



REDUCE REUSE RECYCLE

THE WAY FORWARD

Water and waste management has become one of the most important subjects when the country is aiming to become a developed nation by 2047. Water security and green transition will play a major role in India's path towards 'Viksit Bharat'. In this scenario, **Construction Times** presents the way forward for Reduce, Reuse, Recycle.



India is facing a severe water crisis, with demand consistently exceeding supply. Despite having 18% of the world's population, the country has only 4% of global water resources. India has been witnessing a progressive decline in per capita availability of water. Government, through various schemes such as the Jal Jeevan Mission, is trying to improve the situation and has some positive impact, especially in the rural parts of the country. Urban area which was earlier enjoying a better water infrastructure is now facing the challenges of growing urbanization leading to inadequate access to water resources. The growing urbanization has also put more pressure on the solid waste management

and sewage systems of the country's urban regions. Today, water security and waste management have become the priority matter for the country.

WATER SECURITY

Water infrastructure development and maintenance continue to be one of the primary focus areas for the country. Water security has become one of the most important factors today. India is facing a severe water crisis, with many people experiencing water stress due to limited freshwater resources, climate change, over-extraction for agriculture and domestic use, and pollution of water bodies. Improving water management, implementing water conservation techniques, better wastewater treatment and reusing water by recycling technologies are the way forward to effectively tackle this situation.

WATER INFRASTRUCTURE

Government schemes are proving to be very important and increasingly effective in addressing India's water crisis. Under the schemes such as the Jal Jeevan Mission and AMRUT, India's water supply and distribution infrastructure has improved significantly. In rural India, the Jal Jeevan Mission has been a game changer. Household tap water coverage has risen from just 17% in 2019 to nearly 80% in 2025, reaching about 15.5 crore rural households. "The focus now is shifting from mere coverage to ensuring functionality, water quality, and source sustainability, particularly in drought-prone and tribal regions," says **Saurin Patel, Head - Integrated Water Vertical, Welspun Enterprises.** Under AMRUT, close



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to 12 million new water connections and 8.5 million sewer connections have been provided. "AMRUT 2.0 is pushing towards 100% coverage across all towns. However, challenges remain—intermittent water supply, significant distribution losses (30-40% non-revenue water), and inequitable access in slums and peri-urban areas continue to be pressing concerns," he adds.

Looking at the current scenario in water



Abhinandan Sethi,
Managing Director,
SPML Infra Limited

infrastructure. **Abhinandan Sethi, Managing Director, SPML Infra Limited, highlights,** “Overall, India’s water supply strategy is moving from supply-driven to demand-responsive, from fragmented to integrated management, and from public provision to hybrid models. Yet, ensuring equity and affordability remains the most critical challenge in this transition.”

The schemes are essential for bridging the rural-urban water supply gap, improving public health and ensuring equitable distribution of water resources across the country. “**They provide the critical infrastructure backbone needed to move from fragmented, unreliable water supply to universal household-level access. However, their long-term success depends on robust monitoring, adequate funding, and behavioural change at the consumer level,**” adds Sethi.

A comprehensive range of piping systems and solutions is needed to support the mega schemes of JJM and AMRUT. **Partha Basu, Managing Director, Ashirvad by Aliaxis,**



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elaborates, “At Ashirvad by Aliaxis, we are committed to enabling safe, sustainable, and scalable water access across India. Our comprehensive range of piping solutions includes Ashirvad FlowGuard Plus CPVC Systems for hot and cold-water distribution, Ashirvad Aqualife+ uPVC for cold water application, drainage solutions, rainwater and storm water management, specialized agricultural products like column pipes, casing pipes, and agri pipes for borewell extraction and farm irrigation and infrastructure pressurized water distribution through OPVC and HDPE.”



