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Rain alone can quench Bengaluru's thirst

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In the background of the Cauvery water dispute+ , a worried Karnataka government and the Bangalore Water Supply & Sewerage Board (BWSSB) may be mulling over alternatives to quench the thirst of a burgeoning Bengaluru. But Indian Institute of Science (IISc) researchers have revealed that the city could be left with a hefty surplus with rain harvested water stored in lakes, and treated sewage water.

"If you consider both the natural run off and treated water, Bengaluru has surplus water of 30 thousand million cubic feet (TMC) at its disposal, which has to be used judiciously without resorting to any mismanagement of the resources," Dr TV Ramachandra, who led the study by five researchers of IISc's Centre for Ecological Sciences (CES), told Bangalore Mirror.

This means, even if the city utilised only the 30.80 TMC of water generated through rainwater harvested and sewage treated water, the city would still be left with a surplus of 10.30 TMC.

Meticulous analysis along the Vrishabhavati Valley, Koramangala-Challaghatta Valley and Hebbal-Nagawara valley by the experts has revealed that Bengaluru actually does not face any water problem and that the water scarcity is the result of mismanagement of available resources by the decision-makers.

"The annual water yield, through natural rains, across Bengaluru is 14.80 TMC per year. The actual demand by the domestic sector is about 20.5 TMC per year. Interestingly, Bengaluru generates about 20 TMC of sewage, of which 16 TMC can be recycled and reused," Ramachandra said.

Calculating the various geographical parameters like rainfall, storage capacity of lakes, encroachments along the catchment, and treatment of sewage, the researchers have suggested that if our policy-makers adopt the five R's - rejuvenate, retain, recycle, reuse and responsible methods - for optimal management of water, the so-called scarcity of water across Bengaluru could be a thing of the past, and every citizen could be fed with surplus amounts of water for their daily usage.

Analysing Bengaluru's rainfall over 100 years, the scientists have concluded that Bengaluru gets about 73 per cent of its total water requirements from annual rains (surface run off) alone while the remaining can be met by the recycling and treating sewage water.

3 valleys provide 73 % of water

As per the experts' findings during their study - titled 'Water Situation in Bengaluru' - published under the ministry of environment & forests' (MoEF's) Environment Information System (ENVIS) in September 2016, a copy of which is with Bangalore Mirror, as much as 73 per cent of water required by Bengaluru can be obtained from rains alone.

The report is co-authored by Vinay Shivamurthy, Dr Durga Madhab Mahapatra and Dr Bharath H Aithal of IISc. "Bengaluru annually gets about 787 millimetres (mm) of rainfall. While the Vrishabhavathi valley yields 7.32 TMC of water (49.5%), the Challaghatta Valley and Hebbal valley generates 5.2 TMC (35.2%) and 4.2 TMC (15.3 %), respectively. But the city limits get a share of 14.80 TMC.

Even if each Bengalurean consumes 150 litres per day, the domestic demand would be around 20.05 TMC every year (1,573

million litres/day, or MLD). This itself suggests that about 73 per cent of IT city's water can be met by harvesting the rains," Ramachandra said.

While consuming about 20 TMC of water every year, Bengaluru generates 20.05 TMC annually. "Most of the sewage that gets into the river system can be treated effectively using a scientific mechanism. Using techniques like complete removal of nutrients and chemical contaminants, about 16 TMC of sewage can be reused. IISc
has also practically demonstrated better treatment system by integrating secondary STPs (sewage treatment plants) with constructed wetlands and algae ponds at Jakkur Lake, which has been hailed by many international experts," explained yet another researcher.

Increase the capacity of lakes

The scientists have also suggested using Bengaluru's lakes by harnessing rainwater and storing it in them for the entire year. "Way back in 1800, Bengaluru's lakes had a storage capacity of 35 TMC. Our ancestors had built them and interlinked it in such a way that their storage could meet water demand for the next 200-300 years.

However, considering the current status of lakes in and around Bengaluru, they can store only about 5 TMC of water. But over the years, deposition of silt has reduced the storage capacity to a mere 1.2 TMC. There are about 81 lakes in Koramangala valley, followed by 56 in Vrishabhavathi and 46 in Hebbal valley. What is worrying is the considerable increase in built-up area around Bengaluru.

What was just eight per cent of built-up area in the 1970s, has now gone up to 77 per cent in 2016. By 2020, it is expected to go up to 93.3 per cent, prompting the authorities and the government to swiftly resort to action.

"Government does not want our findings"

While the experts' findings has thrown light on the situation of water availability of Bengaluru, the hub of global investment off late, the state government seems to be in no mood to accept the findings. The researchers have refused to write to the state government about their findings, instead choosing to place the study in the public domain for citizens' introspection.

"The scarcity that we are experiencing is due to the mismanagement and irresponsible use of resources by policy-makers in assessing and using our resources. There is no decline in the rainfall across Bengaluru and it is only passing as unchecked run off. In fact none of them (in the state government) is interested in our data as they always find our studies as conflicting facts. What we are advocating is the retention of lakes, wetlands, rejuvenation of these watershed areas, recycling of sewage and responsible use of available water. We hope that the citizens of Bengaluru take note of these facts and exert pressure on the decision-makers to ensure proper utilisation of resources," Dr Ramachandra said.