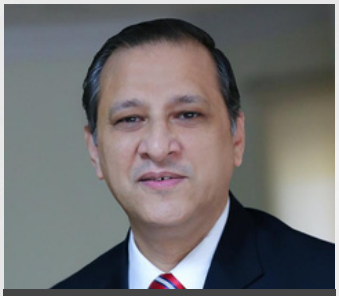

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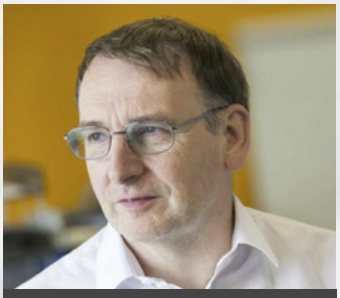

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Imperial college, London

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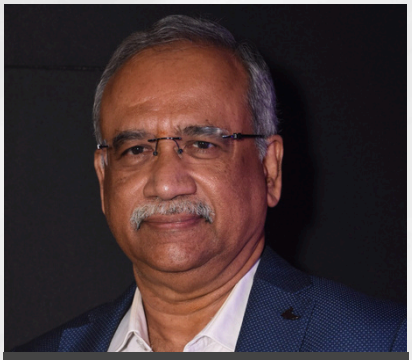

Mr. Ashok Natarajan
CEO, Steady-Taps Consulting

Dr.K.K.Raman
IIT Madras - IIM Calcutta

Message From CEO

ICCW has completed seven years, evolving from the challenges of the pandemic into a strong centre for research, technology validation, hydroinformatics, solution implementation, capacity building, and startup support, enabled by dedicated teams and partners.

Sustainable drinking water systems using emerging technologies for contaminant remediation have been implemented at over 140 locations with real-time monitoring, benefiting 3.4 lakh people. These systems provide a capacity of 2 crore litres per day, saving 320 crore litres of water and reducing 4,500 tons of CO_2 emissions annually.

ICCW promotes comprehensive water management from "source to tap" and "tap to source" through hydroinformatics, field test kits, studies, surveys, and digital tools. Projects ranged from large public events and CSR assessments to industrial water audits and farm-level water budgeting to improve "crop per drop."

Industrial water neutrality was supported through audits, interventions, certification courses with CII, and research on water reuse and resource recovery, with solutions ready for pilot scaling.

Real-time, reagent-free water monitoring devices and heavy metal detection tools were developed and deployed. Capacity-building initiatives included international partnerships, government training programmes, and student certification courses.

In 2024, ICCW established the Waterpreneur Studio Foundation, which has supported 34 water-sector startups through acceleration, incubation, and networking initiatives.

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"In seven years, ICCW has transformed water management from source to tap and back—delivering safe drinking water to 3.4 lakh people while driving sustainability, innovation, and climate resilience at scale."

— **Nandakumar E**
CEO

Key Highlights

Safe Water Access

Enabled access to safe drinking water across 140+ locations, benefiting 3.4 lakh people through real-time monitored systems.

Contamination Solutions

Assessed and demonstrated scalable technologies for fluoride and uranium-affected drinking water systems.

Impact Assessment

Conducted hydroinformatics-led impact assessments of lake rejuvenation projects through CSR partnerships.

Industrial Stewardship

Supported industries in progressing toward water neutrality through audits, reuse strategies, and digital tools.

Applied R&D

Advanced research in sensing, treatment, automation, and digital water systems.

Capacity Building

Strengthened governance, skills, and awareness through national, international, and community programmes.

VERTICALS OF ICCW

At ICCW, our work is driven by six key verticals, each dedicated to advancing water security and sustainability.

Analysis, Validation Industrial R&D

Leveraging measurement technologies and developing solutions for industrial effluents

Implementation

Conducting water management studies and providing integrated solutions with emerging technologies

Hydroinformatics & Policy

Utilizing data-driven insights for modelling and predicting water availability, quality and impact

Research & Development

Innovating low-cost sensors, and treatment systems for real-time monitoring and reduction of water footprint.

Outreach & Capacity Building

Promoting water literacy and conservation through education, awareness campaigns, and strategic collaborations.

Waterpreneur studio

Catalyzes startups and innovations in water sustainability as a dedicated Section 8 non-profit organization within ICCW

Ensuring Safe Drinking Water for Communities

Access to safe drinking water remains the core of ICCW's mission. Across geographies, ICCW integrates appropriate technologies, community engagement, and real-time performance monitoring to ensure sustainable drinking water solutions.

Community Safe Drinking Water Project – Purulia, West Bengal

ICCW, in partnership with NVIDIA and local stakeholders, implemented a Community Safe Drinking Water Project in Dorodih, Kuchung, and Asanbani villages of Purulia district, West Bengal, to address chronic fluoride contamination in groundwater. A Capacitive Deionization (CDI)–based drinking water system was installed to ensure reliable access to safe and clean potable water.

The system is designed to benefit over 4,000 people, significantly reducing reliance on unsafe water sources and improving public health outcomes. The project was implemented with support from ICCW's NGO partner, TSRD, ensuring community ownership, local capacity building, and long-term operational sustainability.

The project was inaugurated by Mrs. Nivedita Mahato, Sabhadhipati, Purulia Zilla Parishad, and Mrs. Sushma Shashidhara from NVIDIA, in the presence of community members and key stakeholders. Community engagement was a core component of the initiative, with students from Sitaram Mahato Memorial College, Purulia, performing the traditional Chhau Dance to promote awareness on safe drinking water and hygiene, reinforcing social acceptance and behavioural change.

Impact Highlights

- Safe drinking water supplied: ~3 lakh litres
- Population benefitted: >4,000 people
- Per capita beneficiary cost: ₹2,487 (inclusive of 3-year operation and maintenance)
- Startup ecosystem support: Deployment and validation support extended to EyenetAqua, Ngen, and Liquiclear
- Source sustainability: Recharge wells initiated to balance freshwater abstraction across all three villages (under implementation)

The project followed a standardised ICCW implementation framework, comprising:

- Baseline water quantity and quality assessment
- Hydrogeological study
- Sustainable technology selection and deployment

Socio-economic model development

- IoT-based monitoring and performance tracking
- Impact assessment
- Three-year post-installation maintenance support

This initiative exemplifies ICCW's integrated approach—combining appropriate technology, hydrogeological science, and community participation—to strengthen rural water security in a sustainable and scalable manner.

Innovation Pilot for Community-Scale Uranium Removal in Drinking Water

ICCW led a landmark innovation pilot for community-scale uranium removal in drinking water supply at Ranbirpura village, Patiala, Punjab, addressing one of the most critical groundwater contamination challenges in the region. In this location, uranium concentrations in groundwater were observed to be as high as 90 ppb, significantly exceeding the World Health Organization guideline of 30 ppb. To mitigate this risk, ICCW facilitated the deployment of the AMRIT uranium removal technology developed at Indian Institute of Technology Madras, designed to remove uranium while retaining essential minerals.

The project adopted a holistic approach, beginning with baseline socio-economic surveys and stakeholder consultations, followed by installation and commissioning of a community-level treatment plant integrated with IoT-enabled water quality and system performance monitoring. Funded under the CSR initiative of NIIF IFL, the plant now supplies safe, uranium-free drinking water to over 2,400 residents. ICCW also emphasized information-education-communication activities in partnership with the local NGO Patiala Foundation to ensure long-term sustainability and ownership. The successful operation of this pilot has demonstrated a scalable, replicable model for uranium-affected regions across India, while delivering tangible public health benefits through access to clean and safe drinking water.

Innovation Pilots for Decentralized Drinking Water Solutions in Dantewada

The ICCW R&D has established innovation pilots in villages of Dantewada district, Chhattisgarh, to address context-specific drinking water challenges through decentralized and technology-driven solutions.

In Kuakonda village, where groundwater availability is severely limited and the population of nearly 600 depends on uncertain sources, ICCW supported the deployment of a 1,200 litres-per-day atmospheric water capture unit, Vayujal, a technology developed at Indian Institute of Technology Madras. This system enables generation of potable water directly from ambient air, ensuring a reliable and climate-resilient source of drinking water for approximately 100 households.

In Hiroli village, where iron-contaminated “lal pani” and the absence of a functional treatment plant posed significant health risks, ICCW facilitated the installation of an iron removal unit based on CSIR-approved technology, coupled with a 4 kLD drinking water treatment system using capacitive deionisation developed by a startup incubated at Indian Institute of Technology Tirupati. The process of integrating these installations with IoT-enabled water quality monitoring to support real-time performance tracking, preventive maintenance, and sustainable operation is underway. Together, these pilots demonstrate ICCW’s approach of aligning innovative technologies with local needs, creating replicable models for improving water security in remote and underserved regions

Measuring Impact through Hydroinformatics and Community-Focused Assessments

ICCW applies hydroinformatics to ensure that water interventions deliver measurable and lasting benefits for communities.

Case Studies in Lake Rejuvenation through CSR Partnerships

Corporate Social Responsibility (CSR) has emerged as a powerful enabler of large-scale water restoration. ICCW's collaborations with leading corporates such as ICICI Bank and Titan Company Limited exemplify how scientific planning and community engagement can drive sustainable lake rejuvenation.

Alkoda Lake Rejuvenation: A Model of Collaborative Impact

Supported by ICICI Bank, the Alkoda Lake Rejuvenation Project illustrates the transformative potential of hydroinformatics-led interventions. The project combined GIS mapping, hydrological surveys, hydrogeological analysis, and socio-economic assessments to guide restoration strategies. As a result, the lake now plays a renewed role in enhancing water availability, groundwater recharge, agricultural productivity, and local livelihoods.

A clear social impact emerged through community narratives. Residents who once faced acute water scarcity now experience improved access, reduced physical burden, and enhanced economic stability. The Alkoda experience highlights how corporate support, when aligned with scientific planning, delivers enduring social and environmental benefits.

Alkoda Lake - Karnataka

Lake rejuvenation undertaken by ICICI

Polambakkam Lake: Scientific Impact Assessment

In Kanchipuram district, Titan Company Limited supported the rejuvenation of Polambakkam Lake, involving desilting, encroachment removal, and channel reconstruction. ICCW conducted a scientific impact assessment to evaluate changes in surface water availability, groundwater recharge, and water quality.

Seasonal monitoring protocols were established to capture temporal variations, enabling evidence-based optimization of restoration strategies. The findings are expected to inform replicable lake rejuvenation frameworks for similar hydrological settings across Tamil Nadu and beyond.

