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What city must do to gain ground on water harvesting

Jayashree Nandi & Jasjeev Gandhiok | TNN

New Delhi: With temperatures soaring, the city is ever so eager in its wait for the monsoon. However, areas that have "over-exploited" groundwater are hardly prepared to catch the rainwater, except the New Delhi district. According to a recent research study by DU, New Delhi's groundwater table rose from "over-exploited" to "safe" zone between 2004 and 2011, mainly due to implementation of rainwater harvesting in buildings, roads and parks.

The DU team is still studying the case; so, they shared only abstract details with **TOI**. The study, being conducted by the department of Geology at DU and led by Shashank Shekhar, assistant professor, finds "positive change in stage of groundwater development" in the New Delhi district — from 171% in 2004 to 99% in 2009 to 90.40% in 2011.

Groundwater development is the total amount of groundwater extracted divided by net annual recharge in an area. "When groundwater development is more than 100%, it means it's exploited more than it is being recharged. It shows that groundwater is being mined," said Shekhar.

The district has also seen a general rise in depth to water level between 2005 and 2013, according to Central Ground Water Board reports. "This is mainly attributed to the successful rainwater harvesting and artificial recharge practices in Lutyens'. We propose that such practices be replicated in rest of Delhi, particularly in the southern parts where water levels have gone below 50mbgl — metres below the ground level — at many locations," the study being co-authored by Aditya Sarkar and Suman Kumar says.

Many buildings in New Delhi also have dual water supply, which helps them reuse treated waste water. According to NDMC, there are 200 rainwater harvesting pits in the district and it plans to build 98 more this year. NDMC has no data of how much water is being recharged by these pits, but they are being maintained and cleaned regularly, say officials.

Parts of south and southwest Delhi are seeing a drop by 1.7-2 metres in the groundwater table annually. It's alarming because most of these areas are in the "over-exploited" zone. TOI had reported in 2015 that locations like Tughlaqabad and Pushp Vihar are finding water at 60 mbgl and, to reach those aquifers, one has to dig as low as 80 mbgl — or lower. According to the Centre for Science and Environment, an amendment to Delhi's building bylaws in 2001 made rainwater harvesting mandatory for all new buildings on plot size of 100 sq m and above. "Due to this building bylaw, we do have structures built in. But their effectiveness is not monitored," said Sushmita Sengupta, programme manager at CSE. "We also need to have a city-level groundwater recharge plan in place. This is possible if the city conserves its lakes and wetlands," she added. DJB had announced last year that it would revive 100 water bodies in Delhi; however, work on only around 25 bodies has begun.

CGWB officials say Delhi needs a more area-specific plan. Delhi Jal Board, on its part, opened three rain centres last year — at Dwarka, RK Puram and Lajpat Nagar. The centres provide information on how to build rainwater harvesting pits. "People can discuss what kind of rainwater harvesting structure they require and the area available to them. The cost can range from Rs 2,000 to 80,000," said a senior DJB official.

ENVIRONMENT DAY JUNE 5

Why rainwater harvesting has failed to take off

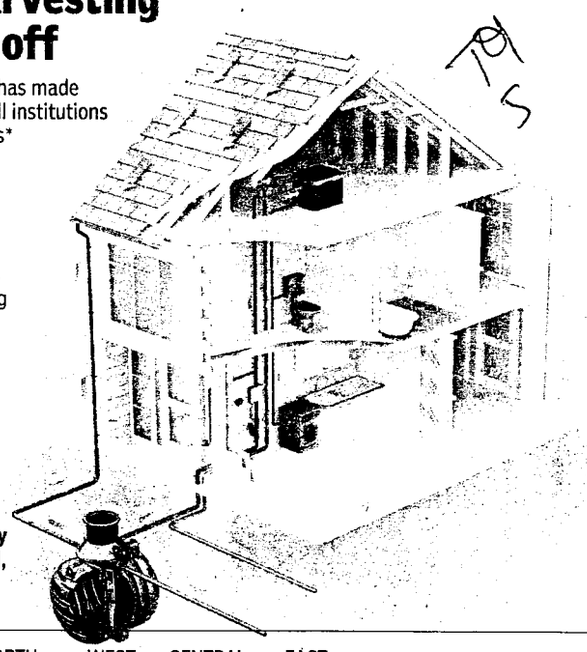
1 The Central Ground Water Authority has made rainwater harvesting mandatory in all institutions and residential colonies in notified areas*

