

# Killing lakes for a living

The City's lakes are increasingly getting contaminated due to inflow of untreated sewerage; encroachment of the lake beds by real estate developers is making matter worse. The crisis in the making calls for immediate intervention.

The irony couldn't be starker. At a time when the Cauvery water issue is on the boil and water disputes are hitting national headlines, Bangalore continues to give scant regard to critical natural water resources: Its lakes. And when the civic agencies are struggling to address the mounting garbage menace, the lakes remain polluted, contaminated by the unbridled flow of untreated sewerage.

The major lakes of Bellandur (Koramangala-Challaghatta valley), Byramangala (Vrushabhavathi valley) and Hebbal-Nagavara valley are soaked in sewerage and have turned toxic. The water is so badly polluted that it can be consumed neither by humans nor animals.

The increasing level of nitrogen and phosphorous in the waters of almost all the lakes has been confirmed by scientists at the Energy and Wetland Research Centre (EWRC), Centre for Ecological Sciences (CES) and Indian Institute of Sciences (IISc). The study conducted by a team of researchers headed by senior scientist Dr T V Ramachandra of EWRC says that the water in all the major lakes is mixed with sewerage water, leading to anaerobic conditions (no oxygen in water).

"There is high amount of nutrients available in the water. Due to this, there is profuse growth of macrophyte (invasive species like water hyacinth). When this happens, no sunlight will penetrate into the water and there will be no growth of algae. Fish and other aquatic life will cease to exist," explains Dr Ramachandra.

The contamination has also affected the groundwater in the City. The study has found the presence of nitrate and e-

**Many lakes on the City outskirts are contaminated with heavy metals released by industries and the vegetables grown here are not edible.**

coli bacteria. "Both are present in high levels. It means sewage entering the lakes has contaminated the ground water. The health of the people drinking the water will be affected," says Durga Madhab Mahapatra, a researcher who was part of the study.

He said sewerage was turning lakes into breeding grounds for mosquitoes. In places around the Bellandur Lake, people can't even keep their doors open, because

of this. Diseases such as chikungunya have come rampant there, he added.

According to Mahapatra, the change is happening so fast that in some lakes, the content of ammonia which was about 30 parts per million (ppm) has now reached 70 ppm. The aquatic life has virtually disappeared.

Many lakes on the outskirts of the City are contaminated with heavy metals released by industries in the vicinity. The

plants uptake these heavy metals as is evident from the contamination of vegetables at Varthur and Peenya, Dr Ramachandra informed.

If the pollution levels had been low, the water bodies themselves would have been the solution. The lakes are capable of treating the sewerage naturally to a certain extent. However, the situation is so worse that the lakes have exceeded their capacity.

"Nature will treat sewerage. But we are letting sewerage in such huge quantity that it is crossing the threshold of the lakes' ability to treat," says a scientist. Bellandur Lake, arguably the city's biggest and most polluted water body, does its job to treat water during monsoon till winter sets in.

The City's sewerage flows in three directions and the lakes in all these valleys receive one-third of Bangalore's sewerage. Several buildings have come up on the catchment areas of Bellandur Lake and the wetland is in danger of losing its existence. Based on remote-sensing data, the study has found that the lake is being filled up in most places.

The study says that the lake's ability to remove pollutants has decreased to a large extent due to the anthropogenic activities, which include conversion of the watershed area into residential and commercial layouts.

"The conversion of the nearby wetlands and alteration of the landscape topology by filling up the low-lying areas and levelling them has affected the hydrologic regime of the lake," says the EWRC study.

## Panel suggests

The committee constituted by the High Court made the following recommendations:

- Survey lakes, remove encroachments and fix boundary stones
- Maintain 30 metres buffer around a lake, ensure no construction around it.
- Carry out annual inspection of lakes
- Develop selected lakes for augmenting water supply to the City as Bangalore cannot draw Cauvery water beyond its allocation
- Set up sewage treatment plants instead of diverting sewage, which will lead to drying up of lakes
- The BDA should not acquire lake areas and form sites. It should survey the lakes, stormwater drains (SWDs) and make provision for buffers. SWDs and underground drains are to be laid before sites are allotted

## HC directions

The High Court accepted the report in July 2011 and a division bench in its order dated April 11, 2012, said the report will be applicable to the entire State and issued several directions like:

- Sewage or garbage will not be diverted to the lakes and tanks
- The Revenue Department should survey the lake area
- The Forest department shall undertake planting of the saplings after getting the necessary technical opinion from the experts concerned



## Depredation in the name of development

Tankers supplying water are a common sight in Uttarahalli, though it has five huge lakes. Dore Kere, Subramanyapura Lake, Uttarahalli Lake, Goudanapalya Lake and Gubbala Lake dot the area. However, the precious water bodies are on the verge of extinction, despite crores of rupees being spent on their revival.

The greed and shortsightedness of the people are to be blamed for Uttarahalli's current plight. People pedalling bicycles with empty plastic pots tied to them, in search of water, is a routine in the area. Water tankers bearing the posters of Bangalore South MLA M Krishnappa and Uttarahalli BJP corporator Ramesh Raju supply water free of cost to the people of Uttarahalli ward. The tragedy is, water is supplied to the slum-dwellers on the banks of Subramanyapura Lake as well. The lake had pristine water just two years ago. The 'water business' has continued into the rainy season this year due to the rainfall shortage, which broke a 42-year-old record.

