DWWTS at Aravind Eye Hospital, Puducherry, India

Country: India
Landuse: Neighbourhood
Scale: Neighbourhood
Objectives: Compliance to State Pollution Control Board standards, Accommodating and installing a low maintenance wastewater treatment plant in the space available, Huge requirement of water for landscaping
Ownership: Private
Intervention: Project

Location

Capacity: 320 KLD
Area: 2690 sq. m

Background

Aravind Eye Hospital located on the east coast highway between Pondicherry and Cuddalore, serves the eye care needs of the people of Pondicherry and neighbouring districts of Tamil Nadu. The ratio of free beds to paying beds being 4:1, there are 600 beds for free patients and 150 beds for paying patients. The hospitals outpatient department can handle 1500 patients per day.

Objectives

Compliance to State Pollution Control Board standards, Accommodating and installing a low maintenance wastewater treatment plant in the space available, Huge requirement of water for landscaping

Timeframe

Operational since: February 2003
Construction Period: 8 months

Authorities Involved

Implementing Agency: Aravind Eye Hospital
Project Description

The Aravind Eye Hospital in Thavalakuppam near Puducherry is a renowned hospital. It treats its wastewater through a DWWTs and reuses the treated wastewater. The institutional-scale DWWTs at the hospital, operational since 2003, is designed to treat 320 KLD of wastewater on a daily basis. Both grey and black water is treated by the DWWTs technology and the treated water is reused for maintenance of the 15 acres (6.07 hectares) of sprawling garden. Use of treated wastewater of about 200,000 litres (except during monsoon) is used for green landscape in the hospital campus with an estimated saving of about Rs 240,000 annually.

Strategies and Interventions

Features:

- The DWWTs is based on a natural process. It uses no chemicals for treatment.
- The DWWTs consists of a grease trap, settler, anaerobic baffled reactors (ABR), planted filter bed (PGF) and polishing pond for treatment. The system has been incorporated as part of landscape design at the site.

Black and grey water streams are separated and treated in the following modules:

Settler, Baffled reactor, Anaerobic filter, Planted gravel filter and Polishing pond. The treatment takes place by sedimentation, anaerobic degradation, sludge stabilisation and facultative degradation of organic matter followed by pathogen removal by ultra-violet radiation in the polishing pond.

The grey water and the black water generated in the hospital premises first enter into separate two chambered settlers. The settlers for black water treatment are integrated with the anaerobic baffled reactors. The partially treated black water then undergoes secondary anaerobic treatment through baffled reactors. The black water and grey water is collectively passed through anaerobic filter and then to the series of horizontal gravel filters planted with *Canna indica*. Final treatment is done through polishing ponds where the water is stored also for further reuse.

Figure: Typical drawing of the system
Outcomes of the Project:

BOD reduction: 98%
COD reduction: 96%
TDS reduction: 96%
(Source: CDD Society, Bangalore)

Reuse of treated water for gardening. Sludge is transformed into good manure through composting.

The hospital uses about 250,000 litres of water every day of which about 200,000 litres is treated and reused to water the gardens.

Operation and Maintenance

The wastewater treatment plant is operated and maintained by the O & M team and the trained gardener of the hospital. A regular schedule is followed for maintenance, like periodical check of sewer line systems, removal of sludge in settler, baffle reactor and anaerobic filter. In the planted gravel filter regular harvesting of plants is done. The filter media of both planted gravel filter and anaerobic filter is washed once in five years. Operating charges are exclusively electricity charges that cost Rs. 2,19,000/- annually. [There are 4 motors of 7.5 hp that run 8 hours a day.] The maintenance is carried out once in 3 years costing approximately Rs. 30,000/-. The annual O&M charges are therefore Rs. 2,19,000/-.

Funding and costs

Capital cost : 1.12 crore
Construction Cost : Rs. 91.83 lakhs
O&M: 2.5-3 Lakhs per year
Additional/ Further information:

References and Sources:

Website: [https://aravind.org/](https://aravind.org/)
Video: [https://www.youtube.com/watch?v=43t60aSc3yU](https://www.youtube.com/watch?v=43t60aSc3yU)

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