The deadline for this was for March 31, 2002

2 While DDA building bylaws make it mandatory for municipal authorities to monitor whether rainwater harvesting structures have been created during sanctioning of a building plan, there is no supervision thereafter

3 For installing an RWH structure at home, you can either get the plan prepared by an external agency and get it approved by DJB, or get it made by DJB itself

4 **Why CSE thinks DJB's design is faulty** The agency doesn't consider the soil, hydrogeology or physiography of the area; it only recommends fixed designs



Different options and how much they cost

Recharge pit (rooftop area up to 100 sq m)
₹2,500-5,000

Running hand pump (rooftop area up to 150 sq m)
₹1500-2,500

Abandoned dug well (rooftop area up to 150 sq m)
₹5000-8,000

Recharge trench (rooftop area 200 to 300 sq m)
₹5000-10,000

Gravity head recharge well (more than 400 sq m)
₹50,000-80,000

Recharge shaft (for rooftop area more than 1500 sq m)
Rs 60,000-85,000

Source: DJB

Your choice needs to be governed by the water depth

Area & water range (below ground level)

	SOUTH DELHI	NORTH DELHI	WEST DELHI	CENTRAL DELHI	EAST DELHI	YAMUNA FLOODPLAIN
0						
10	**30-60** metres bgl					**5-10** metres bgl
20		**5-20** metres bgl	**10-15** metres bgl	**5-20** metres bgl		
30						
40					**10-30** metres bgl	
50						
60						

NOTE: * (South and southwest Delhi and adjoining areas like Faridabad, Gurgaon and Ghaziabad). This is also applicable to all buildings in notified areas that have tubewells

DEEPEST AREAS (40-60M BGL): **Pushp Vihar, JNU, Tughlakabad**

SHALLOW AREAS (2-5m bgl): **Siddhartha Nagar, Sukhdev Vihar, New Friends Colony, Okhla Phase-III**

➤ DJB doesn't recommend recharge for some E Delhi areas that have shallow groundwater levels

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CSR initiative pulls back lake from brink of extinction

Desilting, clearing land encroached for farming revives Kyalasanahalli lake

Chiranjeevi Kulkarni

BENGALURU: Rejuvenating a lake in 45 days may seem like a pipe dream against the "decades of work" by the government which leaves the lakes frothing. But a corporate social responsibility (CSR) initiative has shown the way.

The Kyalasanahalli lake before and after work began to rejuvenate it.

The 36-acre Kyalasanahalli lake, which looked more like a pond till two months ago, has seen a transformation in 45 days thanks to the timely work taken up by a city-based company.

Durgesh Agrahari of SayTrees said, on April 20, Sansera Foundation, CSR arm of city-based company Sansera Engineering, adopted "what looked like a pond" at Kyalasanahalli in Bommasandra. "They have worked relentlessly for the last 45 days to make it what it is today. It is not just the lake, but the surrounding area also has seen a lot of change," he said.

Anand Malligavad, head of Sansera Foundation, said, "When we first saw the lake, we knew it was a challenging task. We drew up a Rs four-crore budget and started working on it from Day One. We removed 3.6 lakh cubic metres of silt, increasing the lake's capacity 20 times. The width of stormwater drains connecting the lake has been increased from 1.5 feet to 10 feet," he said.

Noting that the residents of Kyalasanahalli supported the project, Anand said, "There are 200 houses in the village and when we explained the project to the residents, most of them chipped in."

K Y Sheshappa, a village leader, said about 12 acres of the 36-acre lake were encroached by residents for agriculture. "About 15 of us went to each house and explained the rules related to lakes. Those who had encroached the lake readily agreed to give up the land for development," he said.

"If the government had taken up the project, recovering the encroached land would have been tough. In 45 days, we have seen a miracle. Behind all that was hard work and commitment. Work did not stop even when it was raining. We have decided to maintain the lake in future too," he said.

On Sunday, NGO SayTrees brought together 1,600 volunteers to plant 4,000 saplings on the lake's bund and islets in the lake. "I was surprised to see the development that has taken place. It is a high quality work done in a very short time. Lakes in and around Bengaluru can be saved if more companies take such CSR initiatives," he said.

