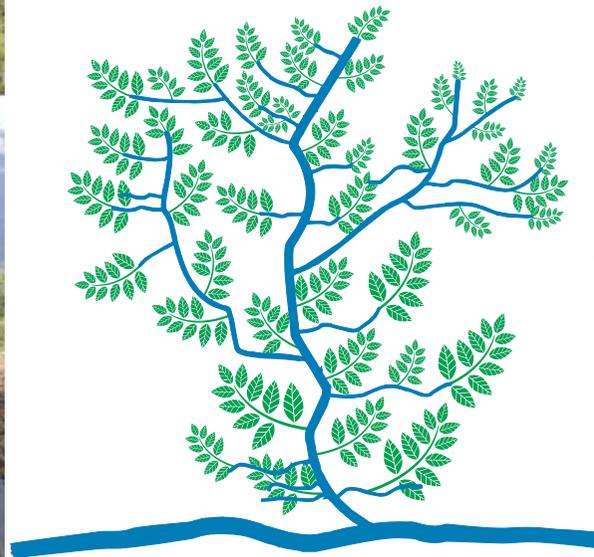
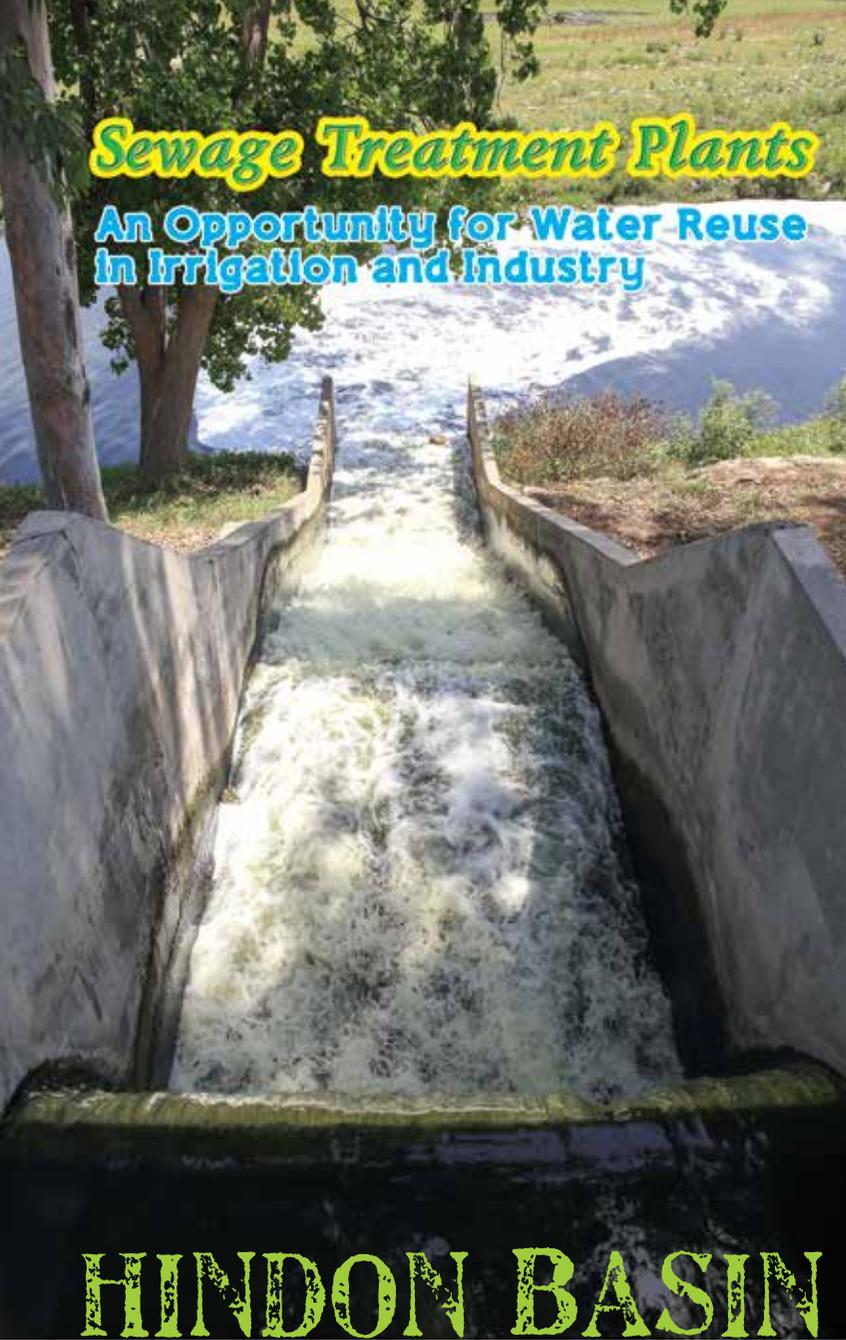


