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# INDIA WATER REVIEW

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# INCREASING AVAILABILITY, INDIFFERENT QUALITY, PERSISTING INEQUALITIES: THE STORY OF WATER IN DELHI

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Serpentine queues for water have been a common sight in Delhi. With the onset of summer, residents of the city prepare themselves for dry taps, take recourse in water tankers, and, in the poorer areas, there are long queues for this precious resource.

Raised tempers and fights over water are frequent. It would, therefore, come as a surprise to know that Delhi fares quite well vis-à-vis other metropolitan cities in the country in the matter of water availability.

According to National Sample Survey data for 2008-09, 86.5 per cent of households in Delhi reported availability of water within the premises, with the corresponding figures at 55.5 per cent for Kolkata, 68.3 per cent for Chennai and 81.5 per cent for Mumbai.

There has been considerable increase in the availability of drinking water through taps in Delhi between 2001 and 2011. Delhi Jal Board is the main provider of water in the city.

In 2011, around 81.3 per cent of Delhi's population received piped drinking water supplied by the DJB, while the residual population accessed water from hand-pumps, tube-wells, wells, rivers, canals, etc.

In 2001, a much lower proportion, 75.3 per cent of Delhi's residents had received DJB supply. The coverage of drinking water supply expanded despite a sharp rise in the number of total households in Delhi during this decade, from 2.55 million in 2001 to 3.34 million in 2011.

The distribution of water, however, reveals a different picture. Across the districts, the distribution is not equitable, with peripheral areas receiving lower volumes per resident especially in the North, North-west, North-east and Southern districts. More importantly, the inequitable distribution is more apparent if we consider the slum residents and their access to water.

Delhi has a large slum presence with 0.384 million households, housing a population of just over 1.9 million. Among the households living in slums, only 51 per cent were reported to have access to water supply within the premises, according to the 2011 census data.

In the course of a Perception Survey conducted in 2013 by the Institute for Human Development (IHD), the unauthorised colonies, and regularized unauthorized colonies, in particular, cited water related issues as a major problem in their areas.

Jhuggi Jhompri clusters, too have rated water availability as 'poor' or 'very poor'. While the poor and under-privileged in Delhi do receive subsidized water, it comes at a price, in terms of time and cost.

As mentioned at the outset, hours of waiting in queues at water points and fights around water tankers are common in the poor settlements of Delhi. To this, if one adds the man-hours lost due to the time taken in accessing water while standing in long queues, the cost escalates even more.

Another important aspect of the inequitable access to water in the city and associated costs is the deficiency in quality of water, in some areas in particular.

The 2013 Perceptions Survey revealed that 47 per cent of the respondents faced problems related to water quality in their daily lives. In terms of localities, a higher proportion of respondents from the Walled city area (76 per cent), Jhuggi Jhompri clusters (59 per cent) and urban villages (56 per cent) reported issues with water quality.

Receiving dirty and foul smelling water was a common complaint, especially in the slums and similar disadvantaged areas.

The more affluent citizens of Delhi invest in technologies (such as RO and Aquaguard) to make water potable, but these gadgets are expensive propositions for the poorer households.

Thus, the challenges that face the government are two-fold, to meet existing water shortages and, to improve the quality of water available.

In 2011, the shortfall in water availability was around 165 MGD (million gallons per day), but the steady influx of people into Delhi makes the challenge of ever-increasing demand for water a particularly difficult one to tackle.

Shortage of raw water, fast depletion of groundwater and leakages compound the problem. In fact, a large number of revenue districts are reported to be precariously placed in terms of groundwater availability.

The poor quality of surface water of the Yamuna remains a concern given that it accounts for 70 per cent of Delhi's water supply. The stretch of the Yamuna running through Delhi is extremely polluted due to the uncontrolled flow of untreated sewage and the discharge of industrial effluents.

It is alarming that the Yamuna has the lowest Dissolved Oxygen (DO) and highest count of total Coliform and faecal Coliform numbers among all rivers in the country. It also has one of the highest Biochemical Oxygen Demand (BOD).

But, in order to address the twin challenges of quantity and quality, an associated challenge is to raise adequate resources to invest in the water sector.

A problematic legacy in this sector has been a large number of unmetered connections, due to which there have been huge revenue losses for DJB. Such unmetered connections comprised around 20 per cent of the total connections in 2011-12.

DJB also provides a high subsidy for poor consumers consuming up to 20 kiloleters (kl) per month, and free water for connections with monthly usage up to 6kl consumption.

Recent efforts of the government have aimed at reducing leakages by replacing old pipes, and installing bulk meters at water treatment plants to arrive at accurate estimates of the water supplied to consumers. In addition, consumption norms are being applied for those without functional meters. Consumers are now also allowed to buy meters from the open market.