DH News Service

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With no pact, TS, AP to draw more water DCM

Unlike previous years, states have signed a deal

Ch. V.M. KRISHNA RAO DC
HYDERABAD, JUNE 3

Telangana and AP states may draw more water from their respective reservoirs in the coming Krishna flood season to serve more ayacut, with the principle of 'first come, first served' being applied.

Jurala will be the first major reservoir across the River Krishna that will be fully under the control of Telangana.

Likewise, Srisailam and Nagarjunasagar dam operations were entrusted to the governments of AP and TS respectively, by the Krishna River Management Board, with the stipulation that the engineering officials working there should obey the orders of the Board and necessarily comply with all instructions issued from time to time by it.

However, past experience showed that the officials had been following instructions of their respective governments rather than the Board.

Last year, when the Board directed the Srisailam dam authorities to release waters to downstream Nagarjunasagar, the TS government complained that the AP officials had deliberately kept the level of Srisailam above 854 ft and diverted more than the quota to Handri Neeva, Galeru-Nagari, Telugu Ganga and Srisailam Right Main canal through the Pothireddypadu head regulator.

There was also a dispute over the quantum of water, over and above the allocation, diverted to Rayalaseema region.

Though the KRMB had planned installation of telemetry system at vantage points along the River Krishna and canals throughout TS and AP, so far it has not been implemented.

There was also a dispute after TS complained to the Board that AP was not setting up the telemetry system at a point near Pothireddypadu head regulator which was agreed to by both the states. TS said that AP was shifting the point to some other place and claiming that the site was not correct.

Incidentally, there is no mutual agreement between the two states for the water year beginning from June 1, 2017, unlike in previous years.

The earlier agreement was that AP would get 512 tmc ft and TS 299 tmc ft of water and any further sharing, below or above this quantum, should be done using this formula. The agreement also dealt with project-specific as well as en-bloc allotment to both the states.

Using this as a tool, the TS government has been drawing more waters from Srisailam than from Nagarjunasagar, arguing that it can draw water from anywhere as long as sticks to its share limit of 299 tmc ft.

Similarly, AP argues that it will use more from Srisailam to cater to the needs of Rayalaseema projects. So far, there has been no punitive action by the KRMB against either state with regard to complaints on excess usage.

The Board has been repeatedly asking both the states to provide details of utilisation of Krishna waters for various minor irrigation projects and tanks so that it can allot water withdrawals among them and also take a decision on further allocations. To this, both TS and AP have not provided complete details so far.

TS irrigation minister T. Harish Rao, during a review meeting with officials, had told them to utilise the maximum quantum of water for various schemes in the erstwhile Mahbubnagar district from Jurala and Srisailam dam.

He also promised to provide water in kharif season for eight lakh acres in the same district as canals, distributaries and field channels have been made fully operational this year.

However the fact is that there are no specified allocations and working table for many new schemes in TS and AP.

"If there are more inflows in Krishna, there is no problem with usage or excess usage, when there are no inflows problems will crop up. We have to be more careful about this," said a senior KRMB official.

WATER STORAGE IN TS BETTER THAN LAST YEAR

L. VENKAT RAM REDDY | DC
HYDERABAD, JUNE 3

Telangana is among the few states in the country with good water storage in major reservoirs. The amount of water stored for the week ended June 1, 2017 is substantially more when compared to the corresponding period last year.

By contrast, the water in 91 major reservoirs of the country for the same period dipped by one per cent to 33.407 billion cubic metres, which is just 21 per cent of the total storage capacity of these reservoirs.

The total storage capacity of the 91 reservoirs is 157.799 BCM which is about 62 per cent of the total storage capacity of 253.388 BCM, which is estimated to have been created in the country.

AP figures in the list of states with lower storage than last year.

The latest data released by the Central Water Commission for the Southern region include AP and TS (two combined projects in both states), Karnataka, Kerala and Tamil Nadu.

There are 31 reservoirs in the Southern region under CWC monitoring with total live storage capacity of 51.59 BCM.

The total live storage available in these reservoirs is 3.89 BCM, which is 8 per cent of total live storage capacity of these reservoirs.

