



While the air we breathe is highly polluted, Bangalore's water bodies are equally contaminated. In the second of a three-part series, **Bosky Khanna** focuses on independent studies conducted by various agencies to revive the city lakes and improve their water quality

Studies to tackle water pollution fail to give the desired results

RAKESH RAVINDRAN

Although many independent studies have been conducted in the state on pollution and ways to tackle it, the results at the ground level are minimal.

The Bangalore Water Supply and Sewerage Board (BWSSB), Lake Development Authority (LDA), Indian Institute of Science (IISc), and Karnataka State Pollution Control Board (KSPCB) have made a lot of efforts in this direction.

Recent studies by the Centre for Ecological Sciences (CES) of the IISc reveal that the quality of water is deteriorating and all lakes are polluted with sewerage, coliforms, bacteria and various pathogens.

Speaking to *DNA*, Prof TV Ramachandra, Energy and Wetlands Research Group of CES, said the major polluters of lakes, drains and underground water are industries, old sewerage lines, which are connected to lakes, and storm water drains. Apartment owners, tankers, truckers, landfill sites and hospitals too are culprits in poisoning the city's water bodies.

"BWSSB should treat water and let it into drains and lakes. The capacity of the treatment plants is much lower if we take into account the massive amount of effluents discharged into lakes and storm water drains. For instance, in Bellandur lake, the sewerage dumped is 500mld, while the treatment plant's capacity is only 240mld. The environmental illiteracy among people and officials is 90%.

FACTS

110
IS THE NUMBER of water bodies in greater Bangalore in 2007 against 265 that existed in 1972

31
IS THE NUMBER OF sewerage treatment plants to be set up

90%
IS THE ENVIRONMENTAL illiteracy rate among city people and officials

2012
IS THE DEADLINE set to restore the water quality in Bangalore

It is important to collate all data and formulate stringent steps to solve the problem," he said.

IISc recently held a brain-storming session on 'Conservation and management of urban wetlands: Strategies and challenges'. It suggested 33% buffer zone, removal of encroachments and improved sanitation facilities. But its proposals have not been implemented yet.

A recent analysis by IISc on lakes showed that of 265 water bodies that existed in greater Bangalore in 1972, only 110 remained in 2007. The analysis also revealed a decline of 61% in the number of water bodies with a 63% decrease in vegetation cover in Greater Bangalore. Very few of them are in good condition and most of them are victims of encroachers who dump waste into water. Appropriate policy decisions, interventions and holistic approaches are required to restore them from degradation and assure them a sustainable environment.

LDA has taken up study of 77 lakes in the city to assess the water quality. According to a highly placed official, the water quality is bad and the main reason is lack of coordination among various departments. He pointed that 85% of the lakes are highly polluted and contain heavy metals such as mercury, lead, chromium and arsenic due to industries which release chemicals, insecticides and pesticides as effluents. Apart from this, a large quantity of nitrates and phosphates has been found in lakes close to urban areas due to domestic waste being discharged into it.

Since the treatment plants are set up at tertiary levels, they merely clean up organic matter and dirt, while chemical components remain untouched. The official said it is difficult to improve the water quality as the concept of 'pollute and pay', proposed by the department of environment, is yet to be implemented in industries for lack of government clearance.

Under this concept, industries will have to invest funds based on their size. While they will be given incentives for maintaining the eco-system, they will also be heavily fined for letting out pollutants into the atmosphere and for not recycling and reusing energy. At present, no board meeting has been held to finalise the steps for the implementation of the concept after which it needs approval from the assembly, environment and ecology secretary Kanwar Pal said.

"To improve the water quality, the entire landscaping and underground drainage system need



POISONED WATER: In Bellandur lake, the sewerage dumped is 500mld, while the treatment plant's capacity is only 240mld



CLEAN DRIVE: There is an urgent need to regularly clean up the lakes most of which are victims of encroachers who mindlessly dump waste into the water

to be changed. It will take time as it is being done in a phased manner since the drains were laid during the British era. Most of the storm water drains are clogged and there is also encroachments which need to be cleared," environment, forest and ecology principal secretary, Meera Saxena, said.

The water is contaminated due to the presence of landfill sites and the poor leachate system, due to which water percolates underground like in the case of Mavallipura village. In other parts of the city, bio-medical waste, toxic and organic waste are contaminating water and soil quality.

BWSSB board member and chief engineer of waste water management SM Basavaraj said sewerage treatment plants have been set up in 14 storm water drains and in Madiwala lake. In four cases, the treatment plants are for non-potable water use as in the case of Cubbon Park, Lalbagh, Kempambudhi lake and Madiwala lake. Talks with the BBMP and BDA are on to set them up in 31 more lakes, detailed project reports for which are being prepared.

A deadline of 2012 has been set to restore the water quality in Bangalore. To achieve this, treatment plants will be set up and underground

draining pipelines will be changed and re-routed so that their direct outlet is not into storm water drains and lakes. Treated water will be allowed to enter them. An agency has also been hired to study the borewell status and draw measures to restore water quality.

KSPCB chairman AS Sadashivaiah said that the board, as an agency, is keeping a check on the water quality and is informing agencies to draw measures to maintain the quality.

"A comprehensive study of total water scenario in the city is essential and it is also important to consolidate all information compiled by various agencies to view the gravity of the situation," he said.

Even as the city's water bodies get more and more polluted, we acquire numerous diseases from micro-organisms found in water. The majority of human diseases associated with microbially contaminated water are, however infectious in nature and the associated pathogens include numerous bacteria, viruses and protozoa. These organisms are introduced into the aquatic environment through fecal contamination from infected persons or animals that is discharged into sewers or unprotected waterways or water bodies.

k_bosky@dnaindia.net

SOLUTIONS

- 1 IMPLEMENT THE** 'pollute and pay' concept proposed by the department of environment. Under this, industries will be heavily fined for letting out pollutants into the environment and for not recycling and reusing energy.
- 2 FORM 33%** buffer zone, remove all encroachments near water bodies, and improve sanitation facilities. Government agencies should keep a check on water quality.
- 3 Treat water** before letting it into drains and lakes. Set up more sewerage treatment plants in storm water drains and lakes. Change underground drainage system and run it at a distance from water pipelines.

DISSOLVED OXYGEN LEVELS LOW IN DRINKING WATER

Research carried out by Dr Nandini, professor and principal investigator, and Durgesh R, research scholar, from the department of environmental science, Bangalore University, on drinking water samples in and around the central part of Bangalore city showed remarkable variation in the quality of water.

A comparative relationship between the physical quality index and the microbial assessment of the bio-film forming organism in drinking water showed the magnitude of bacterial contamination in the drinking water supply lines. The dissolved oxygen levels in the Central Zone are alarmingly low and are within 0.25 mg/L of reaching the minimum floor limit.

The chemical oxygen demand, and biochemical oxygen demand in the South-Central zones of the city are above the primary water quality criteria. The bacterial results revealed contamination by micro-organisms such as pseudomonas aeruginosa, thiobacillus thioparus, sphaerotilus natans, leptothrix discophora and desulfovibrio desulphuricans.

The water pipelines are choked and corroded and the supply gets contaminated as the sewage lines often run along or cross the water pipeline system in these areas.



To improve the water quality, the entire landscaping and underground drainage system need to be changed. It will take time as it is being done in a phased manner since the drains were laid during the British era. Most of the storm water drains are clogged and there is also encroachments which need to be cleared."

—Meera Saxena, Environment, forest and ecology principal secretary