WASTEWATER RECYCLING

India’s water future will be defined by recycling, reuse, and smarter resource use. The country is moving rapidly toward a circular water economy, with major shifts in wastewater recycling and reuse. India is seeing several emerging and accelerating trends in wastewater recycling: deployment of tertiary treatment technology to enable reuse for industrial, agricultural and even municipal uses. Sectors like textiles, pharmaceuticals, and power plants are adopting zero-liquid discharge systems to minimize environmental discharge. Treated sewage is being reused for non-potable applications — landscaping, road cleaning, industrial cooling, and toilet flushing.

“We are playing a strong role in driving India’s water and wastewater infrastructure. In FY25 YTD, the company secured orders with 1,178.30 crore in its core segments - Sewage Treatment Plants (STP) and Common Effluent Treatment Plants (CETPs),” says **Manish Jain, Managing Director, Enviro Infra Engineers Limited.**



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The Union Ministry of Jal Shakti has mandated cities to reuse at least 20% of consumed water, while the National Mission for Clean Ganga targets 50% reuse by 2025 and 100% by 2050 in areas with operational STPs. States are also setting ambitious goals, Haryana plans to raise treated wastewater use from 15% to 80% by 2030.

“But there is a significant gap between sewage generation and treatment, only around 32 percent of sewage is treated, with a major portion remaining untreated and disposing into rivers, lakes and other water bodies. This presents both a challenge and an enormous opportunity. The focus is now shifting from just building treatment infrastructure to creating robust frameworks for reuse, with emphasis on equity, climate resilience, and sustainable water management

practices to transform wastewater from waste to a valuable resource,” points out Sethi.

“India’s water infrastructure is poised for a phase change: more capital, smarter governance, and deeper public-private synergy,” says **Shailendra Kumar Tripathi**, Deputy Managing Director, Kalpataru Projects International Ltd (KPIL). Talking on the way



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forward, he adds, “We believe the way forward requires policy-level de-risking, stronger contracting discipline, capacity building, and transparent stakeholder models — traits that KPIL endeavours to bring into every engagement.”

SOLID WASTE MANAGEMENT

India’s municipal solid waste generation is estimated to have been around 1.45 to 1.70 lakh metric tonnes per day in recent years, with this figure expected to rise due to increasing urbanization and consumption. By 2030, generation could reach 165 million tonnes, with projections for significant growth in the waste management market. Also, India’s industrial waste generation is substantial and increasing, with millions of tonnes of solid and hazardous waste produced annually, including significant amounts of e-waste and plastic waste. The construction & demolition waste is also increasing over the years. Effective recycling and reusing of these wastes promote circular economy.



The landscape of Municipal Waste Management (MSW) management in India has transformed notably. **Mahendra Ananthula**, Group President, Operation Business Development and Diversification, Antony Waste Handling Cell Limited presents the latest



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Antony Waste Handling Cell Limited

trends in MSW, “Accelerated segregation at source is one major development as municipalities and corporates adopt campaigns and incentives to ensure recyclables, organics, and landfill-bound waste are separated from the household level. Digital platforms are powering route optimization, real-time fleet tracking, and smart collection bins to heighten efficiency and minimize missed pickups or excess landfill use. Community engagement via awareness initiatives and partnerships with informal workers enable resource recovery and a circular approach to urban waste. Per capita urban waste generation is projected to hit 0.7 kg per day by 2025, requiring decentralized strategies, investment in material recovery facilities, and visible improvements under Swachh Bharat Mission Urban 2.0.”

According to him, the company is enabling systematic waste collection, segregation and disposal. “Waste-to-energy and bio-mining facilities convert thousands of tonnes of waste to electricity, reclaiming land and shrinking the waste footprint. To counter infrastructure gaps and regulatory challenges, Antony Waste has invested in new plants, resilient frameworks, and escalation clauses to cushion against inflation-driven cost rises,” says Ananthula.

India’s water infrastructure is undergoing a major transformation through flagship programs such as AMRUT 2.0, Swachh Bharat Mission 2.0, Jal Jeevan Mission, and the Smart Cities Mission. Coupled with this, it is critical that these efforts are complemented with robust policies to maximize reuse of treated wastewater. More policy measures towards the recycling and reuse of solid waste will complement India’s journey towards a sustainable Viksit Bharat! ■