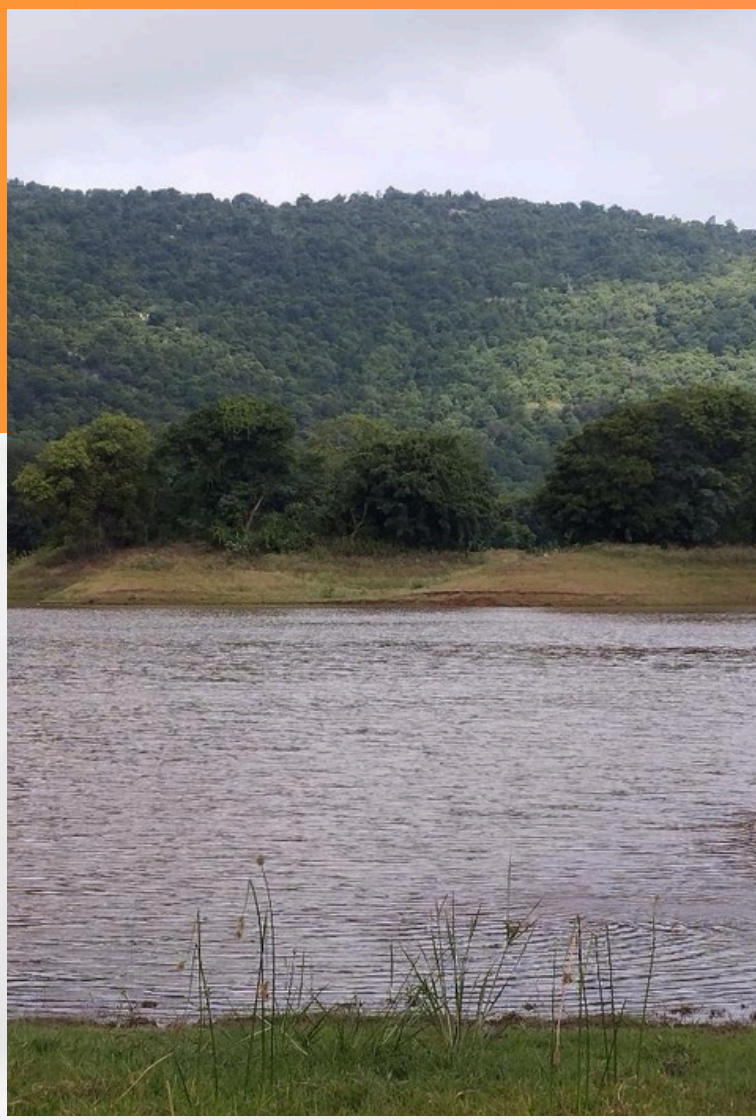
Polambakkam Lake

A focused groundwater assessment of the Nelvoy Tank revealed its critical role as a recharge structure influencing downstream groundwater flows. Positioned near a surface water divide, the tank contributes significantly to groundwater replenishment in command areas, reinforcing its importance for regional water security.

Engaging with community

Reviving Water Heritage: Akka Thangai Lake, Anchetty

ICCW conducted a comprehensive baseline assessment of Akka Thangai Lake in Krishnagiri district with support from Titan Company Limited (CSR) and National Agro Foundation. The study identified severe siltation, catchment degradation, and a loss of over 60% of storage capacity, impacting groundwater recharge and agrarian livelihoods



Akka Thangai Lake

Hydrogeological analysis indicated moderate aquifer productivity with low infiltration rates, leading to the design of recharge shafts and targeted restoration interventions. With over 1.1 lakh cubic metres of silt removed and additional measures planned—bund strengthening, recharge structures, and catchment restoration—the rejuvenation is projected to enhance groundwater recharge by 20–25%, benefiting more than 400 farming households.

A key governance milestone was the formation of a Farmers' Association, enabling community-led lake management and ensuring long-term sustainability of restoration outcomes.

Water Monitoring at Maha Kumbh 2025

Clean Water for a Sacred Gathering

The Maha Kumbh Mela 2025, held in Prayagraj from January 13 to February 26, was one of the world's largest human gatherings, attracting millions of pilgrims. Organized by the Government of Uttar Pradesh, the event placed significant emphasis on infrastructure, sanitation, and water management to safeguard public health.

ICCW undertook a comprehensive water and wastewater management assessment across the Mela area. Working closely with the Public Health Engineering Department and volunteers from MNIT, the ICCW team conducted systematic water quality monitoring, supported by both on-site testing using IoT-enabled field kits and laboratory analysis at a temporary facility set up at the Salori STP.

- Over 1,100 water samples were collected from 25 locations, including key drinking water sources and river points.
- Drinking water quality largely complied with Indian Standards and was consistently maintained throughout the event.
- River water showed expected variations during peak bathing days but remained within safe limits overall.

To complement technical assessment, a social survey involving 65 participants was conducted. The survey highlighted high levels of satisfaction with water availability, accessibility, and overall arrangements, reflecting the effectiveness of water management strategies during the Mela.
This initiative provided valuable insights into managing water quality during mass gatherings and demonstrated how real-time data, field monitoring, and public feedback together support informed decision-making and public health protection.

Baseline Assessment of Water Use in Vehicle Wash Facilities

Driving Towards Sustainability

With increasing stress on water resources, efficient water use and responsible wastewater management in vehicle wash facilities have become pressing concerns.

These centres, often overlooked, consume significant volumes of water and, if not properly managed, contribute to environmental degradation. Recognizing the need for sustainable practices, a study is being carried out to evaluate the current status of vehicle wash systems across India.

The focus is on understanding their alignment with regulatory norms, assessing the adoption of automated and eco-friendly technologies, and identifying opportunities for improving water use efficiency.

The insights from this study will help inform policy recommendations and strategies to encourage the large-scale transition to environmentally responsible and regulation-compliant vehicle wash practices.

Data for Impact

Monitoring Water Treatment Safety and Auditing Volumetric Benefits of Community RO Plants

The International Centre for Clean Water (ICCW) is conducting this scientific assessment to measure the actual volume of safe drinking water delivered to rural households. Through field surveys, performance audits, and data-driven analysis, the project aims to quantify the tangible water benefits achieved, ensure long-term system sustainability, and provide insights that can guide future investments in decentralized safe water solutions across India.

The Assessment of Volumetric Benefits of Installed RO Plants in Anand District, Gujarat is being carried out to evaluate the impact of community-scale water purification systems implemented across 60 villages under the CSR initiative of British Petroleum (BP), in partnership with INREM Foundation.

Installed RO Plants in Anand District, Gujarat

Installed community-scale RO plants in Anand district, Gujarat, covering 60 villages implemented under the CSR initiative of British Petroleum (BP) in partnership with INREM Foundation.

Digital Water Budgeting

Community-Led Water Governance: Building Climate-Resilient Villages through Digital Water Budgeting

Digital water budgeting is emerging as a powerful tool to help communities understand their water realities and plan wisely in the face of changing climates. When villages take ownership of their water data, resilience becomes a shared and achievable goal. A water budgeting and governance initiative in Dariyapur village, Sitapur district (Uttar Pradesh) demonstrates how community-led action particularly through women's participation can strengthen rural water security.

Implemented through the MIDAS digital water governance platform, the programme addressed emerging groundwater stress linked to water-intensive crops such as mentha, paddy, and potato. Using participatory methods, women farmers and villagers were trained in water awareness, rainfall and groundwater monitoring, crop-water planning, and data literacy. Over 100 community members, including 45 women, actively participated in hands-on mapping, water budgeting exercises, and digital data entry.

Ten women emerged as local "water data champions," leading rainfall logging, groundwater tracking, and dashboard use. The village water budget revealed a current surplus while also highlighting long-term risks arising from heavy groundwater dependence and the absence of surface storage. By linking digital tools, local knowledge, and community leadership, the initiative has laid the foundation for inclusive, data-driven water governance offering a scalable model for building climate-resilient, water-secure villages across the country.

Industrial Water Management: From Audits to Digital Tools

Advancing Industrial Water Stewardship and Water Neutrality

Industrial water management remains a core focus area for ICCW, where water audits, hydrogeology Hydrology studies and post-implementation support have played a critical role in improving water-use visibility, identifying industry pain points, and enabling actionable pathways toward water neutrality.ICCW's engagements have strengthened its institutional visibility while helping industries transition from compliance-driven water management to strategic water stewardship.

All industrial audits conducted by ICCW follow CGWA guidelines and are aligned with ISO 14001:2019 Environmental Management Systems (EMS). ICCW's multi-disciplinary approach—leveraging IIT Madras' academic expertise, applied hydrogeology, and emerging startup technologies—has enabled industries to address some of the most complex water challenges spanning utilities, processes, reuse systems, and groundwater sustainability.

MRF Limited – Multi-Plant Industrial Water Stewardship

As part of ICCW's long-term engagement with MRF Limited, multiple manufacturing facilities across southern India were assessed to support the company's transition toward water-efficient, resilient, and water-neutral operations.

The engagements integrated detailed water audits, process-level diagnostics, reuse optimisation, and hydrogeological inputs, resulting in plant-specific and regionally contextualised solutions.

