

Groundwater: India is on the right preservation path

India has 16% of the world's population, but only 4% of its freshwater resources. Given our existing consumption patterns, including rampant groundwater extraction, estimates suggest that by 2030, we will only have half of the water we need. While the technology to commercially produce freshwater from the oceans or out of the atmosphere is not yet entirely viable, a crisis of this magnitude does require sustained investment in innovation and technology to improve the management efficiency of our water resources. Fortunately, there is growing evidence that India is on the path to giving water the priority it deserves.

Nearly 80% of our freshwater resources are used for agriculture, about 8% in industries, and about 6% for domestic usage. With over 50% of our population dependent on agriculture, farming, and horticulture, depletion of water supply could potentially threaten the nation's food security. In such a scenario, spotting, supporting, and scaling up some of the promising innovations at the grassroots level can be a viable strategy for the country.

Take for example the government's National Project on Aquifer Management (NAQUIM), which aims to provide comprehensive and realistic information on groundwater resources in different hydrogeological settings in real time. This can help prepare, implement, and monitor the efficacy of various management interventions, which, in turn, can help achieve drinking water security, improved irrigation facilities and sustainability in water resources development.

The Kaleshwaram Lift Irrigation Project on the Godavari in Telangana is the world's largest and India's first multi-purpose, multi-stage lift irrigation project with an IT-enabled water management system being used for full-scale irrigation. The state government has deployed a decision-support system with a real-time assessment of water availability, demand and inflow forecast to provide planning and operational schedules for pumps and reservoirs. The system automatically determines the pump operations and executes irrigation without human intervention. The project has increased the irrigated area by 2,251 hectares (total irrigation potential of 7,38,851 hectares) and has enabled farmers to reap multiple crops with a year-round supply of water as against dependence on rain.

Another interesting innovation is the Indian Agricultural Research Institute's Pusa hydrogel – a biodegradable cellulose-based hydrogel that absorbs water 300 times its size. During water-less or drought conditions, it helps plant roots use the water it has retained.

At Ramthal, Karnataka, a public-private partnership between the Karnataka government, an Israeli irrigation company for technical assistance, and an Indian engineering company for implementation, is Asia's largest community irrigation project that provides water to 7,000 smallholder farmers across 22 communities through a cylinder installed in their farms. Farmers can mix their fertilisers and pesticides in the same cylinder, helping eliminate water wastage. The technology used also purifies the wastewater flowing back into the

Krishna river.

Several start-ups have developed precision-irrigation solutions that provide predictive insights to farmers on the optimal watering for crops based on seasons, soil type and crop growth phase. Embedded with Machine Learning, or the Internet of Things, such innovations monitor soil conditions, weather changes, evaporation rates and plant water use to determine and adjust watering schedules.

These innovations are achieving results on the ground and if deployed at scale, can become prime movers for achieving accelerated efficiencies in water usage. And it is not just the government or agricultural communities who play a role here. Industries too can amplify the work through action in three areas of influence – direct operations, supply chain and wider basin health.

Companies can implement water monitoring and reporting processes to identify and eliminate water leaks and adopt water-saving technologies. They can encourage the use of renewable energy, put supplier standards in place and assign water expert teams to help suppliers implement efficient solutions.

Wastewater treatment technologies such as filtration, dissolved air flotation, absorption, and distillation can ensure the treated stream

is suitable for discharge or other uses. Product life-cycle assessment can help manufacturers identify hot spots of maximum water consumption to focus their conservation investments. Consumer companies can develop products that require less water to manufacture, use water-saving formulas and biodegradable ingredients. For example, Hindustan Unilever through its Hindustan Unilever Foundation (HUF), has created a cumulative water conservation potential of about 1.9 trillion litres in the last 8-9 years by working in thousands of villages on the demand-and-supply side partnering with the governments, non-governmental organisations, frontline field workers, communities and, of course, farmers.

Securing India's water future needs to evolve into a movement with everyone getting involved. We need to move from being merely "users of water" to more active stewardship of water. We need to ensure that water consumption is not only environmentally sustainable or economically beneficial but is also socially and culturally fair. An inclusive strategy that considers both site- and catchment-based measures supported by the collection and analysis of complex data as well as joint investments from various stakeholders, collective water governance and accountability mechanisms is an achievable objective today.

While the government and the private sector are allocating resources, context-appropriate innovations require funding to scale up. Efforts need to be undertaken to identify and benchmark changes those innovations can bring over time. Strategic investment of capital in proven solutions will amplify the results many times over. With the large-scale adoption of innovative solutions, we can ensure that our country has a food and water secure future.



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The views expressed are personal