About the Project

The FP7 project "*Saph Pani* - Enhancement of natural water systems and treatment methods for safe and sustainable water supply in India" addresses the improvement of natural water treatment systems such as river bank filtration (RBF), managed aquifer recharge (MAR) and wetlands, building on a combination of local and international expertise. The project aims at enhancing water resources and water supply particularly in water stressed urban and peri-urban areas in different parts of the sub-continent. The project focuses on a set of case study areas in India covering various regional, climatic, and hydrogeological conditions as well as different treatment technologies.

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Experiences with constructed wetlands and other natural treatment systems for wastewater treatment and reuse in india

In the present study (WP3) a detailed assessment of Constructed Wetlands (CWs) and other natural treatment systems (NTSs) has been carried out by IITB team across India in order to get the experiences for wastewater treatment and reuse.

Site visits and data collection across India

During the assessment of CWs and other NTSs across India, potential sites were identified for assessment. Identified sites of STPs based on CWs and other NTSs were visited and secondary data were collected by interviewing the operating staff of the respective STPs as well as by utilizing the literature, log books, and progress reports supplied by the respective personnel.

Assessment of NTSs

The assessment of selected STPs were planned to complete in two phases; first the rapid national survey of identified engineered CWs and other NTSs and secondly the detailed assessment of selected representative sites. During second phase of assessment, in-depth evaluations of selected case studies were

carried out in detail for their reuse potential and other special functions.

Total 40 sites of NTSs (visited) comprises of Waste stabilization Ponds (WSPs, 23 No.), Duckweed Ponds (DPs, 3 No.), Polishing Ponds (PPs, 7 No.), Constructed Wetlands (CWs, 5 No.) and Karnal Technology (KT, 2 No.). It was observed that PPs happens to be the most commonly practiced NTSs in India - which contributes nearly 53% of total wastewater treated by the means of NTSs (total load serviced by NTSs is around 1838 MLD). PPs have been employed for municipal as well as industrial wastewater treatment all over India after Un-Anaerobic Sludge Blanket (UASB) units for improving the quality of treated effluents by means of the anaerobic biological reactor. WSPs are also equally practiced since they account for nearly 45% of total wastewater treated by means of NTSs in India. However, KTs for on-land disposal of wastewater, engineered CWs as well as DPs have seems to cater lower amount of wastewater as compared with total load serviced by NTSs, but there number are significant – which is the direct indication that these treatment technologies (KTs, CWs and DPs) are used as decentralised systems for wastewater treatment. Therefore, the NTSs including KTs, CWs and DPs, which are at present running to cater lower amount of wastewater, may play a significant role in development of proper wastewater management and treatment in India where low-density communities and varying site conditions prevails (Arceivala and Asolekar, 2007).

Technology Practices of NTSs across India

There are different types of NTSs practiced in India (depicted in Picture 1 to 6) and the most practiced include: WSPs, SPs, CWs, Sewage fed Aquaculture, PPs, DPs, and KTs.

Pictures (1-6) : Different kinds of NTSs operated in India for wastewater treatment and reuse (from left to right)

1: 13 MLD Waste Stablization Pond, Agra, India
2: 50 KLD Constructed Wetland, Bhopal, India
3: 8 MLD Sewage Fed Aquaculture, Karnal, India
4: 40 MLD Polishing Pond, Karnal, India
5: 0.5 MLD Duckweed Pond, Ludhiana, India
6: 1.79 MLD Karnal Technology, Ujjain, India

The duckweed based wastewater treatment system in conjunction with pisciculture is one such technology has the potential of offering effective wastewater treatment besides providing economic returns as well as generating employment opportunities in the rural areas (Arceivala and Asolekar, 2012).

All wastewater treatment systems based on NTSs have been design and operated in order to meet the regulatory standards prescribed by CPCB, New Delhi for reuse or discharge into the water body. The major reuses of treated domestic wastewaters from NTSs in India are irrigation of agricultural fields and gardens. Another substantial use has been for depositing into sewage fed aqua-culture ponds. In most of the cases, the treated effluent from NTSs directly reused in agriculture or disposed into adjoining river.

References

Arceivala SJ and Asolekar SR, (2007) "Wastewater Treatment for Pollution Control and Reuse" Tata-McGraw-Hill, New Delhi.

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