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Growing garbage menace ups nitrate content in lakes

Subhash Chandra N S, Bangalore, June 25, 2014, DHNS

IISc study at 19 locations near water bodies reveals high level of contamination

The City's mounting garbage has resulted in largescale pollution of large and prominent water bodies such as Varthur, Madivala, and Yelemallappachetty lakes (K R Puram). The level of contamination is alarming as the presence of nitrate has been found in these lakes, which are in the City's IT corridor.

The shocking information has emerged from a recent study by the Indian Institute of Science (IISc) on the illegal dumping sites situated near water bodies. Energy and Wetland Research Group (EWRG), Centre for Ecological Sciences, (CES) of the IISc, has found that waste dumping has led to severe pollution of the water bodies as well as the groundwater, which if unchecked might lead to serious health hazards. Dr T V Ramachandra, senior scientist, headed the team.

The study titled, 'Groundwater quality impairment due to mismanagement of biodegradable waste', conducted between 2011 and 2013, used data from government agencies, GIS and field survey to find open dump sites and drainage blockages due to clogging of waste, which revealed high level of nitrate in some lakes.

"Samples drawn from Garudanakere, Herohalli, Madivala, Varthur, Veerasandra and Yelemallappachetty lakes have high nitrate content which ranges between 5mg and 7mg/1. There are nine illegal dump sites around these lakes," the study says.

It identified 62 dump sites near major water bodies in the City, which were spatially distributed in all the four zones- 21 in northeast, 28 in southeast, 11 in southwest and two in northwest.
These sites were classified based on their composition of waste such as plastic, organic, construction debris, indeterminate (mixed up fresh waste making segregation difficult) and so on, based on the percentage of the waste volume at the dump sites.

In 47 per cent of the locations, construction debris was predominant in the waste, as construction activities were going on in nearby areas.

Organic waste, plastic waste and rejects from recycling units were located at 26 per cent, 24 per cent and three per cent, respectively, of open dump sites.

Waste is also dumped into the drainage network. About 95 locations of drainage channels were observed during the monsoon.

“The presence of solid waste in drainage channel is very common. Dumping of solid waste in the lakebed and in catchment areas has contributed to the contamination of water bodies. Practices of direct discharge of sewage and waste water into water bodies are major reasons for the contamination of surface water in Bangalore,” the study points out.

Waste management

Nitrate level in groundwater and surface water was assessed to check the impact of waste management in urban area.

At 19 locations near unauthorised dump sites, water bodies show a higher level of nitrate in the groundwater.

“We had drawn samples from borewells near these water bodies which have been converted into dump sites,” said Dr Ramachandra.

“Reasons could be related to continously increasing direct inflow of sewage, waste water and leachate into water bodies. As there is no other possible reason for the increasing level of nitrate in groundwater, mismanagement of water has a significant impact on groundwater quality parameters. There is a need for immediate intervention for waste treatment to avoid further contamination of groundwater,” the study says.

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