
Bengaluru lakes are frothing and a household item may be the cause

Sushmita Sengupta



@lakewarriors

| Thursday 17 August 2017

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BENGALURU LAKES

Scientists say excessive phosphorus from detergent, which enters the lakes along with sewage, is creating the foam



📷 Froth from the lake covers the road in Bengaluru
(Credit: Rohit Saxena/YouTube)



A day after **flash floods and heavy rain**, parts of Bengaluru have now been covered in froth from its dirty lakes. Photos and videos posted by locals as well as news media show the extent of the spillage in Bellandur and Vathur lakes, which has reached roads and restricted vehicles.

The Chief Minister of Karnataka Siddaramaiah was quoted by news agency ANI as saying that the government is taking all the necessary action to solve the problem.

While its extent is unprecedented, **froth and fires** are a common site in Bengaluru's lakes after years of pollution from sewage and industrial waste. These incidents have been reported since **2015**. In April 2017, the National Green Tribunal ordered the Karnataka State Pollution Control Board (KSPCB) to shut down all industries around the Bellandur lake, but their current status is unknown.

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Detergent: cleaner or polluter?

The chemical analysis of froth samples from Varthur lake by scientists at Indian Institute of Science (IISc) reveals the presence of compounds containing nutrients (Nitrogen, Phosphorus and Carbon) and cations (Sodium, Potassium, Calcium and Magnesium), which come from detergents, oil and grease (See table 1). Algal bloom or foaming is caused by high concentration of chemicals Nitrogen and Phosphorus, which are present in human and other household waste, detergents and industrial effluents, says T V Ramachandra, professor at IISc. Sewage is often dumped untreated in the lakes, resulting in pollution and resultant frothing.

An official in the KSPCB, who does not want to be named, says, that around 80 lakh grams of soap enters the lake annually, due to the low capacity of sewage treatment plants. The phosphorous in the sewage settles down in the sediments. High intensity winds in the pre-monsoon phase cause the water to churn and release phosphorous from the sediments. During heavy rains, fresh water enters the lakes with force and stirs it, causing froth to build.

Ramachandra explains that the frothing is thus due to presence of non-biodegradable, detergent-like substances coming from the municipal wastes and industrial effluents. The research says that with the increasing urbanisation, the popularity of synthetic detergents has increased which, in the long run, is adding phosphate to the water bodies. Nationwide, the outflow of phosphorus is estimated to be 146,000 tonnes

every year, as per the study.

The KSPCB says that lake water is loaded with domestic sewage. The quality is not even suitable for bathing. The Biological Oxygen Demand (BOD) of the lake is much higher than the standard value set by Central Pollution Control Board for outdoor bathing at 3 milligram/litre (mg/l). According to a KSPCB report, Bellandur lake had high BOD during January-February consecutively between January 2013 and January 2015. The number during these years did not fall below 7mg/l. Traces of total coliform bacteria, which is used to indicate the sanitary quality of water, were also found.

Comparison of lake water and froth		
Parameters	Sample of Varthur Lake	Sample of Foam
Water temperature (0C)	27.1	27.2
TDS (mg/l)	448	7000
EC (μ S)	749	17000
pH	7.46	6.98
DO (mg/l)	2.6	-
BOD (mg/l)	24.39	650.41
COD (mg/l)	40	1140
Alkalinity (mg/l)	336	12000
Chloride (mg/l)	117.86	3195
Total Hardness (mg/l)	206	13000
Ca Hardness (mg/l)	57.72	3607.2
Mg Hardness (mg/l)	36.03	2282.45
Phosphate (mg/l)	1.263	74.59
Nitrate (mg/l)	0.541	129.72

Sodium	169.5	770
Potassium	35	230

Source: Indian Institute of Science, Bangalore

What is the way out?

Leo Saldanah, coordinator of Environment Support Group (ESG), a Bengaluru non-profit, says that frothing from polluted lakes brings to the fore the lack of planning for the sewage in the city.

Scientists suggest a decentralised waste water systems, instead of the centralised systems used in urban areas, for better management.

Ramachandra points to the need to increase the capacity of the sewage treatment plants, but there is a need for immediate intervention of alternative type of detergents. Use of sodium tripolyphosphate (which leads to excess of phosphate) in detergents must be reduced and non-phosphate alternatives must be promoted instead. One such substitutes can be sodium aluminum silicate.

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No industry would be allowed to operate in the lake area unless effluent emissions are under permissible limits. Industries found violating the order will be sealed

again; waste burning, untreated sewage to be blamed

Locals have time and again approached the civic authority to stop the discharge of chemicals and other toxic substances from factories and households into Bellandur

Citizens submit action plan to save Bengaluru's Bellandur Lake

If local authorities give considerable attention to the proposed action plan, the situation of Bellandur Lake could change for the better

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