The borewells dug on the banks of the lake once had potable water, but not any more. The catchment area of the lake and the stormwater drain leading into the lake have been encroached. Sewage flows in the stormwater drain and weeds have further choked it. The lake has become synonymous with a septic tank, emanating unbearable stench. The Uttarahalli Lake is severed from its catchment area, while sewage abounds the catchment areas of Dore Kere, Subramanyapura Lake and Goudanapalya Lake, choking them completely. Rampant encroachment, inaction of the BBMP officials and revenue authorities, and the silence of the public representatives have proved fatal for the water bodies. This, however, does not deter the BBMP from spending Rs two crore to construct a new lake near Poornaprajna Layout.

The Palike recently undertook rejuvenation of the valleys of the five lakes and their catchment areas, following a direction from the High Court of Karnataka. It carried out a survey of the catchment area of the Subramanyapura Lake, only to slow down the work later. The reason was obvious. A senior officer involved in the project said his work was almost finished, but suddenly pressure mounted on him to give up the work. Complaints to the local corporator, Karnataka State Pollution Control Board and the Bangalore Water Supply and Sewerage Board about sewage entering the lakes did not yield any result.

Chandrashekhar, a resident of Gubbala, laments: "We have no concern for the lakes and valleys, which are the lifeline of Bangalore. We will perish if they are allowed to die. We had rivers like Vrushabhavathi and Arkavathi, which we have killed and we may not hesitate to choke Cauvery too. There is no one to take up the issue."

G Manjushainath



Dore Kere Lake



Subramanyapura Lake



Garvebhavipalya Lake.



Madivala Lake. DH PHOTOS: KISHORE KUMAR BOLAR, SRIKANTA SHARMA

## Citizens' initiative on Madivala lake comes to nought

Vivek Kumar, who resides close to the Madivala Lake, used to play with his friends on the lake bund once upon a time. Now, the boys have grown up, but Kumar's generation next does not have that luxury. He regrets that the lake has become a cesspool and a garbage dumpyard.

"It is very unfortunate that such a beautiful lake has turned into a sewage tank. The government has failed miserably in protecting the water bodies of the City,"

he says. The Madivala Lake is one of the biggest water bodies in the City and is spread across more than 200 acres in BTM Layout. Although the lake looks pristine at the outset, it is dying a slow death. What is more appalling is that despite a number of reports on lake conservation being submitted, the government is yet to wake up to the need for the conservation of lakes. The Madivala Lake comes under the jurisdiction of the Forest department, which receives annual

grants for routine maintenance of lakes. A Vidyashankar, president of the Kuvempunagar Permanent Residents' Welfare Association, says that grants received by the Forest department are mainly used for de-weeding the lake.

"Annually, more than Rs one crore is allotted for the purpose of reviving the lake. But the amount is spent only for removing the weeds. The sewage treatment plant is not working effectively, which is allowing raw sewage to enter the lake.

The lake is not protected enough," he points out.

The lake had become contaminated to a large extent by 2008 itself. But with citizens' active involvement, the lake was revived, following which boating facilities were launched. However, the facility is now discontinued and sewage water continues to fill the lake.

Nijaguna Murthy, who stays very close to the lake, complains that the sewage treatment plant is not working. The Ban-

galore Water Supply and Sewerage Board (BWSSB) has set up the plant, without bothering to check if it is in working condition, he said.

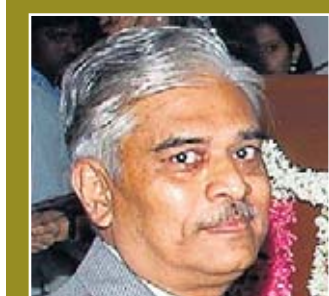
"The Forest department was sanctioned an amount of Rs 1.2 crore to maintain the lake, but no work has been taken up so far. The lake continues to be polluted," he says.

Chief Conservator of Forests Veeranna, who is in charge of the development of Madivala Lake, says the department is yet to receive annual grants for this year for maintenance work.

"A proposal to lay a cycling track at a cost of Rs 20 lakh was made two months ago. But there has been no response from the government so far. It was also proposed to increase the capacity of the sewage treatment plant from 4 mld to 6 mld. We are yet to receive a reply," he said.

The lake is rich in flora and fauna and is known for its large number of migratory birds, including spot-billed Pelican which migrates to the lake during November-December.

Poornima Nataraj



Discharge of solid waste and non-biodegradable plastics into water bodies causes irreversible damage to soil, water and air quality. They can contaminate the air and ground or can reach and contaminate stormwater drains, canals, lakes and groundwater, threatening our drinking water supply.

DR KESHAV BULBULE, scientist



We have been monitoring the City lakes for the last 10 years. The situation is going from bad to worse. There are several new technologies which are low cost and can be utilised for treatment of sewerage entering the lake. Only a sincere effort can bring about the changes required.

DURGA MADHAB MAHAPATRA, researcher, E&WRC, IISc

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