

GREEN

AUG 2026 | VOLUME 1, ISSUE 8 | PAGE 48

BUSINESSWORLD

WATER SECURITY 2030: FROM SCARCITY TO STRATEGIC GLOBAL ASSET



12

WATER SECURITY 2030:
WHY THE CIRCULAR
ECONOMY NEEDS A
BUSINESS MODEL, NOT
JUST AN AMBITION

15

TRANSFORMING WATER
SECURITY 2030:
NICO'S NANOBUBBLE
INNOVATION FROM TREATMENT
TO RESOURCE RECOVERY

24

SECURING GORAKHPUR'S
WATER FUTURE
BUILDING A RESILIENT AND
SUSTAINABLE CITY

28

WATER UNDER PRESSURE:
THE ESCALATING
CHALLENGES OF
CONTAMINATION



12 | Market Plus

Water Security 2030: Why the Circular Economy Needs a Business Model, Not Just an Ambition

By Turbashu Bhattacharya
Director, Roserve Enviro Pvt. Ltd. (Concord Enviro Group)

15 | Technology

Transforming Water Security 2030: NICO's Nanobubble Innovation from Treatment to Resource Recovery

By Mr. Aman Kapur
Founder & Director, IOTA Group Co.

18 | Insights

Urban Water Resilience: Why India Must Get the Entire Water Loop Right

By Rahul Mankotia
Urban Sector Specialist, KfW Development Bank

21 | Technology

Every Drop Counts. Every Pump Matters. iPUMPNET Makes Both Smarter.

By Anil Sethi
Chairman, Pump Academy Private

24 | Success Stories

Securing Gorakhpur's Water Future Building a resilient and sustainable city

By Dr. Manglesh Kumar Srivastava,
Mayor, Gorakhpur
&
Dr. Saumya Srivastava
Centre Head, Urban Flood Management Cell, Gorakhpur Municipal Corporation

28 | Technology

Water Under Pressure: The Escalating Challenges of Contamination

By Mohammed Naser Azeez
Managing Director, Aquality Intelligent Solutions Pvt. Ltd.

31 | Technology

Water Security 2030: From Scarcity to Strategic Global Asset

By Ishu Rastogi
Director | Business Strategist | Champion of Digital Infrastructure Transformation

34 | Sustainability

Water-Sensitive Urban Development: Integrating Sustainability in Modern Real Estate

By Sheeshram Yadav
Managing Director, Yugen Infra Pvt Ltd

36 | Technology

Maintaining Specific Water Consumption Norms under the Flexible Operation Regime of Thermal Power Plants: Technological Interventions and Best Practices

By Yogesh Singla
Additional General Manager NTPC Limited

40 | Success Stories

Lake Bioremediation by 'BactaServe-Pond Cleaner'

By Monika Singh
Business Development Head, Amalgam Biotech

44 | GEEF PERSPECTIVE

Water Security 2030: From Scarcity to Strategic Global Asset

Water Under Pressure: The Escalating Challenges of Contamination



Authored By Mohammed Naser Azeez

With only 1% of the world's water supply available to meet human needs, protecting water quality has become as critical as conserving water itself. People around the globe are facing growing challenges from both legacy pollutants and a new generation of emerging contaminants that threaten drinking water safety and public health. Substances such as per- and polyfluoroalkyl substances (PFAS), selenium, uranium, nitrates, pharmaceuticals, and industrial chemicals are increasingly being detected in water sources, placing unprecedented pressure on drinking water supply. As contamination levels rise due to industrial activity, urbanization, agricultural runoff, and aging infrastructure, utilities and regulators must adopt more advanced monitoring, treatment, and management strategies to ensure access

to clean, safe, and reliable water for current and future generations.

CHALLENGES OF CONTAMINATION

The challenge extends far beyond water quality alone. Environmental risks today are deeply interconnected with resource constraints, public health concerns, climate-related pressures, and stringent regulatory norms collectively reshaping industries and redefining how organizations manage risk while supporting sustainable growth. As governments, utilities, and businesses confront these overlapping challenges, the need for proactive monitoring, advanced treatment technologies, and resilient water management strategies has never been greater.

Recent findings highlight the urgency of the issue. A government

report identified uranium contamination in Delhi's groundwater, placing the national capital among the regions most affected by this emerging water quality concern. According to the findings, about 15% of groundwater samples tested exceeded the safe drinking water limit for uranium. Acting on these findings, the National Green Tribunal (NGT) sought responses from the Delhi government and the Delhi Pollution Control Committee regarding potential risks to public health and groundwater safety.

Our mission is to shape a better future where environmental stewardship and human progress work hand in hand, advancing lives without compromising the world we depend on.

In a subsequent order, the tribunal also took note of a Central Ground Water Board (CGWB) study pub-

lished in the Annual Ground Water Quality Report 2025, which revealed that 24 of 83 groundwater samples collected across Delhi exceeded permissible uranium limits. Referring to the study, the tribunal noted that while groundwater quality remains generally safe across most parts of India, certain regions are experiencing increasing uranium concentrations, underscoring the importance of continuous monitoring and targeted mitigation measures to protect drinking water supplies and public health.

The report further identified north-western India including Punjab, Haryana, Delhi, and parts of Rajasthan and Uttar Pradesh as a hotspot for uranium contamination. Report attributed the elevated levels primarily to natural geological processes that release uranium into groundwater, compounded by groundwater depletion and specific aquifer characteristics. These findings serve as a stark reminder that water contamination is no longer limited to conventional pollutants; emerging contaminants present complex challenges that require coordinated action from regulators, water utilities, industries, and communities alike.

