



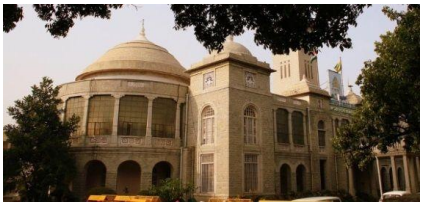
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RESTORE INTER-CONNECTIVITY BETWEEN LAKES "STOP SEWAGE FLOW IN BELLANDUR LAKE "BWSSB" IS DIRECTLY RESPONSIBLE "METHANE HAD FANNED THE BLAZE"



By: M.S.Yatnatti: Editor and Video Journalist Bengaluru: Urgent need to restore the interconnectivity among lakes, that Bengaluru's lakes are in dire straits is well known. Now, researchers from the Indian Institute of Science (IISc) have only confirmed this further. According to a recent analysis done by them, Bengaluru has lost 45-50% of interconnectivity among lakes, owing to encroachments and unplanned development. This has not only resulted in decaying of lakes due to sewage inflow, but has also led to frequent flooding of areas in neighbourhoods. Bellandur Lake, the Bengaluru city's most polluted water body that spews toxic froth and occasionally bursts into flames, is guarded by several marshals who have been deployed by BBMP to check garbage dumping and encroachments. However, the 16-member team reportedly does not have the power to penalize the offenders. All they can do is just warn miscreants and 'advise' them not to repeat it. Reportedly they may have been successful in discouraging a few culprits, but warnings or advice from a seemingly toothless team will not keep offenders at bay. The BBMP must do a reality check to assess how far its measures have been successful on the ground and take adequate corrective steps. The fire at Bellandur Lake is a human-made disaster. Reportedly National Green Tribunal (NGT) recently had asked the Karnataka government about the cause of frequent fires at Bellandur Lake, including the 30-hour-long blaze a couple of weeks ago, government agencies submitted that it was due to burning grass — probably a fire set off by miscreants. However, Indian Institute of Science (IISc), the country's premier science institution has, in one of its reports filed in the wake of a similar fire in February 2017, identified increasing level of methane in the highly polluted lake as the cause of the fire.

A senior scientist with IISc reportedly had said that their preliminary investigation to find out the cause of the January 19 fire in the water body also indicated that the presence of methane had fanned the blaze and sustained it for more than 30 hours. It is time BDA BBMP act united, and shut down lake for sewage to enter and not industries, Bellandur Lake needs a compound wall I am suggesting a way to solve Bellandur and Varthur Lake problems which has become health hazardous. a pilot project to clean it Either you close it or convert it into a rain water harvesting tank. Let Government BDA BWSSB BBMP construct concrete wall around Bellandur Lake and convert that into a water tank and allow only rain water to be stored as rain water harvesting tank and stop any sewage and industrial discharge into lake. By this it could store clean water in Bellandur and Varthur. If this is successful then can be repeated to other lakes. The Swachh Bharat Abhiyan, one of the Narendra Modi's flagship schemes, may be missing out on one of the key ingredients of clean cities. Many of India's big cities are struggling to treat their sewage as well. According to figures from the 2016 compendium of environment statistics, Delhi's sewage treatment capacity was only 60% of its total sewage generation. The figure is less than half for many big cities in eastern and central India. Just construction of lakhs of toilets are not sufficient. It is equally important sewage so collected cannot be let in open drains and lakes but in Bengaluru BWSSB is not able to treat all the sewage so generated and it is helplessly allowing sewage to enter in open drains and lakes and it is causing oxic foam and other harmful effects to citizens. Vision statement: Mission statement: of BWSSB both are not read by officers of BWSSB.

