

STATE OF RESTORED LAKES

Lakes: Beauty minus quality?

Recent water quality studies of the city's restored lakes have found glaring gaps in maintenance, sewage treatment, encroachments and solid waste dumping. Faulty restoration methods are now in sharp focus



RASHEED KAPPAN

ly detergents and organic wastes; industrial effluents and agricultural run-off contribute to higher levels of phosphates in surface water."

If restored lakes once gave people the confidence to consume the water, poor maintenance gave that consumption a dangerous dimension. "Consumption of polluted water causes cholera, typhoid fever, diarrhea, vomiting, headache, stomach ache, dizziness," the report warns of the health hazards.

As the Jakkur lake experience has showed, constructed wetlands can potentially regulate water quality and quantity, control nutrients, recharge groundwater

and erosion, regulate the microclimate and mitigate floods.

But, as the study notes, wetlands require regular maintenance. This was seen clearly lacking in the restored lakes.

Unfit for drinking

Dividing the 45 lakes it monitored under five categories of water quality, the IISc research team had concluded that none of them was fit for 'drinking.' This was confirmed by a CSIR-National Environmental Engineering Research Institute (Neeri) study, which found that 18 of the 45 lakes it tracked had water quality fit only for domestic and irrigation purposes.

On the directions of the High Court, the Palike had commissioned the Neeri study to assess Water Quality Index (WQI) of 206 city lakes under its jurisdiction. The study's interim report was released recently.

Categorising WQI under five heads – excellent, good, poor, very poor and unsuitable for drinking –, the study chose to certify 18 lakes as 'good.' However, the IISc study focused on 24 lakes found to be with 'very poor water quality' fit only for irrigation with restrictions.

This meant their WQI score was between 76 and 100. Among these were the Puttenahalli, Uttarahalli, Kasavanahalli and Kaikondrahalli lakes. Only those water bodies with an index score less than 50 are considered fit for drinking.

Sampling issues

How can two studies, both from institutions of repute, show different readings? "Testing can go wrong only in sample collection. The readings depend a lot on where the sample is collected, at what time," notes Friends of Lakes co-founder V Ramprasad.

Composite sampling, he informs, is a process where the samples are collected from the same spot at different times. The samples are mixed and the final composite sample is sent for testing. This method should be repeated at the lake's inlet, middle of the water body and outlet. "Weather

conditions can also affect sample data."

Most studies are clear that rejuvenation efforts should be mandatorily followed up with measures to let in only treated water. This implies building Sewage Treatment Plants (STPs). However, in practice, sewage is diverted to the lakes downstream.

Sewage diversion

Preferring anonymity, a citizen activist involved with Bellandur lake conservation efforts draw attention to this diversion problem on a massive scale. "Until now, I was under the impression that the restored lakes are in good shape although they divert their sewage to Bellandur lake. Sewage has to be treated locally and only treated water should enter those lakes," the activist notes.

"There are many issues with restoration. Diverting sewage leads to the lakes drying up since monsoon rains are not enough to sustain the water levels. We need to build the resilience of the lakes, treat them to the maximum extent," notes Elangoven Kulandaivelu from Whitefield Rising.

While preparing Detailed Project Reports, he says, only civil engineering inputs are taken. "Environmental, hydrogeological aspects are ignored." He also raises questions about the efficiency of the existing STPs linked to restored lakes.

Recommendations

Seeking a 'sensible rejuvenation plan' to decontaminate the eutrophic lakes, the IISc report recommends that the accumulated silt be removed completely. Removing only a portion of the silt that is required for shoreline work will not do.

The report also emphasizes on fencing the lakes. Treatment of wastewater through constructed wetlands and algal ponds (similar to Jakkur lake) is another key recommendation.

This, the study notes, will help in removal of nutrients.

To keep a lake alive, restrictions on dumping solid and liquid waste should be in place. "Allow only treated wastewater to enter the lakes. Any alteration of topography in lake catchments should be banned."

Encroachments and mushrooming of massive apartment complexes around lakes have only hastened the inflow of pollutants. To address this, the study recommends that a 30-75m buffer be strictly maintained around the lakes, and construction activities in the valley zones be totally banned.

Threshold on development

The study also wants a threshold on high-rise buildings in the region. "There is a need to protect valley zones considering the ecological function," it notes, drawing attention to these areas marked as 'No Development Zones' in the Comprehensive Development Plans of 2005 and 2015.

Wet dredging of the sediments deposited in the lakes, installation of fountains / aerators in the water bodies, a ban on phosphate use in detergents and public awareness and participation are among other recommendations.

