

CASE STUDY: GREY WATER MANAGEMENT AT MOZARI IN AMRAVATI, MAHARASHTRA

Location:	Amravati, Maharashtra
Waste input type:	Grey water
Value offer:	Sustainable grey water management solution for six villages in Mozari in Amravati, Maharashtra
Organization name and type:	CDD Society
Major partners:	Maharashtra Jeevan Pradhikar, CDD Regional Office, Nagpur

Executive Summary

Under the Mozari development plan, six villages in Amravati district in Maharashtra were selected to pilot a liquid waste treatment facility. Wastewater from four villages was being discharged directly into the Surya Ganga river – significantly polluting the river and affecting its users downstream.

As part of this project, wastewater from the households was directed into a decentralized wastewater treatment system called DEWATS, which includes a Screen Chamber cum Settler, an Anaerobic Baffled Reactor integrated with Anaerobic Filter and a Planted Gravel Filter. Effluent quality was maintained to meet regulatory limits set by the Pollution Control Board (PCB). The treated wastewater was fit for reuse for non-human contact purposes, and this project prevents environmental pollution due to direct discharge of untreated wastewater into water bodies.

Background and Context

As part of the Mozari development plan, six villages were selected for a liquid waste treatment project. Sanitation facilities in these villages were poor and their wastewater was discharged without any treatment to a nearby river.

The DEWATS system was proposed for the treatment of domestic wastewater. Influent quality of wastewater was found to be BOD - 300 mg/L, COD - 600 mg/L, TSS - <200 mg/L. Expected quality of treated effluent is BOD - <30 mg/L, COD - <60 mg/L, TSS - <100 mg/L and no E coli. Work on the project began in January 2016 and ended in October 2016, at a construction cost of INR 42.22 lakh.

The project was funded by Maharashtra Jeevan Pradhikar and supported by CDD's regional office, in Nagpur. The project was executed by Amravati-based Sainath Infraland. The purpose of the project was to treat wastewater to meet regulatory norms, and to reuse treated wastewater for non-human contact purposes. Operation and Maintenance (O&M) cost for the plant is approximately INR 34,500, which includes labor charges for one part-time sanitary worker, cost incurred on regular cutting of plants in plant gravel filter, and regular cleaning of the DEWATS system. No electricity is needed because the treatment system is completely gravity-based.

Technology and Process

The grey water generated from households along with overflow from septic tanks is conveyed through open drains. Wastewater currently going to drains is diverted into DEWATS™ modules for treatment. The modules include Screen Chamber cum Settler, Anaerobic Baffled Reactor integrated with Anaerobic Filter and Planted Gravel Filter.

The Settler-Screen Chamber removes heavier and lighter particles by sedimentation and floatation. The Baffled Reactor ensures anaerobic degradation of suspended and dissolved solids by mixing fresh wastewater with an active sludge blanket.

The Anaerobic Filter comprises a filter bed for treatment of dissolved organic matter. Wastewater comes in contact with an active bacterial mass that grows on the filter material. The Planted Gravel Filter is used as a tertiary treatment unit in which aerobic and facultative degradation of dissolved organic matter occurs.

Table 1. Details of treatment modules

Unit	Volume, m ³	Area, m ²
Settler	64.80	42.68
Screen chamber	6	5.39
Anaerobic baffled reactor+ anaerobic filter	945.50	145.44
Planted gravel filter	40.50	72.25