The Bengaluru Water Supply and Sewerage Board (BWSSB) is committed to providing drinking water of unquestionable quality in sufficient quantity and also to treat the generated sewage to the required quality parameters. As the leader in providing water and sanitation services, BWSSB is recognized as an effective instrument of change through adopting state-of-the-art technologies for improving the quality of its services to the general public. BWSSB's vision rests on its unwavering commitment to providing value added quality services using innovative and cost effective solutions to achieve customer satisfaction, by remaining ever sensitive to their needs by anticipating their requirements, keeping public interface always open and staying in the forefront in all endeavors. Sewage is not treated and it is let off in lakes endangering life of people. Of the total water supplied about 80 percent come out as sewage. Reportedly 1000 MLD of sewage is generated everyday in the city. Of the 1000 MLD, BWSSB claims to treat 843 MLD. But going by sources even this claim is not true. With power issues and lack of maintenance dogging its STPs, the BWSSB barely manages to treat 500 MLD, they say. Ask the BWSSB about its failure to treat all of the city's sewage and a senior officer admits that with its area of operation increasing over the years it is not able to fully do its job. "The water board was only tasked with taking care of water supply and the sewage in the core areas spread over 245 sq. kms when first set up. But with the addition of areas under the city and town municipal councils, its jurisdiction increased by 330 sq.kms. Also with the addition of 110 villages it is now required to take care of another 225 sq. kms, which has made its job almost unmanageable," he contends. "In the recent past we have been laying more stress on building new STPs. Work is on in full swing to build them at Bellandur, Kengeri, Yellampachetti, Doddabele, Horamavu and Kadugodi and they are expected to be operational by the year end, solving most of the crisis in the city caused by untreated sewage water," he, however, assures. Recalling that developed countries too have passed through this phase of polluted water bodies, water expert S. Vishwanath, notes that the River Thames in London was also once smelly with sewage. He, however, believes the problem can be overcome if people are willing to pay for treating their sewage. "The cost of treating sewage is huge. You need Rs18 to 20 to treat a kilo litre of water (1000 liters) with basic technology. We can overcome the pollution caused by sewage in a matter of two years if people support the cause and are willing to pay for the service," he says. But to me it is Government and BWSSB duty and they cannot pass the buck after collecting huge taxes from citizens and on every item citizens cannot be forced to pay.

Reportedly Videos showed cars disappear into plumes of foam on a road adjacent to the Bellandur Lake, where sewage and industrial discharge is believed to have created a concoction of chemicals that often creates froth. Lakes frothing, catching fire and risking the health of entire neighborhoods: Bengaluru has seen all these and more in the past decade as break-neck construction and poor urban planning choked water bodies, filled them up with sewage and pollutants. Here are few facts that citizens must know about the city's environment crisis. The foam is toxic and few reports say it is carcinogenic. It causes breathing difficulties, irritation on the skin, besides spreading an unbearable stench. Whenever it rains, the lake overflows, spilling the froth onto roads, blocking traffic. Reportedly a study at the Indian Institute of Science in Bengaluru, found that around 90% of the lakes in Bengaluru were affected because of the "sustained inflow of untreated sewage and industrial effluents". In the infamous Bellandur Lake, for example, receives 500 million litres of untreated sewage. According to a report by the Karnataka State Pollution Control Board, of the 67 lakes surveyed in Bengaluru, none had water that was fit for drinking. Local water conservation expert Sri S Vishwanath said that some industrial effluents are harmful, "but it is domestic waste that we need to worry about because it forms 90 to 95 per cent of the waste that is dumped in lakes". The indiscriminate discharge of household waste and industrial effluents into lakes is what causes the toxicity, leading to the water body foaming.