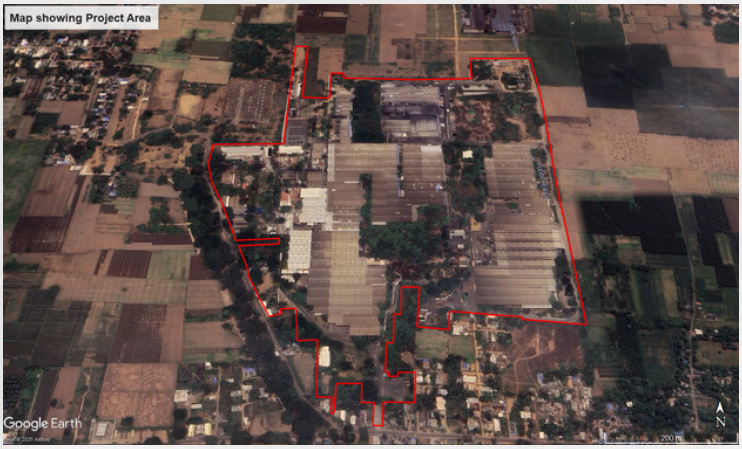
MRF has undertaken several notable water conservation initiatives, including:

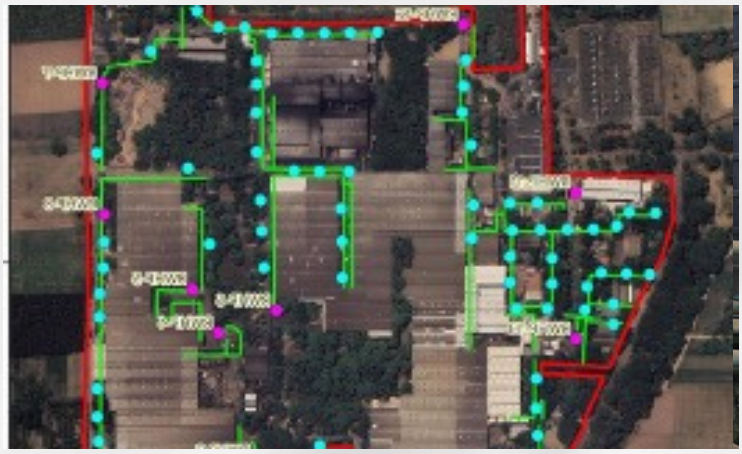
- Reuse of RO reject water for flushing, hand washing, and plate washing
- Recycling of treated municipal wastewater from Perambalur STP for industrial processes at the Trichy plant—an exemplary and replicable solution for industrial freshwater reduction (Under progress)
- Implementation of best-in-class rainwater harvesting and recharge systems, particularly at the Puducherry plant
- Process upgrades in tyre manufacturing delivering both energy and water efficiency gains
- Development of extensive greenbelt areas, supporting pollution control and microclimate improvement
- Adoption of innovative solutions such as smart water management systems, cooling tower evaporation loss management, and water-saving fixtures

These initiatives collectively reflect MRF's strong vision and commitment to achieving water neutrality.

MRF Puducherry Plant

The Puducherry plant engagement focused on improving water efficiency and recharge-led sustainability. ICCW assessed water flows, treatment and reuse performance, and rainwater harvesting systems, identifying low-cost recharge opportunities using existing infrastructure. The study showed strong potential to offset freshwater use through improved reuse and effective recharge, supporting the plant's water neutrality goals and recognised water conservation achievements.





MRF Trichy – TCC & TCR Plants (Tamil Nadu)

The Trichy complex (TCC and TCR plants), one of MRF's high water-demand manufacturing clusters, underwent a comprehensive water audit by ICCW covering sources, process consumption, treatment systems, and reuse pathways. The study focused on developing a reconciled water balance, improving RO and ETP recovery, identifying high-impact reduction measures, and aligning rainwater harvesting and recharge with abstraction. A key planned outcome is the near-elimination of freshwater use for industrial processes through reuse of treated Perambalur STP water, reducing freshwater consumption to ~2–2.5 KLD, limited to domestic needs. Strong leadership and proactive management engagement were critical in achieving these outcomes.

MRF Trichy – TCC & TCR Plants (Tamil Nadu)

At the Tiruvottiyur facility, we focused on optimising water use in a constrained urban and coastal setting marked by groundwater stress and regulatory sensitivity. Interventions included detailed mapping of process and utility water consumption, identification of losses across storage and distribution systems, and hydrogeological assessment of sustainable abstraction and recharge potential. Despite site constraints such as extensive paved areas, the study emphasised a micro-watershed–based approach with recharge interventions beyond the plant boundary to support progress toward urban industrial water neutrality.

ICCW's Collaborative Studies with KCP Cement

ICCW undertook detailed water management studies for KCP Cement at its Muktyala unit in Andhra Pradesh. The engagement included comprehensive water audits and hydrogeological assessments, enabling a holistic understanding of site-specific water use patterns and groundwater conditions.

The studies evaluated existing practices, identified efficiency gaps, assessed long-term water availability, and analysed risks related to groundwater abstraction. Importantly, ICCW translated diagnostic findings into actionable, long-term water management strategies aligned with sustainable abstraction, operational efficiency, and resilience to future water stress.

Through such partnerships with the cement industry, ICCW continues to strengthen responsible industrial water management and contribute meaningfully to regional water security.

KH Exports- Integrated Water Audit & Hydrogeology Study

At KH Exports, ICCW conducted a comprehensive water audit integrated with a hydrogeological assessment, providing high-resolution visibility into water use patterns, reuse potential, and groundwater dependency.

The engagement also highlighted several replicable best practices implemented by KH Exports. The facility has effectively reused RO reject water for plate washing and cleaning purposes, resulting in a measurable reduction in freshwater consumption. In response to local climatic conditions, ICCW supported the design of an efficient recharge system, ensuring that groundwater abstraction is balanced through context-specific recharge interventions.

Additional demand-side measures included the installation of water-saving fixtures across the facility, further strengthening freshwater conservation efforts. For potable water supply, KH Exports in plans to adopt Capacitive Deionization (CDI) technology, enabling the production of low-reject, mineralised drinking water, thereby minimising reject generation compared to conventional RO systems.

Further, ICCW supported initiatives to upgrade the existing Sewage Treatment Plant (STP) to improve treated water quality and reliability, expanding reuse opportunities for non-potable applications. Collectively, these measures position KH Exports as a strong example of integrated, science-led industrial water management advancing toward long-term water sustainability and neutrality.

Smart Water Governance

ICCW's Digital Water Audit Revolution

The Digital Water Audit Tool, developed by the International Centre for Clean Water (ICCW), IIT Madras, marks a major step toward smarter and more sustainable industrial water management.

This hydroinformatics-based platform uses IoT sensors, smart meters, and cloud analytics to monitor, measure, and manage every drop of water in real time. By integrating data from flow meters, leak detectors, and quality sensors, it provides a comprehensive dashboard that helps industries identify inefficiencies, reduce wastage, and optimize water use. The tool empowers both engineers and decision-makers with actionable insights, driving data-based interventions that deliver measurable returns on water efficiency investments. Designed to align with India's industrial sustainability goals, this digital solution represents the shift from manual audits to continuous, intelligent water stewardship. The tool will be available for public use shortly, enabling industries to adopt smarter, evidence-based water management practices.

Industrial Research and Development Projects

Treatment of Industrial Wastewater from Polymer Manufacturing for Environmental compliances

Under this project, ICCW's Applied Research Group focused on ensuring environmental compliance in the treatment of wastewater from a polymer manufacturing facility. The study addressed regulatory challenges associated with high-strength industrial effluents that require advanced and reliable treatment solutions. A compliant treatment framework was developed to consistently meet prescribed discharge standards and environmental regulations. The implemented approach achieved significant reduction in pollutant levels, ensuring safe discharge and minimizing environmental impact. The project supports adherence to environmental norms, responsible effluent management, and sustainable industrial operations. Overall, it demonstrates ICCW's commitment to regulatory compliance and environmentally sound wastewater treatment practices.

Analysis and Treatment of Kaolin Purification Process Water for Reuse Applications (TRL-6)

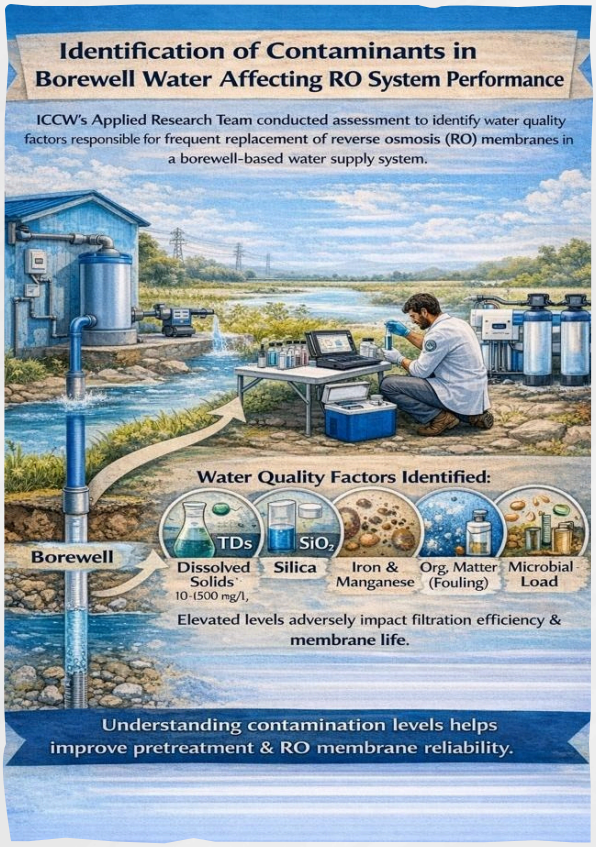
Applied Research Group focused on reducing freshwater demand while ensuring compliance with environmental and reuse quality requirements for the reuse of wastewater generated from kaolin purification processes. Wastewater from multiple process streams was assessed to understand variability and key treatment needs. A tailored treatment framework was implemented to improve water quality and support safe internal reuse. The treated water met or closely approached reuse standards, demonstrating the feasibility of recycling process water. Overall, the project delivers a scalable TRL-6 solution that promotes sustainable water reuse, reduced environmental impact, and improved industrial water efficiency.

Root Cause Analysis of Tyre Curing Process – Improvement Project (Ongoing)

ICCW's Applied Research Group initiated an improvement project to enhance the stability and reliability of the tyre curing process. The project aims to address process variability and strengthen overall operational performance in a critical manufacturing area. A structured and collaborative approach is being followed to review current practices and identify improvement opportunities. Corrective and preventive measures are being developed to improve process consistency and reduce operational disruptions. The initiative is progressing as planned, with phased implementation and performance monitoring. Overall, the project reflects ICCW's commitment to continuous improvement and manufacturing excellence.

Identification of Contaminants in Borewell Water Affecting RO System Performance

ICCW's Applied Research Team carried out an assessment to identify water quality factors responsible for frequent replacement of reverse osmosis (RO) membranes in a borewell-based water supply. The study focused on understanding underlying contaminants and water characteristics that adversely impact RO system performance and lifespan.

