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INNOVATIONS IN DEVELOPMENT

KARNATAKA THREE TOWNS PILOT 24/7 WATER SUPPLY Karnataka Urban Water Sector Improvement Project

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SUMMARY

Water from the tap 24 hours a day, seven days a week is a distant dream for almost all Indians. Even those fortunate enough to have a tap receive water for a couple of hours a day at most, and often only on some days a week. Everyone spends large sums to get water—the rich install expensive tanks, pumps, and filters, while the poor often do not have any water connections at all and have to queue up for hours at municipal standpipes, wait for tankers to supply them, or buy water from private sellers. While villages in Maharashtra, Punjab, and Uttarakhand are piloting 24/7 water supply, there is widespread skepticism that water can be provided continuously in India's urban areas.

Karnataka has now proved that 24/7 water supply is indeed possible, affordable, and sustainable in urban areas. About 200,000 people in Belgaum, Gulbarga, and Hubli-Dharwad are now getting continuous water supply under the World Bank-supported Karnataka Water Supply Improvement Project. The introduction of water meters and payment of tariffs based on water use has reduced citizens' private expenses for securing water, led to the generation of revenues for the municipal water service provider, and helped conserve water. The experience provides valuable lessons for other cities and states that strive to improve water supply for their citizens.



The Government of Karnataka (GoK) has been making significant efforts to improve services for urban residents. In 2002, it adopted a policy on Urban Drinking Water and Sanitation, among other initiatives. The policy aimed to ensure that all households willing to pay for services receive coverage, that minimum service levels are maintained, operations are commercially and economically viable, and that water resources are preserved.

In 2004, GoK, in partnership with the World Bank, launched the ambitious Karnataka Urban Water Sector Improvement Project (KUWASIP) to initiate reforms in the water supply and sanitation sector and demonstrate that it is possible to provide urban dwellers with safe water supply at sufficient pressure for 24 hours a day, seven days a week - something no city in India was able to do at that time. In the process, authorities would learn to address the political, social and technical challenges that would emerge in reaching and maintaining this level of service.

Five areas in the three cities of Belgaum, Gulbarga and Hubli-Dharwad (called "Demonstration Zones") were selected for piloting 24/7 water supply. These areas could be isolated hydraulically and included a cross-section of consumers, many different types of housing, and a range of topographies. Approximately 200,000 people, about 10 percent of the population of each city, were involved (see table 1).

An experienced private operator was engaged under a Performance Based Management Contract to deliver 24/7 water supply to these areas by undertaking the necessary improvements to the system through a structured management and engineering reform plan. The operator was to use best practices for pipe-laying and pipe-testing and to establish a customer billing and customer service center. Subsequently, the operator was to manage the system for an initial period of two years, ensuring that the quantity, quality and pressure of water was maintained. The operator brought considerable technical expertise.

Revenue for the services was to be collected by the municipal corporations based on tariffs set by urban local bodies using Government of Karnataka guidelines. Community participation was envisaged through nongovernmental organizations, appropriate feedback mechanisms were set up, and a strategic information, education, and communication campaign was developed.

Table 1: 24x7 Water Supply Demonstration Zones

Demonstration Zone	Approximate population covered
Belgaum (South)	39,988
Belgaum (North)	39,550
Hubli	53,810
Dharwad	37,739
Gulbarga	30,617
TOTAL	201,704

Preparation

The first task in the preparation phase was to determine the number of potential consumers and their likely demand for water. In addition, the condition of the existing pipes and other assets was to be assessed, followed by the hydraulic design of the new system. This was the most difficult stage as there was little information available. There were no bulk water meters, no household meters, and nobody knew where the water was going. Guesstimates placed water losses at 40 to 50 percent.

The operator took samples of the existing 15-to 20-year-old plastic PVC pipes and, having tested them in a laboratory, found that they would not be able to withstand higher pressures. The operator also found that many pipes had been installed at too shallow a depth

where they were being squeezed out of shape by the weight of the traffic plying on the road above. There was a similar challenge with the house connections, all of which were leaking or likely to leak once the mains were pressurized.

Based on field observations and computer analyses, the operator proposed to replace the entire distribution network, as partial replacement was not found to be technically feasible. This full replacement uncovered all the illegal connections, solved the challenge of leaking house connections, and facilitated efficient operation and maintenance (O&M) of the distribution network for years to come.