Another thing to blame is detergent: Experts say the ubiquity of washing machines in urban India and indiscriminate use of detergent by households have come together to turn Bellandur Lake into a foamy disaster. Incidentally, around 40% of 1,800 households surveyed in eastern Bengaluru (where the water body is located) were found to be using at least five kg of detergent in a month. Bengaluru's lakes — about 600 large and small ones — have been the casualty of the city's rapid expansion since 2001. According to Census data, the city's population shot up from about 6.5 million to around 9.6 million between 2001 and 2011, an increase of around 50%. This made it India's fastest growing city in that period. A research paper titled 'Impact of heavy metal contamination of Bellandur Lake on soil and cultivated vegetation' says: "The study reveals that sewage is the main source of pollution of this water body and irrigation with sewage-contaminated water containing variable amounts of heavy metals leads to increase in concentration of metals in the soil and vegetation." According to another paper, Rejuvenation of Bellandur lake, says: "There have been adverse environmental and public health consequences. The local community complained about the water borne diseases, contaminated bore well water (due to poor environmental conditions), etc.

The committee is convinced of the problems faced by the local biological entities (humans, livestock, etc.) of serious water and soil contamination and consequent impacts in the food chain. Apartment complexes that have come up in the past decade in Bengaluru are lined up across the bund of the lake. Between 2001 and 2011, the city's population increased from 6.5 million to 9.6 million, the highest rate of growth of any city in India. According to water conservation expert Sri S Vishwanath, no place could deal with such a surge in population. In 2015, foam from the lake spilled over on to roads and other spaces surrounding the lake. At the time, authorities insisted that the foam was from the detergents households discharged into the river. Last year in April, the froth on the lake had caused a traffic jam. More recently, on May 7, the city's Bellandur lake caught fire. The resulting thick smog surrounded the heavily-polluted lake, making it difficult for the passers-by to breathe. The National Green Tribunal has repeatedly criticised Bengaluru's civic authorities for letting the city's water bodies become, in effect, toxic waste dumps. The central body could find similarly mistreated lakes in countless other cities in India. Multiple sorts of wetlands are being lost due to urbanization, changes in land use and pollution. What lakes have survived are shrinking. Rapid urbanization in Delhi NCR, for instance, is taking its toll. The expansion of impermeable surfaces like concrete roads and pavements is preventing the recharge of groundwater aquifers and blocking the flow from water channels to lakes.

Bangalore Water Supply and Sewerage Board is an autonomous body formed by the State legislature under Bangalore Water supply and Sewerage Board Act on 10-09-1964 for Water Supply & Sewerage disposal. It is one of the first Water supply & Sanitation Utilities in India with jurisdiction of entire Bruhat Bengaluru Mahanagara Palike Area of 800 Sqkm, (Bengaluru Core area of 245 Sqkm, 8 Urban Local Bodies of 330 Sqkm (7 City Municipal Corporation and 1 Town Municipal Corporation and 110 Villages of 225 Sq kms.) It has the following mandates: adequate water supply to meet demand; creation of sewerage network & safe disposal of sewage; Preparation, implementation of plans & schemes for augmenting water supply & safe disposal of sewage; Levy and collection of water charges on 'no loss no profit basis' for sustainability of the system. Since its inception in the year 1964, BWSSB has executed several water supply and sewerage schemes for the city, including the prestigious Cauvery Water Supply Scheme (CWSS) Stages - I, II, III & Stage IV Phase - I, Phase - II and sewerage system improvement projects concentrating on sewerage collection, conveyance and treatment works. The existing sewerage system covers an area of 265 km² of core area of the city, in which three major Sewerage Treatment Plants (STP) are constructed at Vrishabhavathi, K&C and Hebbal Valleys (major and minor). The sewerage system for newly added areas mainly the erstwhile CMC's is nearing completion.

