Role of Micro-bacteria in Cleaning of the Organic Pollutants from Yamuna River

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Abstract

Despite the fact that Delhi is one of the principal Indian urban communities to have paid consideration on city arranging with the main Master Development Plan of 1962, the base for open utilities is ended up being lacking. Populace of Delhi (according to the 2001 statistics) is 13.9 million and is relied upon to achieve 22 million by the year 2021. The city, right now, requires 3,324 million liters of water a day (mld) while what it gets stands more like 2,034 mld (2621 mid less 20.5% of dissemination misfortunes) [source: DJB]. Normal water utilization in Delhi is assessed at being 240 liters for each capita every day (lpcd), the most astounding in the nation.

As a result there is expansive scale extraction of groundwater which has influenced both the quality what's more, amount of groundwater. Aside from groundwater, Delhi gets its water from the Ganga Canal, the Western Yamuna Canal, the Bhakra Canal and the Yamuna. 86% of Delhi's aggregate water supply originates from Yamuna River. This equivalents 4.6% of this asset got through interstate assentions. Yamuna streams in a southerly bearing inthe eastern part of the Union Territory of Delhi. Delhi's water and wastewater administration is controlled by the Delhi Jal Board (DJB). The extreme water contamination issue of Delhi is in this manner basically the amazingly contaminated state of the River Yamuna in Delhi. In this section we take a gander at different measurements of the water contamination issue of Yamuna River in Delhi and in Chapter 5 we will talks about the different measures being embraced for the tidying up of Yamuna River in Delhi.

Introduction

The research work is being processed to find out the data related to the role of Micro-

bacteria in cleaning of organic pollutants from Yamuna. River Yamuna is one of the

most polluted rivers of the India. It originates from Yamunotri glaciers in the lower Himalayas at an elevation of approximately 6387 meters. The barrages formed on the river are playing a major role in escalating the river pollution. River can be divided into five segments on the bases of hydrological and ecological conditions. Water quality of only one segment (Himalayan segment) meets the river water quality standards. Normally no water is allowed to flow downstream of the Himalayan segment (Tejewala barrage) especially in the summer and winter seasons to fulfill the demand of water of the surrounding area. Whatever water flows in the downstream of the Tajewala barrage is the untreated or partially treated domestic and Industrial wastewater contributed through various drains. The discharge of untreated domestic and industrial effluents have severely affected the quality of Yamuna River and now it falls under the category E, which makes it fit only for recreation and industrial cooling, completely ruling out the possibility for underwater life and domestic supply. Almost every year mass death of fishes is reported. Pollution levels in the Yamuna River have risen. Biochemical oxygen demand (BOD) load has increased by 2.5 times between 1980 and 2005: From 117 tonnes per day (TDP) in 1980 to 276 TDP in 2005. The Yamuna has been reduced to a small stream, draining industrial effluents, sewage, dirt and other toxic substances. There is an urgent need to take stringent measures to alleviate these pollution loads and save an ailing river

Objective

The main objective of this work is to collect the data to understand the role of micro-bacteria in cleaning organic pollutants from Yamuna. As the impurities of Yamuna is well known to us and it's process of cleaning is also popular in many area, therefore the basics of purification and mainly the importance of micro-bacteria are to be known. For many government and non-government organizations this work is behaving like a leaning chapter for the development and purification of Yamuna in the near future.

Review of literature

The hymn also praises her for being the source of all spiritual abilities. And while the Ganges is considered an epitome of asceticism and higher knowledge and can grant us Moksha or liberation, it is Yamuna, who, being a holder of infinite love and compassion, can grant us freedom, even from death, the realm of her elder brother. She rushes down the Kalinda Mountain, and verily describes her as the daughter of Kalinda, giving her another name, Kalindi, the backdrop of Krishna Leela. The text also talks about her water being of the colour of Lord Krishna, which is dark (Shyam).

It is mention as Iomanes (Ioames) in the surveys of Seleucus I Nicator, an officer of Alexander the Great and one of the Diadochi, who visited India in 305 BC, later Megasthenes, a Greek traveller and geographer, visited India, sometimes before 288 BC, the date of Chandragupta's death, also mention the river in his text Indica, where he described the region around it as the land of Surasena.[14] In Mahabharata, Indraprastha, the capital of Pandavas was also situated on the banks of Yamuna, it is considered to the modern day city of Delhi.

Geological evidence indicates that in the distant past the Yamuna was a tributary of the Ghaggar River (also known as the Vedic Sarasvati River), but that it later changed its course eastward due to a tectonic event, becoming a tributary of the Ganges. This may have led to the Sarasvati River drying up, the end of manyHarappan civilization settlements, and creation of the Thar desert. However, recent geological research suggests that the diversion of the Yamuna to the Ganges may have occurred during the Pleistocene, and thus could not be connected to the decline of the Harappan civilization in the region.