Implementation

Once the Karnataka Urban Infrastructure Development and Finance Corporation



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(KUIDFC) - the nodal agency for the project - had approved the investment plan, the operator was able to hydraulically isolate the demonstration zones, and install an all new pipe network, including service connections. They also installed bulk and consumer water meters, as well as devices to manage and monitor water quality, quantity, and pressure. In addition, a billing and customer service system was established along with a performance monitoring system.

Works were implemented either by directly procuring the material or through subcontracting, with efficient quality control standards. Competitive bids were selected, after a thorough evaluation to meet the highest technical standards.

Between 2006 and 2007, the new water distribution pipes were brought into service, and new household connections were made with high-quality links (ferrules) to the distribution network to avoid leakages. New meters were installed in all households and there was full metering of bulk water supply. Three types of water connections were offered, in response to the needs expressed by customers: a single standalone tap in the front yard of the property, a direct connection to the internal plumbing of the house, and a connection into the ground-level tank of the property. The Karnataka Urban Water Supply and Drainage Board (KUWSDB) ensured the supply of the required quantity of water from the reservoirs.

Works were coordinated with other utilities to ensure that telephone connections, electricity





supply etc. were not disturbed. It was also ensured that water supply to other parts of the city was not affected by these works; in fact, other areas also benefited from some of the improvements that were implemented across the city's water supply system.

Setting Water Tariffs

In the demonstration zones, all households, including the poor, were offered a house connection, and all connections were metered. Before the project, households with registered connections paid a flat rate of Rs. 1,000 per year (Rs. 83 per month), but many households did not have connections and many connections were not registered. A study on affordability and willingness to pay indicated that customers were willing to pay as much as Rs. 125 extra per month to receive reliable 24/7 water.

Criteria to pay for water were determined on the basis of the study. They were as follows:

Households able to pay would be charged based on the volume of water used, moving away from the flat rate being charged earlier regardless of the water consumed.

The urban poor would receive subsidized water supply. The project's "Pro-Poor Policy" identified the urban poor as those living in dwellings with built-up area up to 600 square feet, regardless of whether they lived in or outside a slum. For these households, the normal one-time connection deposit was waived and a lifeline supply of 8,000 liters per household per month would be provided at a concessional rate (fixed by the municipal corporations) of Rs. 48 per month. This covered about half the actual cost. Cumbersome procedures requesting various

documents were eliminated and ration cards and similar ID cards were considered sufficient proof of residence to provide a connection. To strengthen the sense of ownership, households had to cover the cost of the water meter, in installments. In the end, all households in the demonstration zones opted for household connections, and public standposts were essentially eliminated, contributing greatly to reducing leakages. While the policy contained provisions for public water kiosks, in the end they were not needed.

Paying for water consumed

Conscious of the difficulty of charging for water, project authorities sought to convince citizens that they would benefit from the project. They also sought to establish the habit of paying monthly water charges based on the quantity of water consumed, and to dispel the notion

that improvements in water supply would mean much higher tariffs.

To clarify people's concerns, a Water Tariff Awareness campaign was conducted by NGOs in the demonstration zones through newspapers, handouts, pamphlets and posters in various languages (Kannada, Marathi and Urdu). Door-to-door campaigns were conducted, group consultations and focus group discussions were held, as were meetings with elected representatives, the press, self-help-groups, and residents at both the ward and street level.

In addition, a Core Committee headed by the Commissioner of the City Corporation was constituted in each ULB to resolve issues. The Core Committee met weekly for a period of time to sort out issues as they emerged.



The demonstration areas have now had water 24 hours, seven days a week for over four years, proving that it is indeed possible to provide continuous water supply in urban areas in an affordable and sustainable manner. The project also proved that the poor are good customers and pay bills even more promptly than higher-income customers when they are provided with reliable service. A number of benefits were recorded:

Consumers are benefitting

Households received continuous water supply at the designed pressure, with water in taps inside their homes, even in third-storey apartments. The water which came out of the pipes was potable (additional chlorination facilities were built to ensure that the water was properly disinfected) and anecdotal reports suggest that health has improved.

A 2010 survey found that lower-income households were paying much less than they were paying earlier and for a far better service: about 20 percent of the customers in Hubli and Belgaum, 24 percent in Dharwad, and 21 percent in Gulbarga were paying the lifeline tariff of Rs. 48 per month.

Higher-income households saved on electricity costs as pumping to water tanks on the roofs of their houses was no longer necessary. The savings achieved in terms of the time and cost

of collecting and carrying water were also substantial; while no study on this has yet been conducted specifically on this project, a 2007 study estimated the value of savings at about \$4 per month.