Sewage Treatment Plants

An Opportunity for Water Reuse
in Irrigation and Industry



Hindon River, a tributary of Yamuna, originates in Saharanpur District and finally meets the river Yamuna in Noida after traversing a distance of ~300kms. In cities/towns falling within the Hindon catchment, **sewage treatment facilities** were constructed to **prevent** release of **untreated wastewater** into the **river**. Having fulfilled their intended purpose, all of these treatment facilities offer huge **potential** for **augmentation** and **upgradation** for **water reuse**, which is the need of the hour in order to **conserve** fresh **water** resources.

Pollution caused by domestic wastewater which is also referred to as 'sewage' is one of the primary causes for degradation of water resources. The situation gets progressively worse when cities and towns experience growth as a result of planned as well as unplanned expansion making it critical to have a functioning Sewage Treatment Plant (STP). The challenge lies in not just bridging the widening gap between sewage generation and treatment capacity but to go beyond. Effectively, this means developing facilities to divert treated sewage for different purposes such as in irrigation to utilise nutrient value of sewage as well as industrial production

thereby reducing burden on fresh water use. The existing Water (Prevention and Control of Pollution) Act 1974 recognises its importance and permits states to do. Along the Hindon's route in Uttar Pradesh, there are two STPs located upstream of the river at Saharanpur and Muzaffarnagar which are 16 years old constructed under Yamuna Action Plan-I (YAP-I) while the STP at downstream Greater Noida is relatively new and part of a more organised town planning effort. The primary objective of all three STP's is to ensure that sewage collected at the plant is treated effectively for conventional pollutants so as to comply with current discharge norms.



Resource Recovery from Saharanpur STP

A 38 MLD STP based on UASB+PP technology was constructed in year 2000 under YAP - I at Saharanpur. The project was executed by Uttar Pradesh Jal Nigam and is being run by the Jal Kal Nagar Nigam, Saharanpur. The primary objective of the STP was to reduce pollution level in the river Dhamola which is a tributary of Hindon that finally meets the Yamuna River.

The Saharanpur STP continues to function well while operating at full capacity even after a period of over 15 years. The UASB technology requires no process energy for operation of the plant. Interestingly, the STP is self-sustainable to a certain extent by producing sufficient bio-gas to run its own operations. The STP has a dual fuel generator (180 KVA) that is technically equipped to run with a ratio of 70% bio-gas and 30% diesel for five hours. This can be a model for STPs

that are constrained on account of frequent power outages, leading to faulty operations and treatment inefficiency.

An upgradation proposal including an additional 600 kms of sewerage pipelines under the Amrut Yojana has been submitted. This will be serviced by two new treatment plants at Nazirpura and Badshahpur increasing the total capacity to 84 MLD with completion expected by 2020. The existing treatment plant will also see a switch from the current UASB to an advance treatment technology in order to comply with proposed stricter discharge norms.