Finally, there have been repeated attempts to clean the Yamuna.

The Yamuna Action Plan-I (YAP-I), one of the largest river restoration projects, covering Delhi and some parts of Uttar Pradesh and Haryana, was initiated in 1993 as part of a joint effort by the Governments of India and Japan.

In the second stage, YAP-II focused on building new sewage treatment plants and expanding the capacity of old plants in order to address the most polluted stretch in Delhi. It also brought in NGOs to work at the community level.

Now YAP-III has been approved for implementation of the selected projects by DJB. However, it remains to be seen whether Delhi's water woes will be solved in a satisfactory, and more importantly, in an equitable manner.

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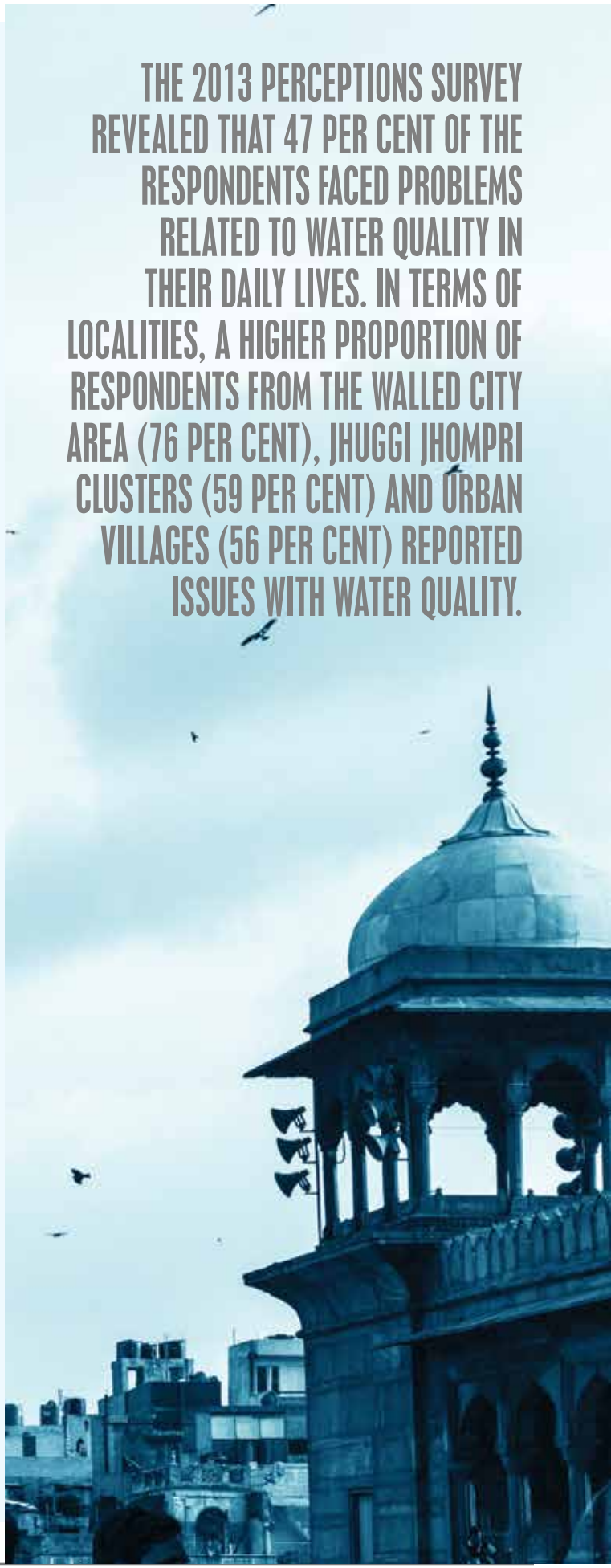
**THE 2013 PERCEPTIONS SURVEY REVEALED THAT 47 PER CENT OF THE RESPONDENTS FACED PROBLEMS RELATED TO WATER QUALITY IN THEIR DAILY LIVES. IN TERMS OF LOCALITIES, A HIGHER PROPORTION OF RESPONDENTS FROM THE WALLED CITY AREA (76 PER CENT), JHUGGI JHOMPRI CLUSTERS (59 PER CENT) AND URBAN VILLAGES (56 PER CENT) REPORTED ISSUES WITH WATER QUALITY.**



## Leaning on wastewater

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| Water supply from all sources | 840 MGD |
| Wastewater generated (80%) | 680 MGD |
| Treatment capacity of 21 STP plants | 604 MGD |
| Utilization | 350 MGD |
| Sewage treatment capacity by Dec 2014 | 684 MGD |
| Sewage treatment capacity by 2017 | 732 MGD |

crumbling old water pipeline system. It managed to replace about 250 kms of old water lines during 2013 while 330 major water leakages were repaired. DJB intends to continue with the exercise.