Figure 1. Schematics of the treatment module

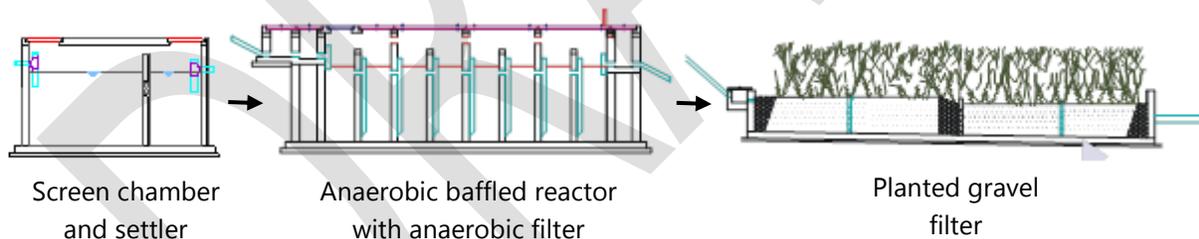
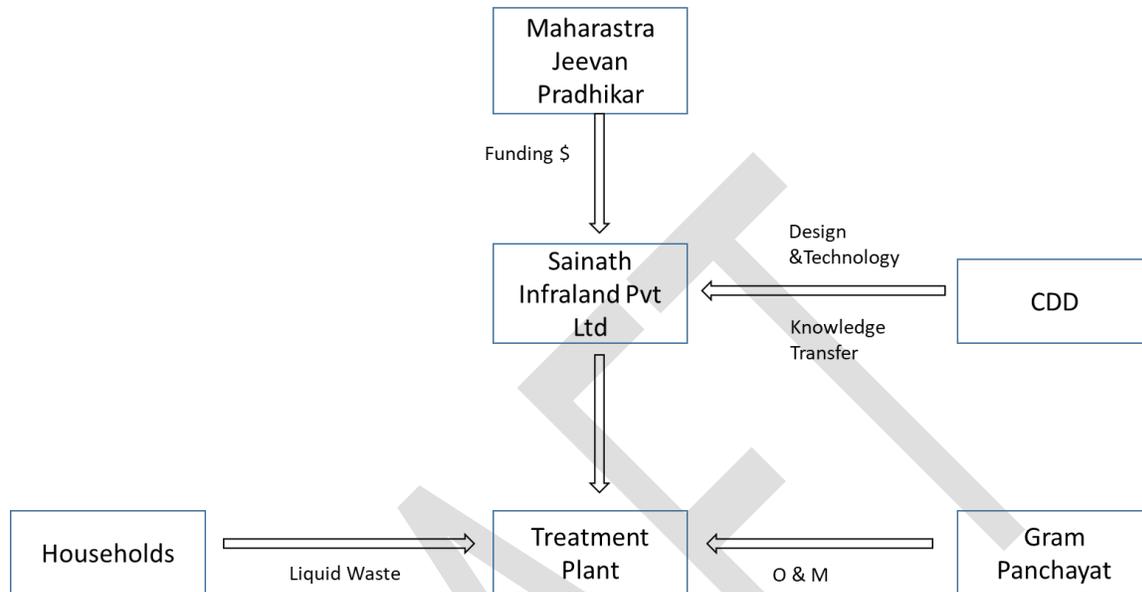


Figure 2. Pictures of planted gravel filter and DEWATS module



Value Chain and Business Model

This project was funded by Maharashtra Jeevan Pradhikar and supported by CDD's regional office, Nagpur. The project was executed by Amravati-based Sainath Infraland. The gram panchayat manages operation and maintenance of the treatment plant at the village level.



Conclusion

Grey water management in Mozari's six villages is based on the DEWATS system, which provides treated water that complies with regulatory limits and avoids environmental pollution. Its treated water can be reused for non-human contact purpose or discharge into nearby river.

The regular maintenance schedule that should be followed includes periodic checks as well as removal of sludge from the baffle reactor. Regular harvesting of plants is needed in the planted gravel filter, and the filter media must be washed at regular intervals.

Notes and References

Fact sheet, DEWATS™ for Mozari's villages (Part-B) at Amravati district, Maharashtra, CDD-BORDA

Key Indicators	
Waste water quantity managed, m ³ /day	100
Land requirement, sq. mtr.	266
Capital cost, INR	46,22,000
Annual O & M cost, INR	34,500
Energy consumption, KWH / KL / Yr	No energy consumption as the system is gravity-based
Output	Liquid waste management using DEWATS module for villages in Mozari in Amravati, Maharashtra
Social and/or environmental impact/ other	<ul style="list-style-type: none"> - Reduced environmental pollution - Reuse of treated water for non-human contact purposes - Improved quality of life of villagers