Overview of Water supply and sewerage System :Bangalore, the capital city of Karnataka is the third largest city and the fifth largest metropolitan area in India and is one of the fastest growing metropolitan cities. It is a centre for education, IT & BT industries, sophisticated high tech health care and many MNC industries which are attracting people to the city. As per Census 2011, the population of Bangalore city was about 8.5 million. The Bangalore Water Supply and Sewerage Board (BWSSB) is responsible for providing water supply to BBMP area of 800 sq. km. Government of Karnataka allocated 19 TMC of water from Cauvery River for the water supply requirements of Bangalore City. In the year 2012, with the commissioning of the CWSS Stage IV, Phase II, the allocated water from Cauvery River has been exhausted. At present BWSSB is supplying treated Cauvery Water to Bangalore City under the Cauvery Water Supply Scheme (CWSS) Stage I, II, III & Stage IV Phase I & II with total installed capacity of 1310 MLD. This quantity of water provided to the core areas of BBMP including the erstwhile 7 CMC's and 1 TMC area covering total area of 575 sq.km but excluding 110 village areas of BBMP covering 225 sq.km. In order to provide water supply to the newly added 110 villages which are part of BBMP, BWSSB is finding it difficult to meet the water requirements even after implementation of CWSS Stage IV, Phase II scheme. Subsequently, the Urban Development Department, Govt. of Karnataka (GoK) allocated an additional 10 TMC (775 MLD) of Cauvery Water for Bangalore city. It is now necessary to formulate the CWSS Stage V scheme for Bangalore City and Detailed Project Report (DPR) has been prepared for getting the financial assistance from funding agencies, such as JICA (Japan International Co-operation Agency). Considering the technical aspects and water demand it is proposed to take up the Stage V Scheme in two Phases i.e., Phase I of 500 MLD (6.45 TMC) capacity and Phase II of 275 MLD (3.55 TMC) capacity.

EXISTING WATER SUPPLY SYSTEM SCENARIO: Till the year 1896, unfiltered water was supplied to Bangalore city in the Kalyani system from a number of tanks such as Dharmambudhi, Sampangi, Ulsoor, Sankey etc., supplemented by local wells and stepped ponds. The supply was inadequate from these tanks, hence, Arkavathi river was identified as the first large reliable source in the year 1884 and filtered water



supply was started in the year 1896. Due to the continuous expansion of the city and the rapid growth of population, it became necessary to find and develop new sources. Cauvery River was identified for water supply and allocation of water from Cauvery river was done by Government of Karnataka (GoK). Since 1974, the Cauvery source has been developed in stages for water supply. This chapter discusses the schemes of river Arkavathi and River Cauvery which are the present sources of water.

To supply filtered water to Bangalore City, Arkavathi source was identified in the year 1884. A reservoir was created at Hessarghatta about 18 kms to the North West of the city. An open masonry duct, 7 km long conveyed 29.5 Mld of raw water from source to Tarabanahalli and Soladevanahalli. From Tarabanahalli 7 Mld of water is supplied to Military. From Soladevanahalli 22.5 Mld water was pumped to city at a head of 125 m through, two 375 mm CI rising mains to Combined Jewel Filters (CJF), Malleshwaram where the water was treated. Treated water was first supplied after completing treatment plants at CJF on 7th August 1896. Modification took place at Hessarghatta source by replacing masonry duct by 1050 mm diameter RCC Hume Pipe with a carrying capacity of about 36 Mld. One more rising main of 375 mm diameter was laid from Soladevanahalli. These three pipelines can carry 22.5 Mld water under normal conditions, out of which 13.5 Mld was supplied to the city and the balance water was supplied to enroute industries. Due to failure of monsoon, there is scarcity of water at source, only about 4 mld of water available was supplied to Military and Industries enroute in Peenya layout.