ELANGOVEN KULANDAIVELU
Whitefield Rising

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NIKUNJ SABHARWAL
Statistician

Even as restoration talks are on, look at the multiple drainage lines that open up in Bellandur lake, leading to foaming. The lake even caught fire in the past because of the chemical waste and the construction debris which are dumped into it.

KHYATI MEHTA
College student

There has been some development in terms of infrastructure around the lakes. But the water quality in many of the restored lakes has not improved.

Key steps of lake rejuvenation by BBMP

1. Fencing around the lake to prevent encroachment and garbage-dumping
2. De-weeding / removal of macrophytes through manual and mechanical operations
3. Dredging to remove contaminated sediments deposited in the bottom of the lake
4. Creation of islands inside the lake to aid resting, roosting and nesting of birds
5. Walkways / jogging paths beyond the high-water mark to help recreation and tourism
6. Afforestation / planting of trees and bushes of native species in the lake area
7. Construction of idol immersion tanks to prevent water pollution of main lake
8. Construction of STPs to help local waste water treatment, entry of treated water to lake

Raw sewage inflow

So why did the water quality, measured on multiple parameters, deteriorate to such an extent? The primary reason was found to be the unchecked inflow of untreated, raw sewage. "Domestic wastewater, main-

tenance and incassant urbanisation has been a disaster for the lakes of Bengaluru. While Bengalureans rejoiced when BBMP went on a lake rejuvenation drive earlier, a recent study by IISc shows that only six lakes have good water quality.

In fact, some of the lakes have even shrunk to the size of a puddle. "The water is less. At this time of year, there is supposed to be water but there is a lot less now. No one comes in here to do anything about it," says Chandran (name changed), a grass cutter at Kogilu lake.

Kogilu lake is one of the 24 listed under those with poor water quality by the IISc report, first published in *DH*. These lakes were restored by the BBMP. Bitter stench and toxic gases arise in the cases of those lakes that do have a considerable amount of water.

There is a stream of drainage that runs parallel to the road from where one enters Kogilu lake. But it is unclear if there is any path that connects the lake with this stream. "I am not sure if this stream drains into the lake," says Raghu (name changed), a regular jogger at the lake.

However, he notes that there is no attempt from any authorities to maintain the water body which is now largely covered by algae. "Nobody ever comes here to clean or maintain this lake. It is so polluted. I'm sure they receive funds to maintain but nothing happens here. There isn't any as far as I've seen."

Residents of Thirumenahalli are not very happy about their neighbourhood lake too. While a residents complained about the size of the water body, he also notes that there is strict regulation against any kind of waste disposal in the lake.

"There is no water in the lake, so there's

no question of clean water. The last time I saw water in the lake was months ago. But no one discards waste or garbage there. There's a guard who would prevent anyone from doing that," says a resident of Amigo apartment near Thirumenahalli lake.

"Earlier, another apartment's sewage pipes used to be directed into the lake, but the police soon got them to stop the drains. Now there are no other external sources that drain into the lake," says another

resident.

However, this has not made things better for him or his neighbours as there is now a body of drainage water that has formed another "lake" near his apartment. The apartment stands between Thirumenahalli lake that has more area covered with grass than water and a water body that is black in colour.

The inefficiency of civic authorities in the maintenance of the city's precious

water bodies is a concern that many in the city share. Soumya Bhuptani, a resident of Uttarahalli, recalls her school days.

"Many migratory birds used to come near this lake when I was in 9th grade which was I guess in 2012. Now they don't, due to the pollution. Because aquatic life itself is affected at that level that birds cannot feed on the fishes in the lake," she says.

Taking a stroll on the walking path around the lake, she says, is a "difficult

task because the water stinks like gutter." Yet, children in the underprivileged neighbourhood bathe, people wash clothes and utensils in the slimy lake that is covered in a green sheet. There are even those who consume fish bred in the polluted lake, leading to deaths in the past, she recalls.

A disappointed Soumya notes that the BBMP does not do anything about it. "There's no cleaning done. This lake used to be under an NGO (United Way Ben-

galuru) earlier, and until then it was pretty good. The NGO gave up, the government didn't do anything and BBMP of course isn't maintaining it anymore. Thus, the polluted water."

Uttarahalli Lake was rejuvenated in 2012 with the combined effort of BBMP and United Way Bengaluru. Aquatic flora and fauna thrived for some time in the newly rejuvenated lake. It is now under the list of lakes with very poor water quality.



Thirumenahalli lake



Puttenahalli lake



PEOPLESPEAK

Rejuvenated lakes continue to stink years after restoration

ANAND SINGH AND MOHAMMED ASIF

Rapid and incessant urbanisation has been a disaster for the lakes of Bengaluru. While Bengalureans rejoiced when BBMP went on a lake rejuvenation drive earlier, a recent study by IISc shows that only six lakes have good water quality.

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