The importance of the Ganges–Yamuna river basin, and the Doab region as traditional the seat of power, can be derived from the fact, in much of early history of India, most of great empires, which ruled over majority of India, until the Chalukyas King, Vinayaditya, were based in the highly fertile Ganges–Yamuna basin, including the Magadha (ca 600 BC), Maurya Empire (321–185 BC), Sunga Empire (185–73 BCE), Kushan Empire (1st–3rd centuries CE), Gupta Empire (280–550 CE), and many had their capitals here, in cities like Pataliputra orMathura. The government of India over the next five years has prepared plans to rebuild and repair the

sewage system and the drains that empty into the river. To address river pollution, certain measures of river cleaning have been taken by the Government's Ministry of Environment and Forests in twelve towns of Haryana, eight towns of Uttar Pradesh, and Delhi, under the Yamuna Action Plan (YAP) which has been implemented since 1993 by the National River Conservation Directorate (NRCD) of the Ministry of Environment and Forests. The Japan Bank for International Cooperation is participating in the Yamuna Action Plan in 15 of the above 21 towns (excluding 6 towns of Haryana included later on the direction of Supreme Court of India) with soft loan assistance of 17.773 billion Japanese Yen (equivalent to about Rs. 700 crore INR) while the Government of India is providing the funds for the remaining 6 towns added later. In 2007 the Indian government's plans to repair sewage lines were predicted to improve the water quality of the river 90% by the year 2010.

However in 2009, the Union government admitted to the Lok Sabha (Indian Parliament), the failure of the Ganga Action Plan (GAP) and the Yamuna Action Plan (YAP), saying that "rivers Ganga and Yamuna are no cleaner now than two decades ago" despite spending over Rs 1,700 crore to control pollution. According to a CSEofficial, these plans adopted the Thames model, based on a centralized sewage treatment system. This meant that huge sum of money and a 24-hr power supply were needed to manage the treatment plants, while only an 8-hr power supply was available, contributing to the failure of both river plans.[34] In August 2009, the Delhi Jal Board (DJB) initiated its plan for resuscitating the Yamuna's 22 km stretch in Delhi by constructing interceptor sewers, at the cost of about Rs 1,800 crore.

Research Methodology

The processes below are the ones commonly used in water purification. Some or most may not be used depending on the scale of the plant and quality of the raw (source) water.

Pre-treatment Pumping and containment – The majority of water must be pumped from its source or directed into pipes or holding tanks. To avoid adding contaminants to the water, this physical infrastructure must be made from appropriate materials and constructed so that accidental contamination does not occur.

1. Screening (see also screen filter) – The first step in purifying surface water is to remove large debris such as sticks, leaves, rubbish and other large particles which may interfere with subsequent purification steps. Most deep groundwater does not need screening before other purification steps.

2. Storage – Water from rivers may also be stored in bankside reservoirs for periods between a few days and many months to allow natural biological purification to take place. This is especially important if treatment is by slow sand filters. Storage

An analysis of the slum assessment findings revealed the following situation:

• A large number of slums are located near dirty, open 'nalas'. This leads to higher malaria, diarrheal disease incidence in these slums.

• Slum dwellers have individual sources of water (taps / handpumps) in most slums.

However, water supply is generally limited to 2-6 hours in a day. Water quality is poor (yellowish, hard water, smelly) in a few slums.

• Sanitation is the most pressing issue in a majority of slums with situations varying from existence of individual toilets which lead into open drains to a total absence of individual or public toilet facility. Children defecate in drains in most slums.

• Drains are open and narrow, which remain blocked due to disposal of solid waste and no regular cleaning. Regular cleaning is done in 'better off' slums where residents pay monthly charges to private cleaning staff.

The slum assessment will reveal that about 20 % of the slums exist in the Trans Yamuna area and that the slums in this area are largely scattered. In contrast, the slums in Rakabganj area, which is also part of the old city, are highly congested and the density of population in these settlements is fairly high. reservoirs also provide a buffer against short periods of drought or to allow water supply to be maintained during transitory pollution incidents in the source river.

Hypothesis

River environmental management depend on interactions between river, environment and human infrastructure, including the interactions between ecology, hydrology, water quality, climate, flooding, public sanitary facilities, waste water inputs and waste water treatment facilities. Thus a river directly as well as indirectly reflects the environmental management system facilities of any town, city, state and country. To protect Yamuna River from the pollutants some of the important steps should be taken immediately such as.

Conclusion

Several water treatment technologies prevailing in West are very expensive and country like India cannot afford it. Besides, that the conventional water treatment processes, based on chemical coagulation and filtration or biological slow sand filtration, have little capacity to remove water-soluble pesticides. Therefore emphasis should be given to the easily feasible and economically feasible techniques capable of removing or minimizing the pesticides content from the water.

Waste water discharges in rivers destroy marine lives; degrade the environment, and causes water shortage and waterborne diseases. Their proper management and treatment is necessary because it reduces or removes the organic matter, solids, nutrients, disease-causing organisms and other pollutants from the wastewater before it is discharged to river water. Delhi alone contributes around 3,296 MLD of sewage water in Yamuna River. Therefore it is imperative to take necessary action and promotes the following strategies.

There are number of Government, semi-government, NGO's, private companies and environmental agencies are available which are working in the field of wastewater management. These organizations should be encouraged to work on the waste management techniques and can be financed through projects, schemes.

The status of sewerage systems especially in the cities, towns and blocks all along the Yamuna River course is extremely bed, due to this large quantity of untreated or partially treated sewage water mixed with river water. Further many cities, small towns and blocks do not have the sewer system facilities. The existing sewer system improvement and formation are needed to reduce the risk of seepage of sewerage water

and material into the groundwater and river, especially during rainy seasons.

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