

Man-made wetlands to treat wastewater

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In news

In order to reduce some load of untreated sewage that flows into the Yamuna, authorities in Delhi are planning a method to naturally treat around 1,500 million litres per day (MLD) of wastewater that goes into the river.

What is the difference between Natural wetland and Man-made Wetland?

- Natural wetlands are ecosystems that are either permanently or seasonally saturated in water, creating habitats for aquatic plants and conditions that promote the development of hydric (wetland) soils
- A man-made wetland is an artificial wetland to treat municipal or industrial wastewater, greywater or stormwater runoff. Man-made wetlands are engineered systems that use natural functions vegetation, soil, and organisms to treat wastewater.

A new & unique experiment

- At the South Delhi Biodiversity Park, being created by the Delhi Development Authority (DDA) on around 200 hectares of land behind Kalindi Colony, Delhi University professor CR Babu(heads Delhi University's Centre for Environmental Management of Degraded Ecosystems (CEMDE)) is making 11 constructed wetland systems.
- At the South Delhi Biodiversity Park, one out of 11 constructed wetlands started functioning on December 18 this year, treating about 15 MLD of waste from the Kilokari drain.

His previous experiment

Professor Babu successfully used the constructed wetland system to revive a lake at Neela Hauz biodiversity park in the city in 2016.

How do these wetlands will work?

The constructed wetland systems will **use boulders and a variety of plants to naturally treat sewage** from 25 drains, stretching from Okhla to Kalindi Colony, before it enters the river.

Methods and process of wastewater treatment

- **Methods of wastewater treatment involve a three-step process, which does not require electricity.** At the mouth of the drain, a team of scientists led by Prof Babu have made a one-acre wide wetland from boulders and plants.
- **The drain opens into an oxidation pond, which is the first step of the treatment process.** Here the solid material in the waste is removed from a wire mesh and atmospheric oxygen dissolves in the water.
- The water then travels further and passes through channels and small ridges made from boulders, which **creates turbulence and causes aeration**
- **Aeration brings water and air in close contact, introducing small bubbles** of air which rise through the water and **remove dissolved gases in it.**
 - Prof Babu says **“Higher turbulence means better oxygen saturation and better quality of water.** Waterfalls have maximum oxygen saturation and, therefore, have very good water quality”.
- **The final step in the treatment process happens when water passes through 25 species of plants – including typha, phragmites, ipomoea and cyprus** which are effective in the treatment of heavy metals, including

arsenic.

Recharging the river

After all the above steps, treated water is released into the river through wetlands stretching from Dhobi Ghat in Okhla to DND flyway near Kalindi Colony, a team headed by prof Babu will check the quality of water being released into the river through this constructed wetland.

The same process has increased the concentration of dissolved oxygen (DO) at Neela Hauz biodiversity park lake which used to receive untreated sewage through drains from nearby areas to 4 milligrams per litre, close to the criteria for DO required for propagation of fish in the water