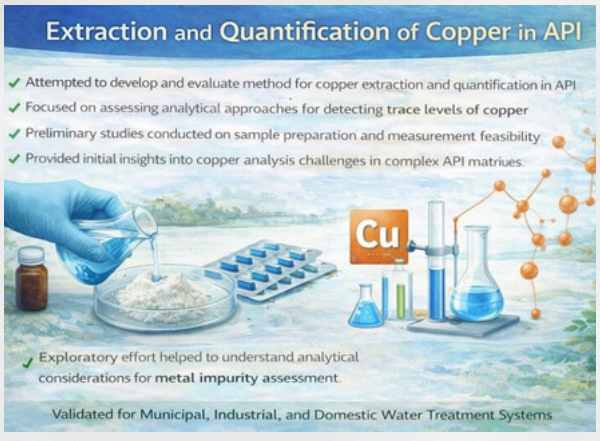


Water samples were analyzed to evaluate parameters linked to membrane fouling, scaling, and degradation. The assessment enabled identification of key contributing factors leading to reduced membrane efficiency and frequent replacement. Findings supported the development of appropriate pretreatment and operational recommendations to improve RO system reliability.

Overall, the study helped optimize RO performance, reduce maintenance frequency, and enhance long-term system sustainability.

Extraction and Quantification of Copper in API

This project involved an attempt to develop and evaluate a method for the extraction and quantification of copper in an active pharmaceutical ingredient (API).



The work focused on assessing suitable analytical approaches for detecting trace levels of copper. Preliminary studies were carried out to understand sample preparation requirements and measurement feasibility. The project provided initial insights into potential challenges associated with copper analysis in complex API matrices. Although exploratory in nature, the effort contributed to understanding analytical considerations for metal assessment.

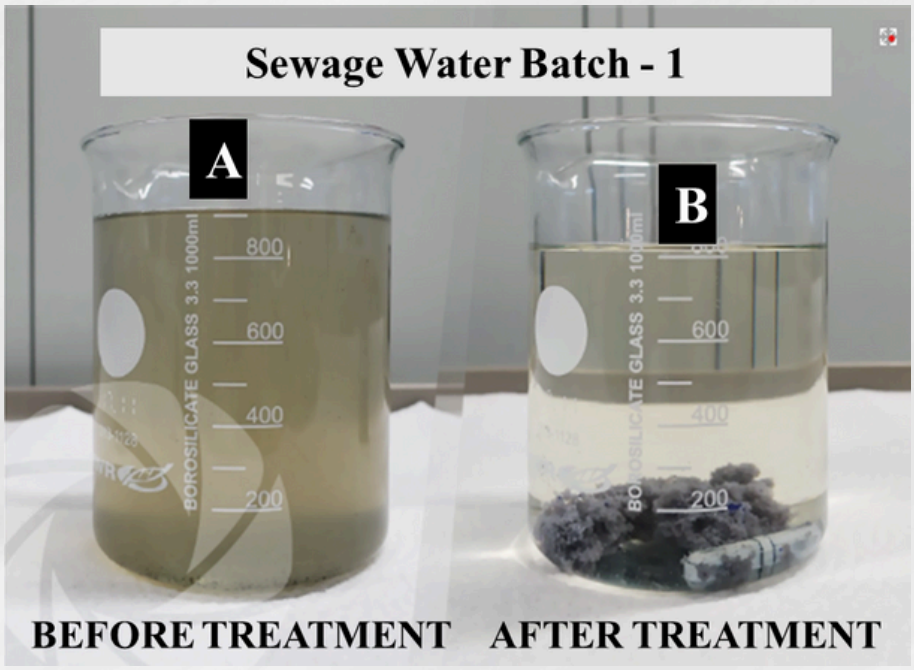
Validation Project

Assessment of System Efficiency for TDS Reduction

An advanced, sustainable water treatment system was evaluated to assess its effectiveness in reducing total dissolved solids (TDS) and improving overall water quality. The study was conducted by ICCW's Applied Research Group under controlled conditions to examine system performance and reliability. The evaluation focused on consistent contaminant reduction and stable operation under varying water quality scenarios. Results demonstrated effective reduction of dissolved impurities while maintaining reliable performance. The system supports water reuse and decentralized treatment with low resource demand. Overall, the assessment highlights a compliant and environmentally responsible solution aligned with SDG 6 (Clean Water and Sanitation).

Validation of Water Treatment Solution

A water treatment solution was validated through laboratory and on-site evaluations conducted by the applied research team. The solution demonstrated consistent performance in improving water quality across different wastewater sources. The validation focused on practical applicability, reproducibility, and stable operation under real-world conditions.

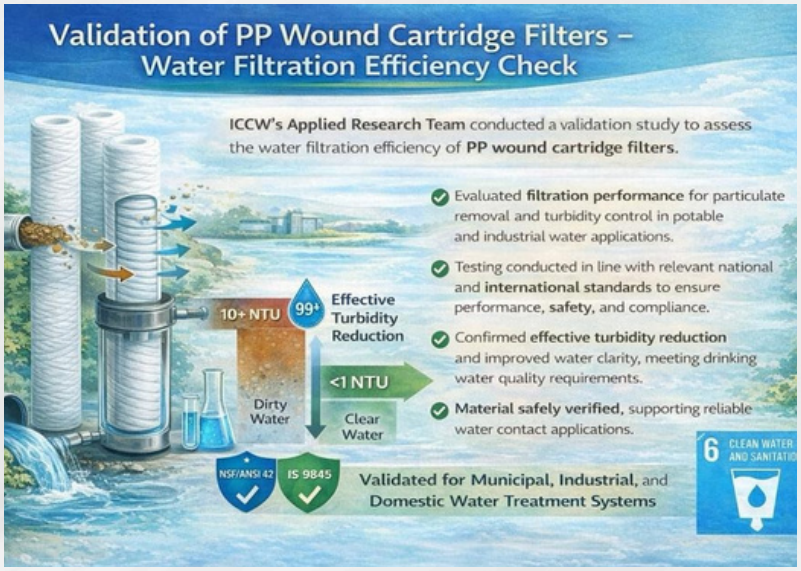


Results showed effective reduction of pollution indicators, improved clarity, and control of odor, supporting safe reuse for non-potable applications. Field implementation confirmed the robustness and scalability of the approach.

Overall, the initiative highlights an environmentally responsible, scalable water treatment solution aligned with sustainable water management and SDG 6 (Clean Water and Sanitation).

Validation of PP Wound Cartridge Filters – Water Filtration Efficiency Check

ICCW's Applied Research Team conducted a validation study to assess the water filtration efficiency of PP wound cartridge filters. The study focused on evaluating filtration performance for particulate removal and turbidity control in potable and industrial water applications.



Testing was carried out in line with relevant national and international standards to ensure performance, safety, and regulatory compliance. Results demonstrated effective turbidity reduction and improved water clarity, meeting drinking water quality requirements. Material safety was confirmed, supporting suitability for water contact applications. Overall, the study validates the reliable use of PP wound cartridge filters in municipal, industrial, and domestic water treatment systems.

Water Quality Assessment and Pollutant Identification of Arkavathi, Cauvery, and Vrishabhavathi Rivers in Bengaluru

ICCW's Applied Research Team conducted systematic water quality monitoring across selected stretches of the Arkavathi, Cauvery, and Vrishabhavathi rivers to assess river health under urban and industrial pressures. Periodic sampling captured spatial and temporal variations, enabling identification of pollution hotspots, key contaminants, and potential risks to downstream water use. The findings supported evidence-based river restoration planning, pollution control strategies, and informed water resource and public health management.

Research & Development

Sensing and Degradation of Emerging Contaminants in Water

The International Centre for Clean Water (ICCW) is actively advancing research at the intersection of sensing, analytics, and treatment of emerging contaminants in water, with particular focus on per- and polyfluoroalkyl substances (PFAS). Recognizing the persistence, mobility, and health risks associated with PFAS, ICCW's efforts are directed toward developing robust tools that enable both accurate quantification and systematic evaluation of degradation pathways.

Ongoing work includes the development of laboratory-scale quantification assays for PFAS that are designed to be sensitive, reproducible, and compatible with controlled degradation studies. These assays are being optimized to track concentration changes during treatment processes, thereby enabling quantitative assessment of removal efficiencies and degradation kinetics. In parallel, ICCW is working with VIT, Vellore to develop simulation based mechanistic insights into PFAS breakdown under different physicochemical conditions. This combined focus on measurement and degradation provides a critical feedback for the design of scalable solutions for managing PFAS and other emerging contaminants. Through this work, ICCW aims to strengthen scientific understanding while enabling translation of laboratory insights into practical water treatment and monitoring frameworks.

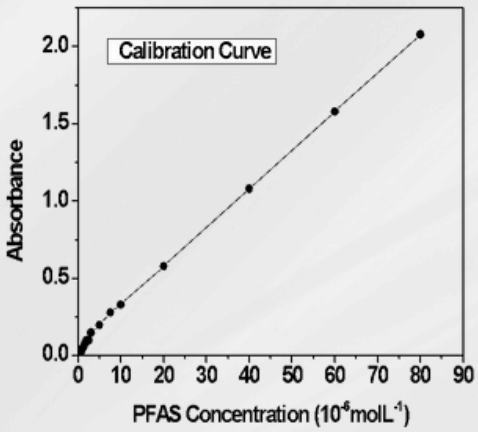


Figure 1. (A) Calibration curve obtained for the detection assay showing a strong linear relationship between analyte (PFAS) concentration (0 - 80 × 10-6 molL⁻¹) and absorbance.