In an interesting project, Lt Governor Najeeb Jung, who currently heads the Delhi Government, had approved, in principle, the replication of the existing model of water ATMs running at Savda Ghevra in over 500 locations in a phased manner. The move is expected to supplement water supply in water deficit areas while providing people with easily accessible demand-based affordable supply system. (Read related story on water ATMs in later pages).

Even as DJB makes efforts to augment supply of water to the city, experts have cautioned that unless the Yamuna River is cleaned up and discharge of untreated sewerage stopped, Delhi will lose its major source of surface water. Currently, about 70 per cent of Delhi's water supply comes from the Yamuna.

To tackle the challenge of sewerage discharge in the river, the Delhi Government had announced ambitious plans in June this year.

The inter-linked project seeks to substantially bring down the pollution in Yamuna by treating effluent and wastewater discharge into the river. The comprehensive interceptor sewer project will ensure that water from drains is treated before being discharged into the Yamuna, for which laying of new intercepter sewer pipelines and making fully operational the existing lines, will be carried out.

For the entire project, DJB has estimated it would need to spend more than Rs 25,000 crore. Pollution in Yamuna has increased due to major expansion of the city, with its more than 1600 unauthorized/regularized colonies, 189 rural villages and its extension and more than 1000 JJ clusters. Several of these areas do not have sewerage facilities due to legal and institutional constraints.

Presently, there are 22 drains carrying wastewater, solid waste and industrial effluents directly into the Yamuna. This untreated sewage is being discharged into storm water drains and through them into the Yamuna.

"Plans are to lay of interceptor sewer in a length of 59 kms along the three major drains (Supplementary, Najafgarh and Shahdara) to intercept sewerage from around 190 subsidiary small drains and convey it to the nearest STP to ensure that only treated effluent is discharged into these major drains. Around 70 per cent of pollution load in the river shall be reduced by this effort", said an official statement of the Delhi Government.

Also, four STPs of 80 MGD capacity at Pappankalan (20 MGD), Nilothi (20 MGD), Delhi Gate (15 MGD) and Yamuna Vihar (25 MGD) are under construction and are likely to be commissioned by December 2014, making DJB achieve a total capacity of 684 MGD.

At the same time, to utilize all the STPs at their treated capacity, around 100 kms of trunk sewer has been rehabilitated and the rehabilitation of peripheral sewer in a length of 168 kms is under process, a project that will take another three years.

The sewage treatment capacity by 2017 will become 732 MGD by adding capacity at Delhi Cantt (8 MGD) & Coronation Pillar (40 MGD), said Tyagi.

DJB plans to encourage use of treated wastewater in and around the city for several non-potable purposes including irrigation and horticulture, use as cooling water in power stations, industrial use, for construction industries as well as for groundwater recharge.

"The same can be used for drinking purpose to some extent as is happening in Singapore with NEW Water, but it may be psychologically unacceptable in India", added Tyagi.

The water utility has managed to use as much as 142 MGD of treated effluent for various purposes and plans are to use an additional 50 MGD of treated effluent in industrial areas, maintenance of parks and for power plants. "About 20 MGD will be used by the Delhi Development Authority (DDA) at Pappan Kalan while the power plant at Bamnoi will use about 16 MGD, of this proposed 50-odd MGD", said an official.

DJB has also suggested a pilot project to DDA that basically encourages use of treated effluent. DDA had been using groundwater for irrigation and horticulture through 129 tube wells in Dwarka sub-city, which has been facing severe water scarcity. "DJB has suggested to DDA to use treated effluent for horticulture purposes and replace groundwater for potable use only", said Tyagi.

The water utility had checked the quality of groundwater in all the 129 tubewells and found that in 60 per cent of these wells, water was fit for potable purposes and could be supplied directly for drinking use after only a simple process of disinfection. Around 1.5 MGD of water is now being added for potable use in Dwarka while for the remaining tubewells, groundwater will be recharged.

To tackle most of the problems related to water management in Delhi, like inequitable distribution, transmission & distribution losses, and unmetered use of water, DJB has slowly, but steadily, moved towards roping in the private sector in a big way, said an official of a Delhi-based research organisation.

For undertaking the projects in wastewater management too, the Delhi Jal Board has plans to rope in the private sector. How well the private companies continue to receive such and other projects through the public-private partnership (PPP) delivery mode will, however, largely depend on the outcome of the CBI investigation. IWR