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Water and cities: Information, innovation and implementation

Using emerging trends in information technology and data collection, cities can implement decentralized governance systems to ramp up urban water infrastructure

Photo: Ramesh Pathania/Mint

We have to get smarter about our cities. Especially when it comes to the most basic of public services—water supply. Not one Indian city, including the capital, New Delhi, can claim that every resident has access to safe water from a tap in their home.

All cities should have that quality of access and service as a benchmark and a goal.

Yet, how can we get there from where we are now?

Can India afford to develop physical water infrastructure similar to that of western countries for all its 8,000-plus urban settlements? Or even just for its 500 larger cities? Is there enough capital, or for that matter enough water?

We believe there is a real opportunity to innovate our way to improved public access to water, without aping unsustainable models of the past century. Using emerging trends in information technology and data collection, cities can implement decentralized governance systems based on ecological planning to ramp up urban water infrastructure quickly and cost-effectively.

Information architecture matters

One major weakness of all water utilities is the absence of data on the sources and volume of water supply in the city.

Think on this. Singapore measures and manages four sources of water supply: imported water from Malaysia, harvested rainwater, recycled wastewater and desalinated water. In India, too, cities have multiple sources of water, but no agency has complete information about this. Citizens access water from the usually inadequate piped municipal supply, but also from wells and bore wells, rainwater, tanker water, treated wastewater, and even bottled water.

This reality cannot be wished away soon. Yet, if we build a data infrastructure around these multiple sources, it could create a flexible,

responsive water management system.

Cities can use such data to integrate surface and groundwater sources more wisely. Some are trying. Belgaum recently mapped and cleaned up its old open wells with the help of the local community, installed sand filters and chlorinators and supplied well water to neighbouring areas. This augmented piped water supply at a much lower cost. The city government has now become more ambitious. It seeks to better understand its groundwater reserves and ensure adequate recharge.

Local resources, local governance

Half our cities are wholly dependent on groundwater from local aquifers. Managing this invisible resource better, by building local capacity of both citizen groups and government, allows cities to have a reliable, cost-efficient system. If the city also gets real-time data, partly with crowd-sourced, citizen-led information, the system can become more sustainable over time.

This is equally true whether the city relies mainly on groundwater or also on surface water. Bengaluru gets Cauvery water pumped up at exorbitant cost from 100km away, but it also has 400,000, mostly private bore wells, according to one estimate.

While the government measures the inflow of river water, and estimates non-revenue water at close to 50%, there is no official record of the number of wells, or the volume of water pumped out daily. Without this data, the city cannot manage its groundwater resources and reduce the demand on Cauvery water, nor estimate the cost of collection and treatment of wastewater generated.

If all wells were metered, there could be a dialogue about volumetric tariffs on groundwater, just as there are on surface water. After all, groundwater is a common pool resource and consensus must be built to get users to bear the true ecological and social cost of using that water privately.

In the absence of good groundwater regulation, urban communities have developed models of decentralized groundwater governance. In Jakkur, Bengaluru, the community and state agencies together take care of a large lake of 50 hectares. A wastewater treatment plant sends in treated sewage to a wetland and from there to the lake. The lake is full through the year. Wells and bore wells all around have seen rising levels, creating local water supply around the lake.

Sometimes, the treated wastewater quality declines sharply, threatening the lake. The next step again points to information technologies and data collection. If wastewater treatment plants reported publicly on the volume and quality of water they treat and release, then communities such as those in Jakkur could do more to ensure the health of water bodies around them.

Environmentally smart, financially sound

Twenty-first century urban solutions must imaginatively include such community-based arrangements. This can force innovation and new policy too. Many parts of burgeoning Bengaluru do not get Cauvery water. In several residential layouts, previously dependent on fast depleting groundwater reserves, residents have come together to manage their water supply more holistically. They banned individual bore wells, adopted rainwater harvesting and recharge to augment supply. Then they put in metering and an increasing block tariff, quickly reducing demand by up to 40%. They also installed improved wastewater treatment plants and supplied treated water for non-potable use to the residents.

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Policy has pushed further in this environmentally and financially smart direction. It is now mandatory for all apartment complexes with 20 or more flats to implement decentralized waste management. Rainwater harvesting is also mandatory and as in Chennai, most homes have structures to capture rain or recharge the aquifer.

Fuzzy, but flexible

None of these are perfect or complete solutions. In fact, we believe it is hard to come up with one approach or even a small set of approaches that would adequately serve the needs of emerging urban India. Already, each city, depending on its geography, socioeconomic context, institutional setting, and growth pattern, seems to respond in its own way to supplying water.

This could become an advantage. If information architecture provides an environmentally sound understanding of water resources, and an appropriate mix of formal and informal governance mechanisms evolve as described above, imagine the possibilities. Local governments can create contextual solutions. State and central governments can provide the policy framework and the public financing. And urban India can move to safe, sustainable water for all.

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