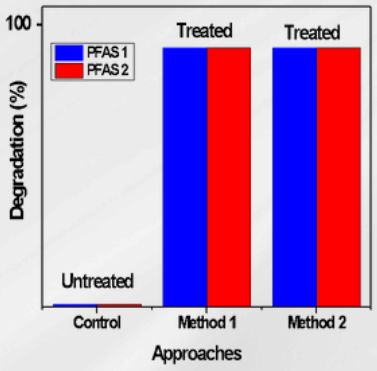
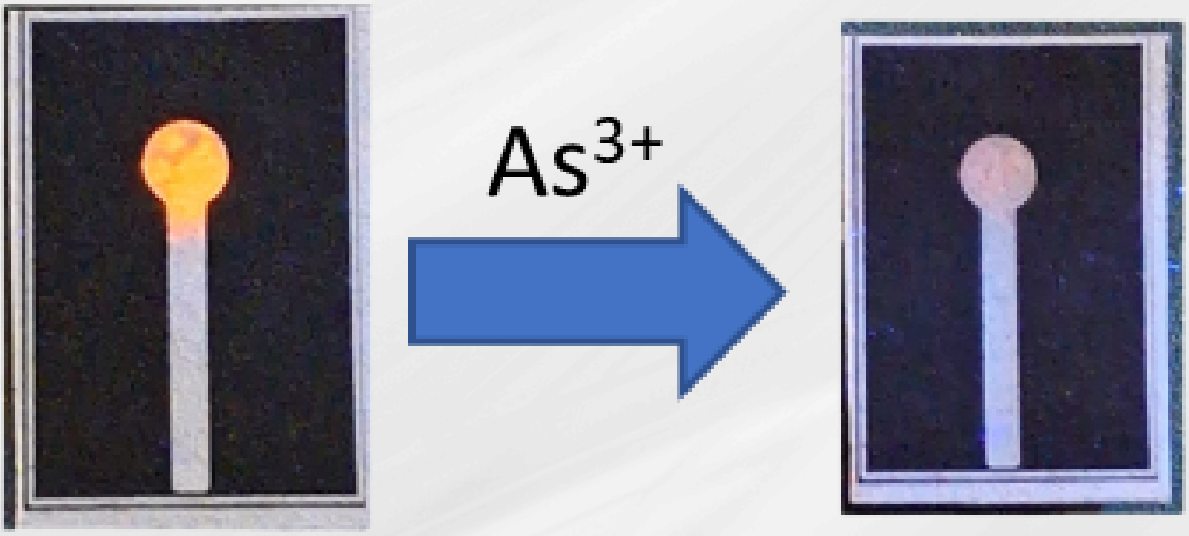


Figure 2. Bar graph showing the percentage degradation of two PFAS contaminant's (PFAS-1 and PFAS-2) using two approaches (method-1 and method-2). Control (Untreated samples) show high residual concentrations, whereas treated samples exhibit a substantial reduction in both contaminants and demonstrating effective degradation (>95%).

Paper-Based Microfluidic Platforms for Arsenic Sensing



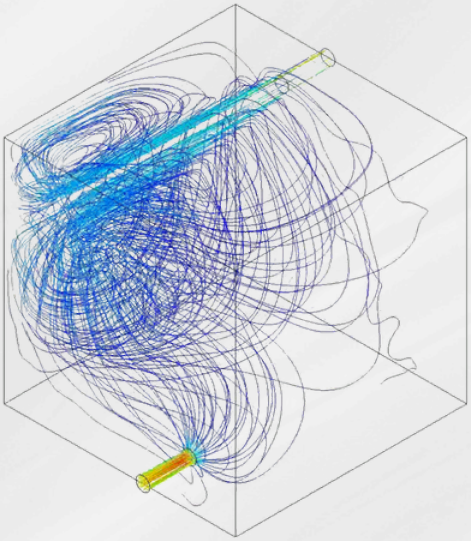
The ICCW R&D is advancing low-cost, deployable sensing solutions through the development of paper-based microfluidic platforms for arsenic detection in drinking water. Recognizing the widespread occurrence of arsenic contamination in groundwater and the need for rapid, field-friendly diagnostics, ICCW's work focuses on translating advanced materials chemistry into simple analytical formats. Upcoming technology development is includes the design and fabrication of paper-based microfluidic strips integrated with fluorescent quantum clusters as the active sensing element. These quantum clusters exhibit selective and concentration-dependent fluorescence response to arsenic species, enabling sensitive visual quantification.

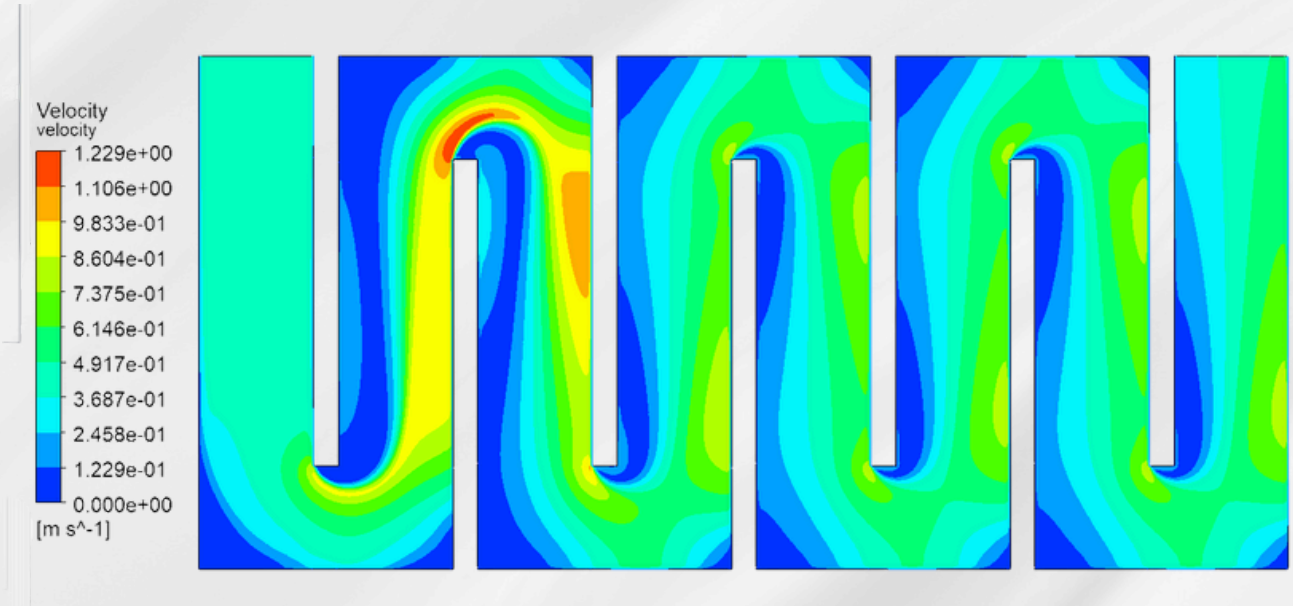
The microfluidic architecture is being optimized for scaled up production using patterned paper substrates, thereby eliminating the need for external complex instrumentation. Laboratory studies are underway to establish robustness under variable water chemistries. By combining material innovation with paper microfluidics, we aim to deliver scalable, affordable arsenic sensing tools suitable for large-scale screening and decentralized monitoring, while also creating a platform that can be extended to other contaminants of concern in resource-constrained settings.

Hydrodynamic Simulations and Digital Twin Development for Wastewater Treatment Processes

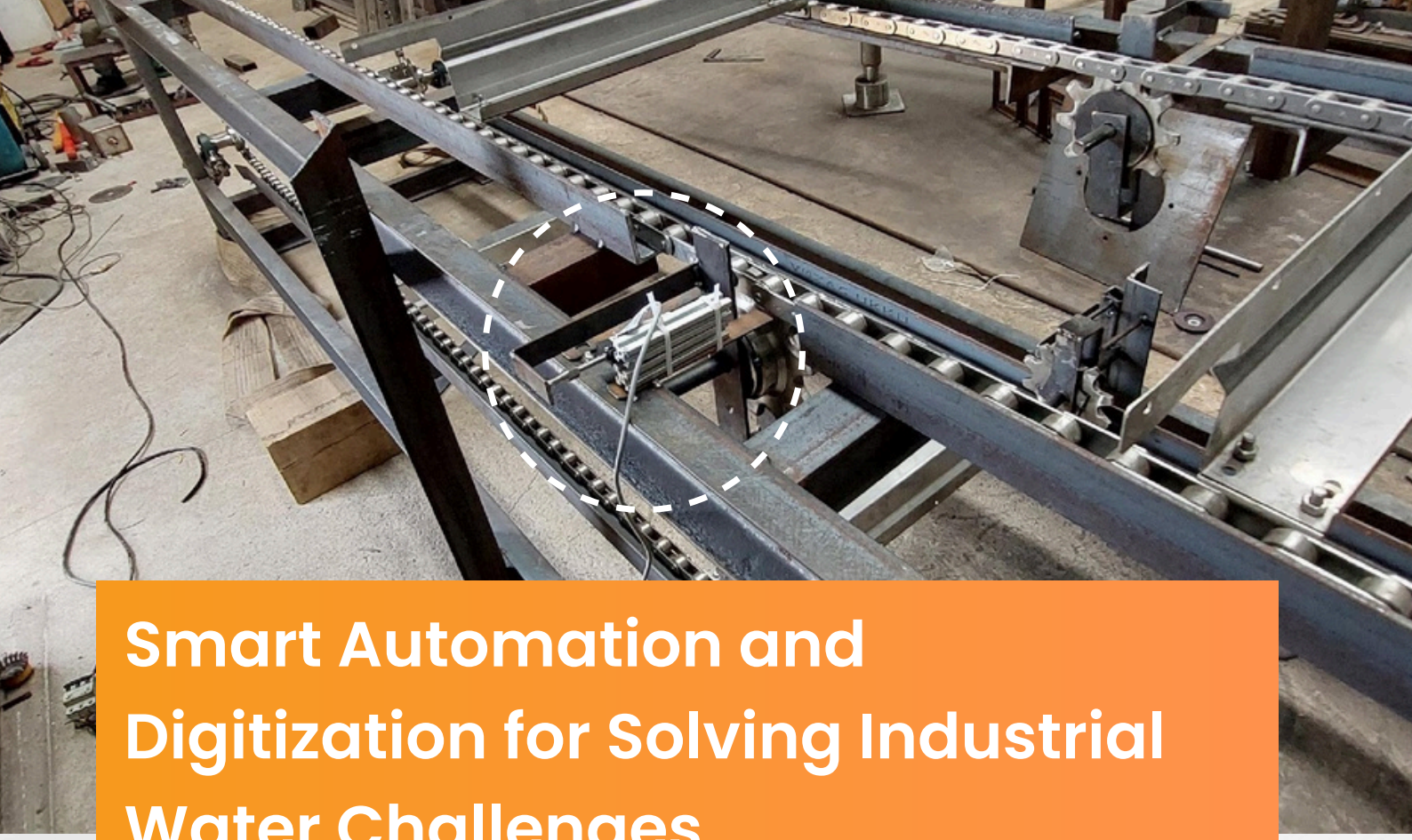
The ICCW R&D is actively advancing hydrodynamic simulations with a strong emphasis on the development and deployment of high-fidelity digital twins for water and wastewater treatment processes. This continuously evolving work directly responds to industry demand for data-driven design, process optimization, and improved operational insight across treatment infrastructure. Using detailed computational fluid dynamics (CFD) models, ICCW is systematically evaluating spatial and temporal variations in flow distribution, mixing efficiency, residence time distribution, and mass transfer across key unit operations.