In interviews and focus group discussions, women indicated that reliable water supply allows them to take up work outside the house, benefiting them financially. Beneficiary surveys showed an increase in school attendance in the demonstration zones. There is anecdotal evidence that property values in the demonstration zones increased by 40-60 percent.

Water consumption has reduced

Contrary to expectations, the provision of 24/7 water supply resulted in less water being consumed. People tended to conserve water when they were sure of reliable supply and were made aware of the value of water and cost of its provision. There were fewer leakages and tanks overflowing, water taps were no longer left open, and no extra water needed to be stored. Initial investments in the distribution network and efficient operations and maintenance also helped reduce water losses, with technical losses falling substantially, from an estimated 50 percent to 7 percent in the demonstration zones.

O&M costs are being covered

In 2003, before the project began, the three participating urban local bodies recovered less than half of the Operations and Maintenance (O&M) costs of their water supply systems. The project aimed to cover 80 percent of O&M costs by the end of the initial two-year maintenance period and achieve a billing and collection efficiency of at least 70 percent by the end of the project. In March 2011, when the

project ended, over 80 percent of consumers were paying their bills, enabling the municipal corporations to recover O&M costs, along with arrears. This was far more than in other Indian cities, where, according to 2010 data from 28 cities, 60 percent of consumers were paying their bills and 67 percent of O&M costs were being recovered (data from the Ministry of Urban Development's first Service Level Benchmarking Data Book.)



LESSONS

Several important lessons were learned: In addition to proving that continuous water supply does not require more water, and that social intermediation is critical for gaining support, the following lessons concerning tariffs were learnt:

Consumers need time to switch to the new system

In the Hubli Demonstration Zone, continuous pressurized water supply was provided from December 1, 2007, and charges based on the approved volumetric tariff were levied from January 1, 2008, under instructions from the Hubli-Dharwad Municipal Corporation (HDMC), only a month after the new service started. Accordingly, the operator issued bills to consumers in February 2008 for the water consumed during January 2008.

The hasty decision of HDMC to implement the volumetric tariff for 24/7 water supply within a month of beginning the service threw up some challenges. Higher-income consumers, who used larger quantities of water, were surprised by the large amounts of their bills, which were much higher than the flat rate they were used to.

Almost 700 consumers complained, arguing that they had not actually consumed such high quantities of water. A detailed analysis was carried out, indicating that 77 percent of the water billed was actually consumed, while

the remaining 23 percent was lost because of leakages in the old network and in consumers' premises, as well as through illegal connections.

It took several months to resolve the issue, and volumetric tariffs had to be reduced. The agitation was not only a setback for the Hubli Demonstration Zone but also sent the wrong signal to the Dharwad and Belgaum Demonstration Zones, delaying the introduction of water tariffs in these areas.

The key lesson learnt was that when an intermittent water supply system is converted into 24/7 water supply, consumers need sufficient time to (i) gain confidence about the reliability of the 24/7 supply, (ii) get an idea of their monthly water charges, and to (iii) control consumption and undertake any repairs in their internal plumbing to reduce leakage.

Learning from the experience of Hubli-Dharwad, the City Corporation of Gulbarga adopted a different approach: Consumers continued to be charged for several months at the ULB's prevailing water tariff, while receiving dummy bills based on the volumetric tariff for 24/7 water supply. This enabled them to gain an idea about the quantity of water they consumed and their likely monthly charges. By the time the new volumetric tariffs were introduced, consumers had been given sufficient time to adjust to the new system and the introduction proceeded smoothly.

Arrears should be de-linked from new charges

The smooth implementation of the volumetric tariff for 24/7 water supply in the Gulbarga Demonstration Zone was also due to the fact that the City Corporation of Gulbarga delinked the payment of arrears from that of new charges, and started a fresh billing system. This was wholeheartedly accepted by the community.

On the other hand, in the Belgaum and Hubli-Dharwad Demonstration Zones, where the new bills included old arrears, the charges were disputed by several consumers. Moreover, the arrears were collected by the private operator, and some did not trust that they would be passed on to the water utility.

Gulbarga's approach of starting a new billing system made it possible to take strong action against new defaulters. These were, however, few as consumers were generally satisfied with the improved services and found the new tariffs reasonable.

GOING FORWARD

With the proven success of 24/7 water supply in the three demonstration zones, the Government of Karnataka aims to extend service to other zones in the three cities. Several other cities in the state—among them Birur, Kadur, Mysore, and Shimoga—have also made plans to expand provision. Cities elsewhere are also seeking to replicate the approach and have applied for support to the Ministry of Urban Development under the national Jawaharlal Nehru National Urban Renewal Mission (JNNURM).



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