As contamination threats continue to evolve, ensuring access to safe drinking water will depend on a combination of scientific innovation, regulatory vigilance, and sustainable resource management. The growing presence of contaminants such as uranium and PFAS demonstrates that protecting water supplies is no longer simply an environmental priority, it is a public health matter and a critical component of long-term economic and societal resilience.

NEED FOR RELIABLE TREATMENT SOLUTIONS

Addressing modern water contamination challenges requires more than simply selecting a treatment process. Treatment performance depends on technologies that are carefully designed, manufactured, and implemented to address the

realities of local water chemistry, site-specific constraints, operational requirements, and long-term sustainability.

Water quality can change throughout the year, making treatment more challenging. Seasonal changes, different levels of contaminants, variations in groundwater quality, and ageing infrastructure can all affect how well a treatment system performs. That's why it is important to use reliable and flexible treatment technologies that can handle these changing conditions. Such systems help utilities and industries meet water quality standards, operate smoothly, and provide a safe and dependable supply of drinking water over the long term.

At Aquality Intelligent Solutions, we are committed to advancing sustainable progress that empowers people, enriches communities, and preserves the health of our planet.

TREATMENT TECHNOLOGIES FOR INDIA'S WATER CHALLENGES

India's diverse water quality issues require a combination of advanced and conventional treatment approaches tailored to regional conditions and contaminant profiles.

Uranium Removal

In areas where groundwater contains high levels of uranium, such as parts of Delhi, Punjab, Haryana, Rajasthan, and Uttar Pradesh, several proven treatment methods can provide safe drinking water:

- **Ion Exchange:** A highly effective method that removes dissolved uranium from groundwater.
- **Reverse Osmosis (RO):** Removes uranium along with heavy metals, dissolved salts, and many other harmful impurities.
- **Special Adsorption Media:** Uses specially designed filter materials that selectively capture and remove uranium from water.



Mohammed Naser Azeez
Managing Director, Aquality
Intelligent Solutions Pvt. Ltd.

- **Blending and Source Management:** Where contamination is limited to certain areas, treated water can be mixed with clean water from safe sources to meet water quality standards while reducing treatment costs.

These technologies help ensure safe and reliable drinking water in regions affected by uranium contamination.

PFAS and Emerging Contaminants

As concerns about PFAS and other harmful pollutants continue to grow, cities and industries are adopting advanced water treatment technologies to keep water safe. Some of the most effective solutions include:

- **Granular Activated Carbon (GAC):** Removes PFAS and other harmful organic chemicals by trapping them in specially treated carbon.
- **Advanced Oxidation Processes (AOPs):** Uses ozone, ultraviolet (UV) light, and oxidizing agents to break down difficult-to-remove contaminants.
- **High-Pressure Membrane Systems:** Technologies like nanofiltration and reverse osmosis (RO) remove a wide range of pollutants, including



dissolved chemicals and impurities.

- **Continuous Water Monitoring:** Smart monitoring systems detect changes in water quality in real time, allowing quick action before contamination becomes a serious problem.

Selenium and Heavy Metal Treatment

Water in areas affected by industries, mining, or naturally occurring metals may contain harmful substances like selenium and other heavy metals. These can be treated using:

- **Chemical Treatment Systems**– Remove harmful metals by converting them into solids that can be safely separated.
- **Biological Treatment** – Use natural bacteria to reduce selenium and make it safer.
- **Membrane Filtration** – Special filters remove dissolved metals and other impurities from water.
- **Adsorption Technology** – Uses special materials to capture and remove specific heavy metals from water.

These approaches help achieve compliance with increasingly stringent water quality standards while minimizing operational complexity.

Nitrate and Agricultural Contamination

Fertilizers and agricultural runoff can increase nitrate levels in water, making it unsafe for drinking. These issues can be addressed through:

- **Biological Treatment** – Uses natural bacteria to remove nitrates from water.
- **Ion Exchange Systems** – Replace nitrate ions with safer minerals.
- **Reverse Osmosis (RO)** – Effectively removes nitrates and other dissolved impurities.
- **Watershed and Source Management** – Reduces pollution at its source through better farming practices and proper water resource management.

Combining treatment with source management often delivers the most sustainable long-term results.

BUILDING RESILIENCE THROUGH INTELLIGENT WATER MANAGEMENT

As contamination risks evolve, success increasingly depends on combining advanced treatment solutions with robust monitoring, predictive analytics, and long-term asset management strategies. Organizations must move beyond reactive responses and adopt inte-

grated approaches that address water quality challenges at their source while ensuring operational reliability and regulatory compliance.

DELIVERING SUSTAINABLE ENVIRONMENTAL SOLUTIONS

Aquality Intelligent Solutions is an environmental solutions company that partners with municipalities, industries and organizations to address complex challenges where environmental pressures, regulatory expectations, and operational risks intersect.

Guided by the mission to advance the way of life without compromising the integrity of our environment, Aquality believes that environmental responsibility and human progress go hand in hand. The company's management team, engineers, field personnel, and technical experts combine science, technology, data, and practical expertise to deliver solutions that improve operational efficiency, reduce environmental risks, and support sustainable growth.

Aquality is also committed to promoting solar-powered water treatment solutions, providing reliable access to clean water in areas with limited or unreliable electricity. By harnessing renewable energy, these systems reduce operating costs, lower carbon emissions, and offer a sustainable and cost-effective approach to water treatment for rural communities, industries, defence forces deployed in remote locations.

By helping clients protect the air we breathe and the water we drink, Intelligent Solutions delivers innovative environmental technologies, intelligent monitoring, and practical implementation strategies that strengthen communities, industries, and businesses. Through its integrated approach including renewable energy-powered water treatment, the company is helping organizations address today's environmental challenges while building a cleaner, more sustainable future.