These physics-based models form the computational backbone of digital twins which can be interfaced with the plant-specific operational data to accurately replicate real-world process behavior. Parallel efforts are underway to integrate these models with real-time sensor data streams and data analytics frameworks. These developments are undertaken in close collaboration with the researchers from VIT Vellore. Together, these activities establish ICCW's digital twin framework as an operational tool that enhances performance in wastewater treatment systems.





Hydrodynamic process simulated in 1 kL tank and a serpentine mixer



Smart Automation and Digitization for Solving Industrial Water Challenges

ICCW is actively developing smart automation and digitization solutions to address operational challenges in industrial water and wastewater management. By integrating advanced sensors, embedded control systems, and IoT-enabled data platforms, ICCW is supporting the development of innovative products that enhance process reliability, operational safety, and regulatory compliance across industrial water treatment processes. A key emphasis of this work is the shift from manual, reactive operations to automated, data-driven decision-making enabled through real-time monitoring, alerts, and predictive maintenance.

As part of this initiative, ICCW has developed a digitization and fail-safe automation solution for API-type oil skimmers and oil–water separators, funded by KPACK Systems Private Limited, Bengaluru. The system is designed for continuous monitoring of oil skimmer operation. Deviations beyond predefined thresholds trigger local audio-visual alarms, remote alerts through a cloud dashboard developed by ICCW-incubated startup EyeNetAqua Solutions Pvt Ltd, and automatic system shutdown, thereby preventing equipment damage and supporting sustainable operation.

In parallel, ICCW is implementing an IoT-based automated water quality monitoring system for water treatment plants in industries, replacing manual testing with continuous, sensor-driven monitoring at critical control points. The system will enable automated generation of compliance reports aligned with industrial standards. Collectively, these projects demonstrate solutions that enhance operational resilience, reduce human dependency, and enable data-driven industrial water management.

Strengthening of R&D Infrastructure for Precision Fabrication and Prototyping

Elegoo Saturn 4 Ultra 16K resin 3D printer

Elegoo Saturn 4 Ultra 16K resin 3D printer

(ICCW) has enhanced its R&D infrastructure by commissioning advanced laser-based fabrication and high-resolution additive manufacturing systems to accelerate development of next-generation water quality sensing and treatment technologies. The CO_2 laser non-metal engraving and cutting machine (SIL-1290) operates with a 100 W laser source at 10.6 µm wavelength and offers a large working area of 1200 mm × 900 mm with ±0.5 mm repositioning accuracy. Integrated features such as water cooling, air assist, double exhaust, and a 64-bit offline DSP controller enable precise fabrication of polymer sheets, membranes, gaskets, and microfluidic substrates used in flow cells and sensor assemblies .

Complementing this, the 50 W fiber laser marking system operates at 1064 ± 3 nm with excellent beam quality (M^2 < 1.2), spot size below 50 µm, and marking speeds up to 3000 mm/s, enabling high-resolution marking and micro-patterning on metallic components such as electrodes.

ICCW has also commissioned the Elegoo Saturn 4 Ultra 16K resin 3D printer, offering ultra-high XY resolution (~14 × 19 µm), layer thickness down to 10 µm, and a build volume of 211.7 × 118.4 × 220 mm. Features such as a heated resin vat, tilt-release mechanism, and reliable fabrication of microfluidic channels in the 100–200 µm range, supported by the ELEGOO Mercury Plus V3 wash and cure system for controlled post-processing.

SIL - CO_2 laser non-metal engraving and cutting machine

Water Technology

"Techno-commercial Assessment of TRL-6 & above Technologies developed in India in Academia, Research Lab & Industry"

Conducted by Dr. Wakeel Ahmed Dar and Professor Thalappil Pradeep

A comprehensive report titled "Techno-commercial Assessment of TRL-6 & above Technologies developed in India in Academia, Research Lab & Industry" conducted by ICCW-IIT Madras, Chennai has been submitted to the Department of Scientific and Industrial Research (DSIR), Government of India.The study was conceptualized to systematically assess, map, evaluate, and document indigenous water purification technologies and identify pathways to accelerate their deployment and commercialization.

This initiative aligns closely with national priorities such as Jal Jeevan Mission, Viksit Bharat 2047, and other flagship programmes focused on ensuring universal access to safe, reliable, and affordable drinking water. Recognizing the critical role of technology in addressing India's water security challenges, the compendium serves as both a knowledge repository and a strategic tool to inform policy, planning, and investment decisions at multiple levels of governance.

The study assessed more than 400+ drinking water treatment technologies developed by academic institutions, national laboratories, start-ups and industries across the country. Of these, over 200+ were shortlisted for detailed evaluation based on their relevance, maturity, and potential for field deployment. The technology readiness mapping revealed that approximately 63 percent of these technologies are currently at TRL 6 or below (prototype stage), 3 percent have reached TRL 7 (field validation), 7 percent are at TRL 8 (ready for market introduction), and 26 percent have attained TRL 9 (fully commercialized). Importantly, 91 percent of the assessed technologies address drinking water purification, while the remaining 9 percent focus on wastewater treatment.This distribution reflects both the strength of India's innovation ecosystem and the need for targeted interventions to advance

early-stage technologies toward large-scale implementation.

The compendium is organized into various thematic sections that collectively provide a comprehensive view of the sector. It begins with an overview of the water technology landscape, highlighting critical challenges such as regulatory delays, limited industry-academia collaboration, and high capital costs that act as barriers to commercialization. The section on Water Quality and Monitoring presents a review of national and international standards, underlining the importance of harmonized protocols and community engagement for effective surveillance. The Regulatory and Safety Framework integrates WHO guidelines and Water Safety Plans, recommending a shift toward proactive, risk-based management approaches to strengthen water security and resilience.

400+ drinking water treatment technologies

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29

For arsenic removal, 29 technologies were identified, nine of which are already commercialized.

A substantial portion of the compendium is dedicated to technology mapping by contaminant category and application area. Contaminants are classified into three broad groups: (i) pathogens, (ii) chemical contaminants (such as arsenic, fluoride, iron, nitrate, and chromium), and (iii) emerging contaminants (including PFAS, microplastics, and pharmaceuticals). For arsenic removal, 29 technologies were identified, nine of which are already commercialized. Fluoride removal technologies, while fewer in number, present opportunities for further R&D and scale-up. Noteworthy domains also include atmospheric water generation, advanced disinfection systems, capacitive deionization for TDS removal, multifunctional hybrid systems, desalination, and solar-based water purification. Rainwater harvesting technologies are well established at TRL 9, indicating their maturity and scalability, while IoT- and AI-based smart water management solutions represent a rapidly emerging area aligned with real-time monitoring goals under national programmes.

In addition to technical mapping, the compendium examines commercialization pathways and systemic barriers to technology deployment. It identifies financial, regulatory, and societal challenges ranging from limited pilot testing infrastructure to complex approval processes and proposes actionable strategies to address these issues. Recommended measures include structured pilot deployments,

the establishment of pollutant-specific technology panels, the creation of a national water technology database, strengthened public-private partnerships, risk-sharing mechanisms, and targeted funding support to advance TRL 4-6 innovations toward commercialization. The study also highlights the need for improved regulatory coherence and accelerated approval timelines to enable faster market entry of promising technologies.

A set of illustrative case studies and success stories showcases practical examples of technology adoption and scale-up. These include community-scale arsenic and fluoride mitigation interventions in West Bengal and Bihar.

The compendium further documents proven practices and widely adopted technologies developed by CSIR and other research agencies, providing state and local authorities with a ready reference for technology selection and deployment. Insights from a national workshop organized under the initiative emphasized multi-stakeholder collaboration, pollutant-specific prioritization, sustainable community-level operations and maintenance, and the central role of DSIR and expert panels in shaping a cohesive technology deployment roadmap.Through this initiative, several key milestones have been achieved. These include the compilation of technologies at TRL 6 and above, the development of a structured techno-commercial assessment framework, inputs from stakeholder consultations, identification and categorization of implementation gaps, and the formulation of actionable policy and commercialization recommendations. By integrating technology mapping with policy guidance and implementation strategies, the project strengthens the country's capacity to respond to drinking water challenges in a structured and evidence-based manner.

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Outreach & Capacity Building

Outreach & Capacity Building, plays a critical role in strengthening human and institutional capacities across India's water sector. Through structured training programmes, international collaborations, industry engagement, academic courses, and public awareness initiatives, ICCW fosters knowledge exchange and empowers stakeholders to adopt sustainable, science-based water management practices.

Capacity Building for Governance and Systemic Change

In 2025, the International Centre for Clean Water (ICCW) conducted a series of high-impact capacity-building programmes in collaboration with the Embassy of Israel in India, MASHAV – Aid from Israel, IIT Madras, the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) under the Ministry of Housing and Urban Affairs (MoHUA).These initiatives brought together government engineers, policymakers, and water professionals from across India, alongside experts from India and Israel, strengthening bilateral cooperation and advancing sustainable water management practices.

The first was ICCW's third Capacity-Building Programme on Safe and Sustainable Water Practices, which brought together government engineers from across India

to examine advanced strategies, technological interventions, and policy frameworks for improving water quality management, supported by knowledge exchange between Indian and Israeli experts.The second programme, Phase II of the Capacity Building Course on "Circular Water Economy & Resource Recovery," focused on wastewater treatment, desalination, reuse, and the conversion of by-products such as sludge and brine into valuable resources, complemented by a technology exhibition featuring leading Indian and Israeli companies and site visits to the Nemmeli Desalination Plant and the TTRO industrial water treatment facility. The third initiative, Phase II of the Capacity Building Programme on "Urban Water Management," was conducted at NITTTR, Chandigarh, marking ICCW's fifth collaboration with MoHUA,

and emphasized sustainable urban water practices, institutional strengthening, and capacity enhancement for urban water governance. Together, these programmes strengthened institutional capacities, reinforced bilateral cooperation with Israel, and reflected ICCW's commitment to advancing resilient and sustainable water management in India.

Glimpses from ICCW's three major capacity-building programmes in 2025, fostering knowledge exchange and resilient water governance.