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Ggn daily draws 4cr litre groundwater illegally

Unauthorised Borewells Dug Up; Water Table Falls 16M In 10 Yrs

Shilpy.Arora
@timesgroup.com

Gurgaon: Four crore litres of groundwater are drawn out every day in Gurgaon through illegal borewells to meet a big gap in demand and supply. And that's only a conservative estimate as the city's population is increasing continuously.

Now, add to this people who will move into lakhs of flats in the city's new sectors along the Dwarka expressway, Southern Peripheral Road and Sohna Road in the next few years and thousands more who currently live in unauthorized colonies. This shows why availability of water could soon become the single largest challenge for the city, probably bigger even than air pollution.

For the record, the city's groundwater fell 16 metres in 10 years to 34.84 metres below ground level in 2015, from 18.77 in 2005.

Last week, a study jointly conducted by the Centre for Science and Environment (CSE) and Gurgaon First under the aegis of MCG on the city's rapid growth and the strain that has put on its resources, feared Gurgaon would turn into a "living hell" if immediate steps were not taken to make this growth sustainable.

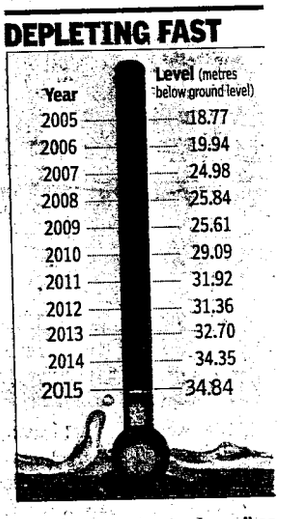
Water would be a good starting point.

Gurgaon needs at least 270 MLD (million litres per day) of water for household use. Industrial and commercial establishments need another 99 MLD, making the city's total requirement 369 MLD. This is with an estimate that the city's current population is 20 lakh, which in reality is likely to be more.

Water is supplied to the city from two treatment plants — Basai and Chandu Budhera. While Basai provides nearly 225 MLD, Chandu Budhera supplies 99 MLD. Registered tubewells extract about 5 MLD. So there is a gap of 40 MLD, which is met by water tankers through illegal borewells. That is 4 crore litres, which is equivalent to the need of nearly 3 lakh people going by the standard per capita consumption of 135 litres a day.

Even though a 2012 high court order prohibited extraction of groundwater by setting up borewells, for both construction and residential purposes, extraction is rampant in the city. TOI found out there are over 40 water tanker services in the city. And this, despite authorities claiming to have banned private water tankers some four years ago.

But tankers have become a part of daily life because of the faltering water supply, of which this summer has thrown up ample instances. "Huda supply doesn't meet 60% of the demand in summers. We, therefore, have to fall back on groundwater. We try to meet the demand through registered borewells, but it's difficult to manage without private water tankers," said R S Rathee, president, DLF Qutab Enclave RWA.



Subhash Piplani, a former sub-divisional officer at Huda, said, "The demand-supply gap is filled through illegal ground water extraction. What would you do when you don't get water supply? Wouldn't you call tankers? These tankers are called by people as authorities have failed to meet demand."

According to a Central Ground Water Authority (CGWB) report released in 2016, Gurgaon is situated in a semi-arid area. Rain is the main source of recharging groundwater. But as a result of heavy urbanisation and industrialisation the run-off from rain goes straight to sewers or stormwater drains, reducing the contribution of rainfall to groundwater recharge.

"Net annual withdrawal is more than net annual recharge. During the last 20 years, groundwater level has declined across the district, at a rate of 0.77-1.2m per year. So there's a need to take measures to arrest the fall in the groundwater level. Recharging groundwater artificially is one such measure," said the report.

Presently, the city has only 1,000 rainwater harvesting pits that recharge groundwater for not more than 20-25 days a year. "Ever since Gurgaon was founded, private establishments and developers, and now even residents, have been guzzling groundwater without realising the need to harvest the resource. Even if we harvest half the rainwater the city receives during the monsoon, our dependence on groundwater will fall drastically," said Vivek Kamboj, a city-based environmentalist.

Some activists raised the need for authorities to provide basic scientific tools for rainwater harvesting. Sushmita Sen, deputy programme manager at CSE, said, "There is a need to adopt a sector-wise rainwater harvesting system. Authorities, NGOs and residents should come together to ensure rainwater is harvested properly and all scientific tools are made available for rainwater recharge."