



Faecal Sludge Treatment Plant

KUKKUNDOOR, UDUPI, KARNATAKA

PROJECT BRIEF

The first phase of *Swachh Bharat Mission – Grameen* (SBM-G) (2014-19) focused on making all villages in India open defecation free (ODF) - through the provision of individual household or community toilets.

The second phase, which started in February 2020, focuses on sustaining these ODF efforts by encouraging continued use of toilets and through solid-liquid waste management (SLWM).

As part of efforts under the second phase, The Rural Drinking Water and Sanitation Department, Government of Karnataka, issued a State Policy and Strategy for Sanitation and Waste Management in rural areas as well as model bye-laws. This is being followed by the implementation of liquid waste treatment initiatives in 16 *Gram Panchayats*, which will serve as pilots for the rest of the state. One of these *Gram Panchayats* is Kukkundoor in Udupi District.

PROJECT OUTCOMES

Assess gaps across the sanitation value chain in the *Gram Panchayat*; and implement a sustainable, cost-effective and appropriate Faecal Sludge Treatment Plant (FSTP) along with supporting systems to safely treat the faecal sludge generated within a cluster of 9 *Gram Panchayats* (i.e. covering a radius of 15 kms from the FSTP site).

REUSE OPTIONS

1. Treated wastewater for landscaping
2. Bio-solids in agriculture

O&M Activities

Operation tasks

1. Daily monitoring of the plant
2. Removal of collected solid waste from the screening chamber

Maintenance tasks

1. Removal of bio-solids from the planted drying beds after the drying period.
2. Desludging the integrated settler and filter chambers.
3. Cleaning of the filter media in the planted drying beds.
4. Cleaning of the filter media in the planted gravel filter.
5. Trimming of plants in planted gravel filter.

SALIENT FEATURES

- Source of faecal sludge:** Single pits
- Design capacity:** 6 kilo litres per week (klw)
- Population covered:** 62,439 (cluster of 9 GPs)
- TS inlet quality:** 30,000 mg/L
- Influent Quality:** BOD: 6,000 mg/L
COD: 30,000 mg/L

PROJECT SPECIFICATIONS

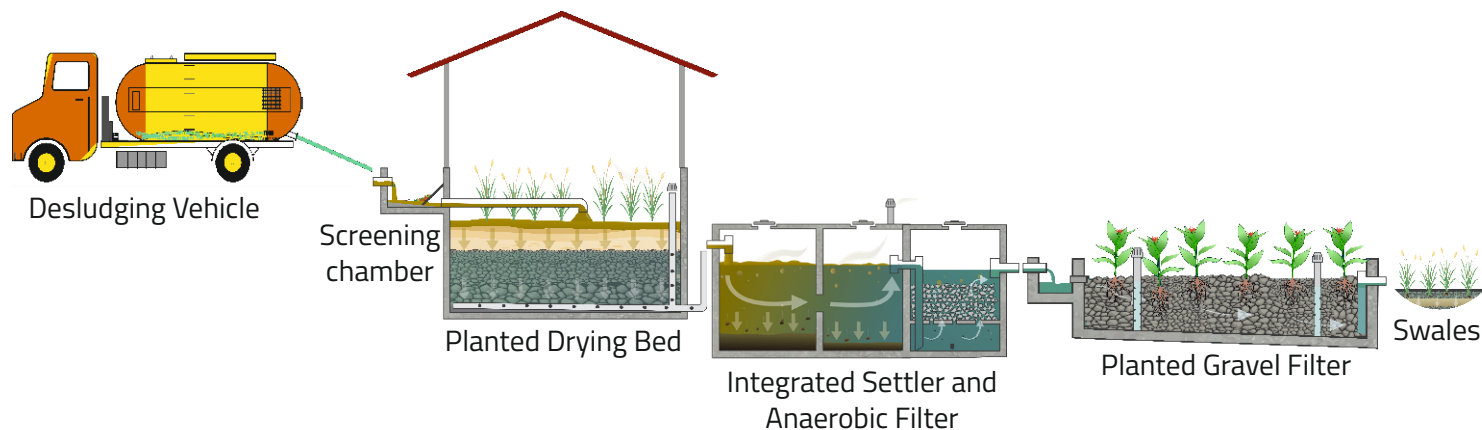
- Implementing agency:** Rural Drinking Water & Sanitation Department, Government of Karnataka
- Technical partner:** CDD Society
- Constructed By:** M/s. Global Technologies
- Implementation cost:** Rs.53 Lakhs
- Operation and maintenance cost:** Rs.1.4 Lakhs per annum
- Construction period:** 4.5 months
- Commissioning date:** 23rd February 2022

MODULES ADOPTED

Components	Area of Construction
Screening chamber	2.0 m ²
Planted Drying Beds	4 beds*20.25 m ² = 81m ²
Integrated Settler and Anaerobic Filter	9.5 m ²
Planted Gravel Filter	14.07 m ²
Swales	4.00 m ²
Other Civil Structure	174.25 m ²
Total Area	284.82 m²



TREATMENT PROCESS



SYSTEM IN BRIEF

The Faecal Sludge Treatment Plant consists of modules for sludge drying and liquid treatment, as follows:

Sl.No	Module	Treatment Objective
1	Screening chamber	As the first module of the FSTP, it helps in trapping all the solid waste and inorganic solids like plastics, cloth, sand, silt etc. present in the faecal sludge.
2	Planted Drying Beds	This is the main module of treatment which consists of a filter bed with graded filter media and plantation of emergent macrophytes, which help in not only dewatering and drying of sludge but also in some amount of stabilization through nutrient absorption. The first set of 2 beds receive faecal sludge alternatively, which is allowed to dry for a week after every loading. Once these 2 beds get filled, they are left for 6 months to dry completely. At the end of this drying period, bio-solids are obtained from these beds and can be used for agriculture. During the resting period of 6 months, the next set of 2 beds are used and loaded with faecal sludge. The percolate is collected in a drain with a perforated top slab and sent to the liquid treatment module.
3	Integrated Settler and Anaerobic Filter	Primary and secondary treatment of the percolate is first done through a 2-chambered anaerobic settler to remove the settleable solids. This is followed by a single chambered anaerobic filter to trap and remove further organic matter by the filter media. This is followed by a single chambered anaerobic filter to trap and remove further organic matter by the filter media.
4	Planted Gravel Filter	A horizontal planted gravel filter provides tertiary treatment of percolate to remove the nutrients and any residual colour and odour present in the outflow from the previous module.
5	Swales	The final module includes swales, which provides further treatment and infiltrates water as it flows through.



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