

In search of easy to implement solutions

Not just humans, but drains need oxygen too for there to be life on its periphery. Residents living in the vicinity of the Sai Baba drain in Sahibabad area of Ghaziabad were pleasantly surprised to see the rare sprouting of flowers and hovering of dogs and birds on the bed of the drain. An accelerated bioremediation plan implemented by a private company at the behest of an MCD Corporator and social worker and members of the Resident Welfare Association (RWA) is being evaluated as a possible solution to clean not just this drain but other drains and water bodies in Ghaziabad.

Bioremediation is a water pollution control technique involving use of nutrients to remove/neutralise pollutants from a contaminated water body. The so-called “Nualgi” technique can mitigate impact of vast amounts of untreated sewage discharged into a river or open drain.

Residents from Sahibabad’s Brij Vihar approached Mr Vinod Choudhary, Corporator, East Delhi, Municipal Corporation of Delhi to visit Sai Baba Drain, which starts from Apsara border and flows through residential colonies of Rampuri, Alaknanda and Brij Vihar. This public combined sewer with a flow of 25-35 million litres per day (MLD) contains domestic waste from proximate colonies and industrial waste from industrial clusters upstream. It is also a bypass drain for the J Point Sewage Treatment Plant (STP).

Houses along the stretch facing the drain raised slopes leading to their homes, increasing height of their gates and putting heavy curtains as a veneer. Alas! These were feeble attempts to keep the smell, mosquitoes and flies at bay. Further, noxious fumes penetrated these barriers and destroyed not



just their health but also the copper tubing and wiring of domestic electrical appliances. Complaints of gastro and vector borne diseases increased, primarily due to bad water quality.

Mr Choudhary, who by no means was unfamiliar with waste management systems, scouted for a viable solution to alleviate problems emanating from the Sai Baba drain. His recce led him to Gurgaon based JS Water Energy Life. After discussion and site visits, an accelerated bioremediation plan was implemented with 6-8 dosings of Nualgi and bio augmentation material in the 1km stretch that flowed through the colony over a four-week period. 'Nualgi' is a research product that can grow diatom algae on any water surface. The inorganic product (30grams of nutrients for 2-4 million litres of water) drives organic processes of water and reduces biochemical oxygen demand (BOD) and chemical oxygen demand or COD (5% or

more in 3 months of dosing). A pilot project was undertaken at a cost of Rs 60,000 funded from Mr Choudhary's personal funds. Necessary approvals from the Municipal Corporation were obtained and the piloting was executed in October 2015.

Impact of dosing on water quality

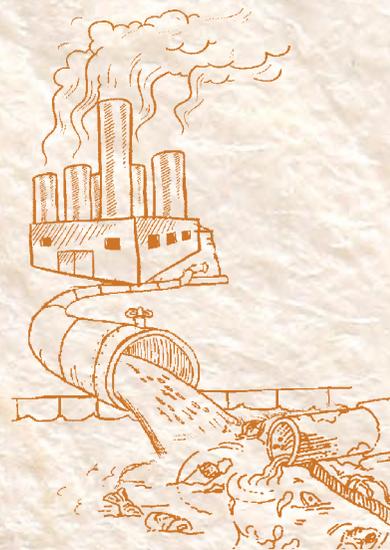
Within 20 minutes of the dosing, bubbles of oxygen were seen rising to the surface and creating ripples in the water; dissolved oxygen concentration in the drain was increased. This was not just localised, but effects were seen downstream with sludge from the bottom of the flowing water body breaking into smaller particles, rising up to the surface and flowing out with the water downstream. The colour of the water changed from a dark ominous grey to a lighter gradient and the waters' flow intensified, getting lighter in weight, further helping aeration processes.

“While results of our lobbying with local municipal authorities and Pollution Control Board will produce results in due course, our combined efforts led us to a technology that has helped reduce the drain's pollution”

Samar Pal Singh, President, Resident Welfare Association, Brij Vihar

“Before we implement this low cost, simple technology, huge mounds of polythene, construction material and garbage must be cleared from water bodies. Unless residents and local authorities ensure that no solid waste will enter water bodies, interventions like ours will have limited impact.”

*Sunil Nanda, Managing Director,
JS Water Energy Life Co. Pvt. Ltd*



The biggest relief was suppression of stink. Other benefits noted by water experts was reduction in thick layers of algae that were earlier present over the water surface. Aeration and the enhanced impact of Nano bubbles helped release vial oxygen into the water body at all levels, including at sediment interface. The water level of the drain dropped by nearly 10 inches with sludge disintegrating in less than a month, reducing risk of flooding during monsoon. Although the technique could not achieve the effect of heavy metal reduction, it recorded significant reduction in organic pollution loads pronouncing the initiative a success.

Taking it to other water bodies

Seeing the success of Nualgi on the 1km stretch of the Sai Baba drain, the Ghaziabad Nagar Nigam is likely to replicate this with other drains flowing down to the Hindon river. According to JS Water Energy Life the National Mission for Clean Ganga is also considering bioremediation for cleaning up parts of the river.

Added advantage: Slashing massive cost and inconvenience of dredging

The so-called Nualgi bioremediation technique helped remove sludge which otherwise would have been done conventionally using expensive hydraulic and mechanical means that are labour intensive and uneven. Average cost of mechanical removal is Rs 660/cubic yard. Dousing Nualgi with bio augmentation makes bio dredging possible while waiving costs off.

REFLECTIONS & WAY FORWARD

The efficacy of this technique (Nualgi) can be endorsed on the basis of authentic scientific evidence and published peer reviewed references. A potential replication of the Sahibabad example in other drains in Ghaziabad (or elsewhere) would therefore require a scientific monitoring and evaluation component. It is recommended to involve a reputed technical institution as an integral part of proposed pilot projects.

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