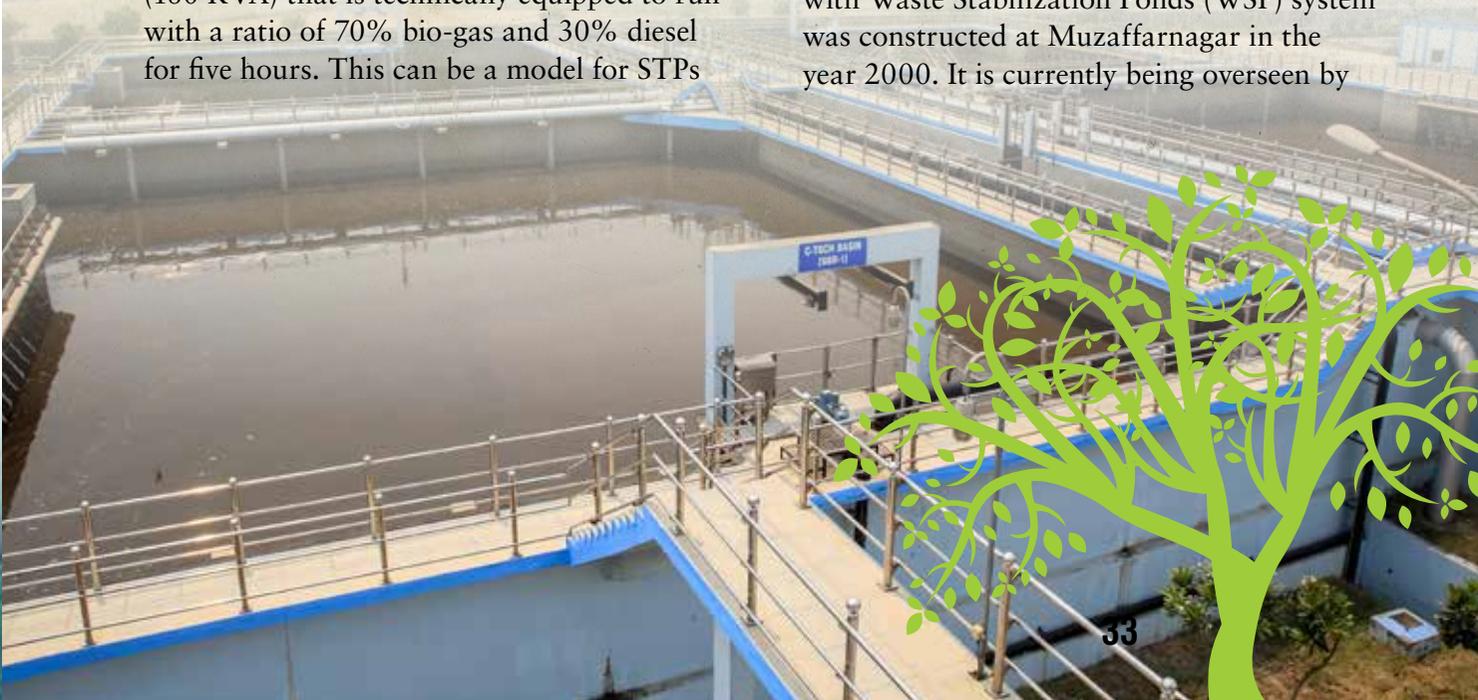
Converting Existing Ponds to Constructed Wetlands for Water Quality Improvement

Under the YAP-I, a 32.5 MLD capacity STP with Waste Stabilization Ponds (WSP) system was constructed at Muzaffarnagar in the year 2000. It is currently being overseen by



“If Saharanpur has to be a Smart City under the Government of India mission, the upgradation of the STP will be a key component along with capacity building of the Nagar Nigam”

*PK Gupta, General Manager,
Jal Kal Nagar Nigam, Saharanpur*





the Muzaffarnagar Nagar Palika. The WSP system comprises of anaerobic, facultative and maturation ponds in series that works on the natural process of degradation. Improper operation & maintenance of the STP due to constraint in funds and the lack of qualified personnel has resulted in WSP system not meeting the discharge standards. On a positive note, a proposal to upgrade the STP is currently under evaluation with the UP Jal Nigam which is an urgent requirement for the fast growing city of Muzaffarnagar. The WSP system can be easily converted into Constructed Wetlands as this technology involves media and vegetation at shallow depths to produce a very fine effluent quality. This proven technology doesn't require highly skilled personnel and has relatively lower maintenance cost. Under the Indo-Euro bilateral program on water technology, a demonstration scale Constructed Wetlands has been developed at Aligarh Muslim University for water recycling and reuse.

An efficient STP to help Greater Noida achieve “zero discharge city” status by 2021

When planning an STP, the complexities of the city growth patterns needs to be taken into account. Noida, a city known for its urban planning has 81 villages that are zoned by their panchayat but utilize civic facilities

provided by the Noida Authority. Therefore, the challenge is not so much about the water treatment per se, rather the collection and transport of sewage to the STP without leakages. The STP in Greater Noida is a joint partnership between Noida Authority and HNB Engineers Private Ltd., Pune. It is a 35 MLD plant based on SBR technology that was operationalised in 2012. In the case of Greater Noida where land is expensive and not so easily available, compact systems like SBR or MBR are suitable.

Interestingly, although Greater Noida was formed in 1991, the city did not have adequate sewage treatment facilities which meant that all untreated wastewater was discharged into the Hindon until a few years ago. This state-of-the-art plant ensures treated water is released into the Hindon River. A portion of the treated effluent is sold to real estate developers in Gautam Budh Nagar. The STP also has a demonstration ultra-filtration unit which treats water to standards fit for human consumption; however, perception issues on STP treated water prevent it from being scaled up. According to the Noida Master Plan for 2021, six new STPs are being planned to support the growth of the Greater Noida with the aim to use 100% of treated sewage for different purposes.



Reflections, Challenges & Way Forward

Hindon is a heavily polluted river with many complexities; made severe by the fact that it is rain fed river. While some efforts have been made in the past, strong will and vision is needed to adopt a holistic approach to deal with the pollution of the Hindon River involving communities, farmers, industry as well as government. The approach includes water reuse for agricultural purposes and by the industry.

*Dr. Nadeem Khalil, Associate Professor
(Environmental Engineering) in the
Department of Civil Engineering,
Aligarh Muslim University*