

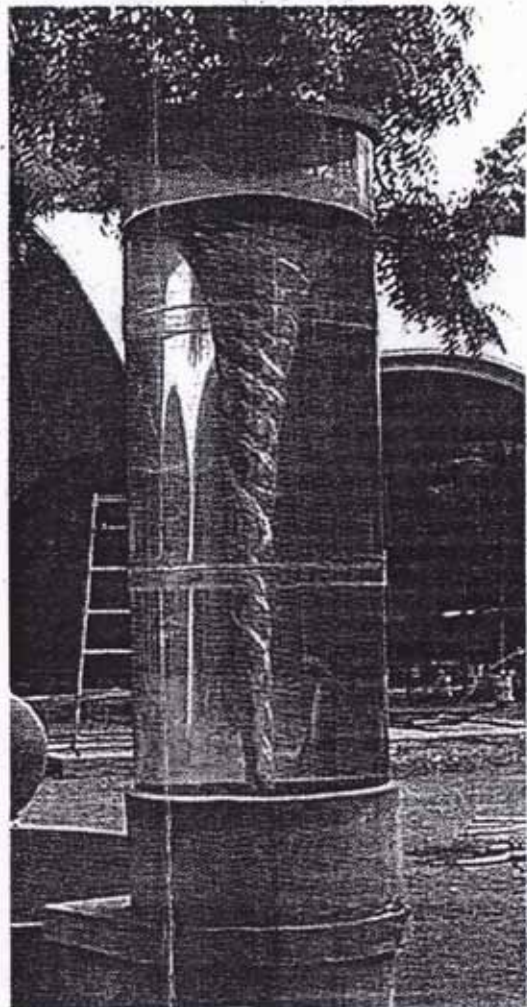
# SUSTAINABLE WASTE WATER TREATMENT SYSTEMS FOR CITIES

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The Vortex system can help treat waste effectively in a decentralised way, says DURGANAND BALSAVAR

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With urbanisation and considerable increase in water consumption, the amount of waste water generated by cities of Asia-Pacific is reaching alarming proportions. Much of this waste water is often let off untreated into canals, rivers or the sea. Highly mechanised treatment plants are an expensive proposition for Indian cities and require very high levels of skill for sustained maintenance and hence often experience breakdowns and failure. "In contrast, DEWATS (Decentralised Waste Water Treatment Systems) requires minimal maintenance and consumes very low running energy when compared to conventional aerobic technologies," suggests Tency Baetens, working at the Auroville Center for Scientific Research. For several decades, Tency has been researching waste water treatment systems.

Until recently, the resistance to implement cost-effective natural treatment systems like the Planted Gravel Filter (PGF) had been the large tracts of land required to filter waste water. Tency has now evolved an effective and innovative system to treat urban waste water - the Vortex system. The vortex system is more efficient, controls bad odour and uses considerably much less space.

Natural decentralised waste water treatment systems combine several natural physical treat-

ment techniques to achieve the desired effluent characteristics. Primary, secondary and tertiary treatment takes place in underground anaerobic devices. The critical parts run uninterrupted and have a life cycle of several decades. Such systems can treat effluent flows from 1 to 1000 m<sup>3</sup> per day in an urban context like Chennai. These systems are also capable of handling fluctuations in inflow, which are likely across the year, during festivals, etc. They need little maintenance and require low energy for running.

Several affordable housing projects are gradually exploring these treatment systems also given the long-term need to protect groundwater from contamination. For instance, Value & Budget Housing Corporation (VBHC) Pvt Ltd, a developer committed to affordable and sustainable housing projects, were keen on implementing Dewats due to its low maintenance costs. VBHC is now pioneering the implementation of the innovative Vortex-Dewats treatment to meet its sustainability goals.

The Vortex eliminates bad odour completely using a tiny footprint. It retains all the advantages of a natural system - with no chemicals added, minimal energy use, easiness of installation, very little maintenance, and above all a major cost advantage over a PGF.

Tency Baetens describes a Vor-

tex equipped waste water treatment system as a vertically positioned tube mounted on a funnel-shaped base. The waste effluent is directed into the device either by means of an electrical pump or by gravity. The incoming effluent starts a swirling movement facilitated by the specially designed funnel shaped base element. Within the tube a continuous vortex movement appears. The opening at the bottom ensures a balance between incoming and outgoing effluent streams. It is in fact an artificially created, controlled tornado in a tube to harness the energy from such a natural force for cleaning waste water.

The integrated vortex system operates atop an underground anaerobic treatment module, effectively eliminating all odours. Its compactness and ease of operation enables decentralised waste water installations in small spaces, even near buildings, thus reducing sewage pipes - a major cost item. Importantly, Tency clarifies, that this improved intervention eliminates over 90% of the pollution in the waste water enabling its safe reuse for flushing and gardening. This system meets all the regulatory requirements for treated waste water.

This system has been extensively researched, developed, and refined in Auroville.

The Vortex-Dewats enables towns and cities to benefit from

the basic premises of natural Dewats: low energy use making it more sustainable, with minimal maintenance and affordable treatment costs.

Most importantly, a viable alternative to the maintenance intensive conventional Aerobic systems has emerged to make waste water treatment much more viable. The implementation of this system is in progress at an affordable housing project called Vaibhav in Bangalore, being implemented by VHBC Pvt Ltd. It will implement a large scale, 730 m<sup>3</sup>/day Vortex-Dewats. The company worked in partnership with the Auroville Centre for Scientific Research team to explore the benefits of the technology, its feasibility and use.

Similar systems have been envisaged in Chennai and can enable the creation of ecologically sensitive neighbourhoods in the city, especially in far-flung suburbs that often forced to resort to unhygienic practices of disposing waste water since drainage facilities are still under construction. Towns in Gujarat are experimenting with these systems and some of them in Bhuj have been implemented with the desired results of creating sustainable cities.

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