Industry, Academia, and Knowledge Exchange

Industrial Water Management (IWM 4.0) with CII

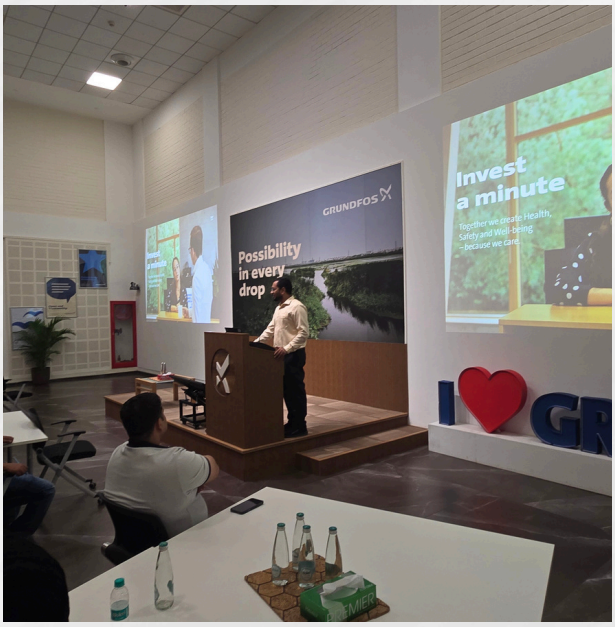
ICCW, in collaboration with the Confederation of Indian Industry (CII), hosted Industrial Water Management (IWM 4.0) at IIT Madras Research Park, a three-day workshop designed to advance sustainable industrial water practices and foster collaboration among industry professionals, startups, and practitioners. The program provided a platform to explore emerging technologies, management strategies, and operational innovations in industrial water use.

The workshop addressed key aspects of industrial water management, including water audit methodologies, digital water assessment tools, and pathways to achieving water neutrality. Participants examined practical frameworks for assessing water consumption, improving efficiency, and establishing sustainable management plans.

50+ PARTICIPANTS

Fostering innovation, collaboration, and sustainable solutions for efficient industrial water use

Sessions also focused on advanced practices and technological interventions, covering zero liquid discharge (ZLD) optimization, smart water monitoring using IoT, and innovative approaches to decentralized water management. Startups presented solutions that demonstrated how digital systems and modern technologies can drive efficiency and promote circularity in industrial operations.



Participants engaged in hands-on learning, including practical exercises and field visits, enabling them to observe industrial water management practices in operation. The program concluded with discussions on emerging trends, innovations, and collaborative strategies necessary to ensure sustainable water use in industrial settings.

IWM 4.0 highlighted the role of knowledge sharing, innovation, and cross-sector collaboration, emphasizing how partnerships between organizations like ICCW and CII can drive sustainable industrial water management practices.

CERTIFICATE COURSE

ICCW successfully conducted the Classroom to Industry Applied Analytics – Data Analysis course from January 27th to 31st. Over five days, participants engaged in hands-on training, gaining practical insights into water data analytics and its industry applications.

The course began with sessions on SQL fundamentals led by experts from Oracle, followed by an in-depth exploration of Power BI for data visualization. A dedicated session on AI and Machine Learning introduced participants to industry trends, real-world applications, and pre-screening interviews for potential job opportunities. Additionally, a Mind Detox session provided a refreshing break, emphasizing a balanced learning approach.

The final day focused on soft skills development, financial literacy, and career development strategies, ensuring participants were not only technically equipped but also industry-ready.

With the support of experienced mentors and active participation, the programme was a great success. ICCW continues to foster learning experiences that prepare individuals for real-world challenges.

CERTIFICATE COURSE

In 2025, ICCW conducted two certificate courses in collaboration with Stella Maris College, reflecting its continued commitment to academic outreach and capacity building in water sciences. The first programme was a 5-day certificate course on Water Quality: Testing, Mapping, and Analysis, which welcomed 20 students. Participants engaged in hands-on laboratory sessions, gaining practical exposure to water quality testing techniques, complemented by interactive learning activities such as quizzes. The programme received positive feedback for strengthening students' foundational understanding of water analysis.

Building on this initiative, ICCW conducted a 10-day Certificate Course in November for II B.Sc. Chemistry students on Water and Hydroinformatics – Bridging Science, Technology, and Sustainability. This advanced programme introduced students to the integration of scientific principles with data-driven tools and technological approaches in water management, enhancing their understanding of sustainable and future-ready water solutions. Together, these programmes underscore ICCW's role in nurturing young talent and fostering interdisciplinary learning in the water sector.

Circular Approaches to Wastewater Management

ICCW served as a knowledge partner for a two-day workshop organized by the International Water Association – South Asia, powered by VA TECH WABAG LTD., in collaboration with Greentivity.in and Ecosan Services Foundation, India (ESF). The workshop brought together water experts, industry professionals, and participants to examine how circular approaches to wastewater management can transform water from a challenge into a valuable resource.

The workshop commenced with opening remarks by Mr. Rajiv Mittal, Chairman and Managing Director of VA TECH WABAG LTD., who emphasized the critical role of water reuse and resource recovery in achieving circularity. ICCW leadership, along with representatives from ESF, shared the strategic vision behind the initiative, setting the stage for two days of knowledge exchange and technical learning. The first day's sessions covered essential topics including sanitation systems for circular design, understanding wastewater characteristics, planning and feasibility assessment, and the fundamentals of wastewater treatment.

On the second day, participants visited the 4 MLD Sewage Treatment Plant at IIT Madras, which demonstrated Indirect Potable Reuse (IPR) and advanced urban water management practices. The technical program included discussions on digitalization in wastewater monitoring, sensor-based data collection, PLC and SCADA system applications, decentralized treatment solutions, and innovative financing and business models for sustainable wastewater management. Interactive sessions encouraged participants to collaboratively explore solutions and share insights.

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The workshop concluded with a focus on the potential of circular wastewater strategies to drive sustainable water management across urban and semi-urban areas. By showcasing advanced technologies, operational best practices, and innovative approaches, the event highlighted the role of knowledge sharing and international collaboration in addressing pressing water challenges.

Indo-Taiwan Water Forum

ICCW, in collaboration with MOENV Taiwan, NYCU, WAOT, and Everclear Environment India Pvt. Ltd., hosted the Indo-Taiwan Water Forum at IIT Madras Research Park. The forum brought together experts, researchers, and industry leaders from India and Taiwan to discuss emerging technologies in wastewater treatment and resource recovery, emphasizing sustainable development and circular economy approaches.

Sessions covered a range of cutting-edge topics, including the application of MCDI in water reclamation, sludge-free oxidation technology for industrial wastewater, and smart water implementation with AIOT insights from cross-sector deployments. Other presentations highlighted fluoride wastewater treatment, decentralized wastewater solutions, and innovative electrical technologies transforming water treatment systems.

The forum provided a platform for knowledge exchange and collaboration, showcasing innovative approaches and fostering dialogue on practical solutions for water sustainability. By facilitating international engagement, the event highlighted the potential for India-Taiwan partnerships in addressing critical water challenges and advancing circular economy solutions.

ICCW at IFAT India 2025: Learning from Global HydroHub

At IFAT India 2025, the session titled "HydroHubs in India and Overseas – Experiences from Centres of Excellence for Water in Leading Universities, Corporates and HydroNations" brought together experts from across academia, industry, and policy to exchange ideas on advancing water innovation and management.

The discussion highlighted how collaborative models and international partnerships can accelerate the development of scalable, sustainable solutions to address global water challenges.

Representing ICCW, Mr. Nandakumar E, Chief Executive Officer, shared insights on ICCW's initiatives that foster innovation, research collaboration, and technology translation to ensure access to clean and sustainable water. The session served as a valuable platform for knowledge exchange, reaffirming the role of collaboration and innovation in shaping a resilient water future.

Community and Youth Engagement

Sustainable water management cannot be achieved through technology and policy alone; it requires informed, motivated, and engaged people. Community and youth engagement is essential to ensure that water solutions are understood, accepted, and sustained over time. By building awareness and capacity at the grassroots level, ICCW helps communities make informed decisions, adopt responsible water practices, and maintain interventions beyond project lifecycles. Engaging youth is particularly critical, as they are future decision-makers and change agents who can drive long-term behavioural change and strengthen water stewardship across generations.

This approach bridges the gap between science and society by translating technical knowledge into practical, locally relevant action. It also strengthens trust, accountability, and collective responsibility in water governance. Ultimately, empowered communities and youth-led initiatives play a vital role in ensuring resilient, inclusive, and sustainable water systems.

Commemorating World Water Day 2025

Drawing Inspiration: Chennai School Event

ICCW marked World Water Day 2025 with two vibrant, youth-focused events in Chennai and Salem—each fostering awareness, creativity, and action around water sustainability. ICCW marked World Water Day 2025 with two vibrant, youth-focused events in Chennai and Salem—each fostering awareness, creativity, and action around water sustainability.

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In collaboration with Jeevan India Missions, ICCW organised a drawing competition at Hindu Senior Secondary School, engaging 100+ students through art and dialogue. The session featured “Water Talk” by Yadu K Damodaran and Neeraja S, who introduced students to real-world water challenges and everyday solutions

The young participants expressed powerful ideas through their artwork—depicting rivers, rainwater harvesting, and a deep emotional connection with nature. The event offered a creative platform to nurture water awareness at a young age.

Commemorating World Water Day 2025

Nature & I Stand Together : Quiz and Dialogue in Salem

In Salem, We joined hands with Sona College of Technology and Sona Medical College of Naturopathy and Yoga for a full-day event titled “Celebrating Water”, aligned with this year’s World Water Day theme: “Nature & I Stand Together.”

Highlights included keynote sessions by institutional leaders and Mr. Nandakumar E, CEO of ICCW, who emphasized science-based and community-driven water solutions. The quiz competition, hosted by X Quiz It, saw the enthusiastic participation of 500+ students, bringing energy and insight to the day.

The event also featured a moving performance by AGAI – Theatre of Voices, blending art and advocacy to celebrate the human-nature connection.

Rooted in art and inquiry, both events reflected ICCW’s belief in early engagement and youth-led change. Whether through sketches or quizzes, World Water Day 2025 reminded us that young voices are key to building a water-secure future.

Commemorating World Water Day 2025

Awareness through Street play & Signature pledge

ICCW celebrates World Water Day with a two-day program focused on water conservation and sustainability, featuring workshops, street plays, and surveys to inspire collective action.

World Water Day 2025 was celebrated in collaboration with the International Decarbonization and Renewable Energy Association (IDREA) at IIT Madras Research Park. The two-day event included a water usage survey, a street play by Agai Theater of Voices, and a pledge board filled with commitments to save water. The initiative reinforced the critical need for sustainable water management.