This water is supplied as raw water because the treatment plant at CJF is not functioning and the receiving units such as HMT, Peenya layout and Defence establishments are having their own treatment facilities to treat this raw water. However, no water is being drawn at present from this source. Thippagondanahalli (T.G.Halli): With the growth of the city the supply fell short of demand hence a new reservoir 'Chamaraja Sagar' near Thippagondanahalli (TG halli) was constructed in the year 1933 across the river Arkavathi, downstream of Hessarghatta reservoir about 26 km to the west of Bangalore. Water Treatment Plant is situated at the foot of the dam at T G halli. The first phase of the scheme was completed during March 1933 to augment the then supply by about 28 Mld. Subsequently, the abstraction was increased to 149 Mld by providing additional infrastructure such as increasing the capacity of the dam, providing additional treatment and pumping facility. This improvement is done by providing two stage pumping, the pumping head being 158 m at T G Halli and 168 m at Tavarekere which is the intermediate pumping station. Transmission system consists of 3 pumping mains of 600, 675 and 900 mm diameter CI pipes from T.G.Halli to CJF. Due to failure of monsoons and constraints in the existing pumping system only about 117 Mld is available most of the times and is supplied to West of Chord Road, Beggars Colony, Kethamaranahalli (KMH) and CJF after implementation of Cauvery stage III project. Due to continuous failure of monsoon, the reservoir last got filled in the year 1988. Presently there is no flow available. Because of these reasons Arkavathi zone reservoirs are also being fed with Cauvery water.

CAUVERY WATER SUPPLY SCHEME: A total supply of about 185 mld from the Arkavathi scheme was grossly inadequate to meet the demand of about 16 lakh population in the late sixties. Due to the continuous expansion of the city and the rapid growth of population it was necessary to identify new water supply sources. Cauvery River, which is about 86 km South of the city, is perennial and Government of Karnataka (GoK) allocated drinking water to BWSSB. Cauvery source is being developed in stages since 1974. Cauvery water supply scheme (CWSS) stage-I was commissioned in the year 1974 to augment the supply by 135 Mld. CWSS Stage-II followed and was commissioned in 1982 to further augment the supply by 135 Mld. CWSS Stage-III was commissioned in 1994-95, this stage augmented supplies by 270 mld. Cauvery water supply scheme (CWSS) stage-IV Phase I was commissioned in 2002 to augment supply by 270 Mld. CWSS Stage- IV Phase II followed and was commissioned in 2012 to further augment supply by 500 Mld. The salient features of the complete water supply system is shown in the tables below:

The BWSSB and BBMP have systems in place to address grievances: To make it easier for citizens to lodge complaints and for more efficient and transparent redressal, the Bruhat Bangalore Mahanagara Palike (BBMP) has launched its new website Spandana (www.spandana.kar.nic.in). All complaints can be filed, from tree fall, health, revenue, to civic infrastructure works. The citizens have two options – they can call the control room's number or lodge complaints online. Officials in the BBMP say, "As soon as the complaint is lodged, it gets registered in the main bank. The citizen will also get a SMS informing him about the status of the complaint. We have also provided all the officers with wireless sets. The information about the complaint area and the complaint details will be forwarded to the officer concerned." The time taken will differ according to the nature of the complaint. "While the minimum response time is 24 hours, the maximum can extend up to even six months. Complaints relation to removal of tree branches, street lighting, garbage collection etc will be addressed within 24 hours. Infrastructure work like road asphaltting will take longer, maybe three to four months, as it requires administrative approval," the official explains. The control room number is 22660000. BWSSB has 24-hour hotline: The Bangalore Water Supply and Sewerage Board (BWSSB) will redress any water or sewerage complaints within a day. There are service stations in every locality where any water, sanitation, or even billing complaints can be lodged. An official explains, "You can either call up or send a written complaint to the assistant executive engineer (AEE) concerned. Your complaint will be recorded in the register and attended to within 24 hours." The water inspector or the sanitation inspector will be sent to inspect the area and take required measures. In case of a blocked sanitary pipe, the manhole will first be cleaned manually using bamboo sticks. If the pipe is still blocked, jetting or pressure machines will be used to clear it. Despite this, if the pipe gets frequently choked or overflows, then the sanitation inspector will analyse the problem and, if need be, replace the pipes with one having a higher diameter. To register a complaint by phone, the 24-hour hotline number is 155313. You can also address a mail to the chairman at chairman@bwssb.org and to the PRO at pro@bwssb.org for the redressal of any complaints.

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