As we reflect on the accomplishments and initiatives of ICCW in March 2025, we remain committed to promoting sustainable water management and safeguarding this precious resource for future generations. Together, through technology, education, and collaboration, we can create a water-secure future for all.

World Environment Day 2025

To commemorate World Environment Day 2025, ICCW, in collaboration with Bottles for Change (Bisleri India Pvt. Ltd.), organized a spirited beach cleanup drive at Elliot's Beach, Besant Nagar, on the morning of June 1st.

The event saw enthusiastic participation from individuals, student volunteers, and partner organizations, with a special presence by Thiru. R. Vidyadhar, IFS, Tamil Nadu Wetlands Mission, as Guest of Honour. Students from Queen Mary's College brought remarkable energy to the initiative, while Suzhal Arivom conducted an engaging marine awareness session that deepened participants' understanding of shoreline ecosystems and plastic pollution.
The collective effort led to the cleanup and recycling of significant plastic waste, reinforcing action toward environmental sustainability. With hands in the sand and hearts in the cause, the morning stood as a quiet but powerful reminder that lasting change begins with simple, collective steps.

Let's keep our shores as clean as the peace we seek from them.
On this World Environment Day, let's remember—nature gives us a place to breathe; it's our turn to keep it unspoiled.

Observing World River Day

World River Day served as a reminder of the need for responsible stewardship of rivers for present and future generations.

On World Rivers Day, ICCW organized an internal quiz to highlight the importance of rivers in our environment and daily lives. The activity engaged participants in learning about river ecosystems, water management, and the role of rivers in supporting communities.

The quiz provided an opportunity to reinforce awareness and knowledge among staff, emphasizing that understanding and responsible management of rivers are key steps toward their protection and sustainability.

AARU - A Musical Tribute to the Rivers of Tamil Nadu

Music has the power to stir memory, awaken pride, and give voice to what's often forgotten. That's the spirit behind 'AaRu', a newly released music video celebrating the rivers of Tamil Nadu — conceived, composed, and produced by Dr. Kanniks Kannikeswaran, a distinguished alumnus of IIT Madras.

Named after the Tamil word for river, 'AaRu' is a melodic journey featuring the names of over 125 rivers across the state. While rivers like Kaveri, Vaigai, and Tamraparani are well known, many others — once vital to the land and its people — have faded from memory.

"The song brings them to life through vibrant, folk-inspired music that is as nostalgic as it is powerful."

Rivers in Tamil Nadu are more than water bodies, they are cultural lifelines, shaping language, traditions, and livelihoods. But modern development and shrinking catchments have threatened their flow and visibility. 'AaRu' revives that lost connection, not with reports or statistics, but through the universal language of song.

Dr. Kanniks Kannikeswaran

He is a globally acclaimed music composer, educator, and cultural visionary, known for his pioneering work in Indian choral music and cross-cultural productions. An alumnus of IIT Madras, he blends classical Indian traditions with global music forms to tell powerful stories of heritage, environment, and unity.

Through his compositions, Dr. Kanniks doesn't just create music—he builds bridges between the past and present, tradition and innovation. His works often carry deep messages of ecological awareness, cultural pride, and collective harmony.

Lead Vocals

Srinivas

Sharanya

Unnikrishnan

Uttara

This is the third in a growing series of music- led awareness efforts, following

🎵 'Rivers of India' (2021) – a tribute to India's major river systems

🎵 'Monsoon' (2022) – celebrating the bond between rain and Indian arts.

Now, 'AaRu' turns the spotlight homeward, singing of Tamil Nadu's rivers with clarity, rhythm, and reverence.

▶️ **Watch the video here**

More than entertainment, the video is a call to remember, to reflect, and to protect. May this song rekindle pride in our rich river heritage—and renew our responsibility to safeguard it.

Waterpreneur Studio

ICCW's Waterpreneur Studio Foundation is section 8 company that offers end-to-end support from idea to scale stage, enabling water-focused innovators to grow within a single, integrated ecosystem.

From early-stage idea validation and problem–solution fit to pilot deployment, market access, and scale-up readiness, the Studio walks alongside startups at every step of their journey. Founders are supported through structured incubation and acceleration programs, expert mentoring, technical validation, business model refinement, and investment readiness.

By bringing together mentors, domain experts, industry partners, corporates, donors, academic institutions, and policymakers under one ecosystem, Waterpreneur Studio reduces fragmentation and accelerates impact. This one-ecosystem approach ensures that water startups do not just innovate—but successfully transition from ideas to scalable, sustainable enterprises solving real-world water challenges.

Waterpreneur Studio's portfolio has grown to **36 startups, with 14 at the early stage and 22 at the growth stage**, reflecting a structured and deliberate journey from idea recognition to scale.

At the idea stage, the Blue Leap Program is designed primarily to identify and recognise promising ideas and innovators in the water sector. This stage focuses on early insight, intent, and potential, rather than venture building.

The Akamai Incubation Program supports startups in achieving problem–solution fit, enabling founders to validate real-world water challenges, refine their solutions, and develop technically and commercially viable PoCs.

The Akamai Acceleration Program focuses on product–market fit, supporting startups to refine their offerings, validate demand, strengthen go-to-market strategies, and prepare for growth and investments.

For startups ready to expand and scale, the Connexion Program facilitates ecosystem access, partnerships, pilots, and market linkages to enable sustainable scale-up.

Blue Leap

Beyond programs, Waterpreneur Studio actively builds the ecosystem through initiatives such as HydroMingle, conducted in partnership with Fluxgen and WELL Labs, fostering collaboration across startups, corporates, and enablers. Platforms like Coffee with Studio connect founders with the right ecosystem stakeholders, while Founders' Playbook sessions strengthen entrepreneurial capacity through shared learning and practical insights.

Together, this structured pathway ensures startups are supported with the right intervention at the right stage, enabling a seamless journey from idea recognition to scalable impact in the water sector.

Hydromingle

TEAM WATERPRENEUR STUDIO

KAVITHA C

COO

JONALIN SWARNA MOSES

STARTUP ENGAGEMENT ASSOCIATE

RASEENA PARVEEN

OUTREACH ASSOCIATE

Collaboration & Partnership

Sehgal Foundation is dedicated to rural development, focusing on water security, sustainable agriculture, and community empowerment.

Jeevan India Mission Foundation works towards water conservation, sanitation, and community-driven initiatives to promote sustainable living.

Queen Mary's College is a prestigious institution dedicated to academic excellence, research, and student empowerment through knowledge-driven initiatives.

Mega Foundations restores ecosystems through water conservation and afforestation. They have revitalized water bodies, planted millions of trees, and support community-driven sustainability.

Yatha Green Council of India (YGC India) promotes environmental conservation through urban forestry, youth education on sustainable agriculture, and community awareness programs.

RUF promotes rural development through education, healthcare, economic empowerment and environmental sustainability

Collaboration & Partnership

Puthiya Thalaimurai Foundation fosters rural development through education, healthcare, and environmental initiatives. It empowers communities with sustainable solutions and support systems.

Patiala Foundation works to empower communities through sustainable livelihoods, road safety awareness, environmental action, and cultural preservation.

Breathe Green India Pvt.Ltd is an Odisha-based company focused on developing eco-friendly chemicals and machinery for environmental protection. Established in 2022, it aims to support sustainable industrial practices.

Dedicated to climate resilience through nature-based solutions like soil erosion control, water body rejuvenation, biodiversity restoration, and urban air quality enhancement.

Atribs Software Systems Private Ltd, powered by Shield International Group, is driving innovation and empowerment through technology. Under the brand SHIELD SKILL HUB, it is committed to enabling future-ready skills and workforce development.

Innovotek delivers eco-innovations for a climate-resilient future, empowering communities through clean energy and restoration.

Cash Flow Trend

Revenue Report 2024-25

	2024-25	2023-24	2022-23	2021-22	2020-21	2019-20
Direct Revenue	60,804,858	56,609,664	59,234,279	206,174,995	129,711,927	10,288,428
Grants Received	13,299,179	32,223,872	18,709,938	9,755,768	16,453,893	12,000,000
Interest Income	1,099,085	952,448	241,842	460,556	1,384,720	239
Other Income		21,000	1,187,276	3,503	455,387	3,048,582
Total	**75,203,121**	**89,806,984**	**79,373,335**	**216,394,822**	**148,005,927**	**25,337,249**

Expenditure Report 2024-25

	2024-25	2023-24	2022-23	2021-22	2020-21	2019-20
Direct Expenditure	38,680,645	60,068,764	41,336,693	185,007,952	134,462,768	3,125,400
Employee Costs	16,268,509	13,933,558	13,423,161	13,287,807	13,064,113	8,563,609
Operating Expenses	1,304,946	1,171,428	480,182	737,756	538,479	445,283
Administrative Expenses	15,913,137	17,727,621	22,928,001	15,149,662	16,161,036	16,623,207
Total	**72,167,237**	**92,901,371**	**78,168,037**	**214,183,177**	**164,226,396**	**28,757,499**

Support Our Work

Enable Science-Led Solutions for Clean Water

Access to clean and safe water is fundamental to health, dignity, and sustainable development. At the International Centre for Clean Water (ICCW), we work at the intersection of science, technology, and community engagement to address complex water challenges across India.

Your contribution supports the development, validation, and scaling of innovative water solutions—ranging from safe drinking water systems and impact assessments to capacity building, research, and digital water governance.

Every donation helps strengthen evidence-based interventions and enables long-term, measurable impact for communities, ecosystems, and industries.

To understand the reach and outcomes of our work, explore ICCW's Impact Map, which showcases project locations and impact across regions.

Join Us in Building a Water-Secure Future

Scan the QR code to contribute and support ICCW's mission of creating sustainable positive impact through clean water.

View our Impact Map: click here

SCAN HERE

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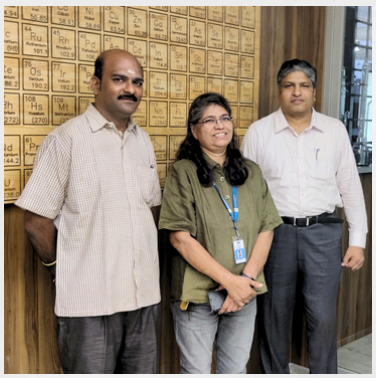

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STUDENT VISIT

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