**SUSTAINABLE GREY WATER MANAGEMENT CASE STUDY AT SAVDA GHEVRA, DELHI**

| | |
|---|---|
| **Location:** | Savda Ghevra, Delhi |
| **Waste input type:** | Grey water / wastewater |
| **Value offer:** | Sustainable grey water management solution for Savda Ghevra in Delhi |
| **Organization type:** | Private |
| **Major partners:** | Water Aid India, International Water Management Institute (IWMI), Centre for Urban and Regional Excellence (CURE) |


**Executive Summary**

Savda Ghevra is a resettlement colony with a population of 36,000 in the Najafgarh area, around 40 km north-west of central Delhi. Developed by the Delhi Urban Shelter Improvement Board (DUSIB) in 2006, it has neither piped water supply nor a sewerage network. The grey water from its households (HHs) is released into its drains, while its black water goes to containment structures located beneath each HH. With the grey water – coupled with solid waste thrown into drains – posing a serious environment and health hazard, and HHs frequently needing to desludge their holding tanks (for which they spend INR 1,200-1,500 every year), there was an urgent need to address both the grey and black water issues with a low-cost, sustainable solution.

Considering that the settlement stands on a weak foundation and has narrow roads, the most practical and relevant solution proposed was to treat its wastewater with cluster septic tanks (CST) combined with an Up Flow Anaerobic filter (UPAF). The project was meant to serve 1,050 HHs of two blocks. This scheme is already implemented for 322 HHs of Block A and being planned for the remaining 406 HHs of Block A and all 652 HHs of Block C. The actual cost of implementation for 322 HHs was INR 40 lakhs, whereas the estimated cost of construction for C block & balance A blocks is INR 145 lakh and INR 100 lakh respectively.


**Technology and Processes**

Conventionally, HH wastewater is transported through an underground drainage network and treated in a centralized wastewater treatment plant. This traditional model involves significant capital investment, lengthy time cycles between concept and commissioning, inconvenience to the public, and what is increasingly being seen as poor completion and efficiency rates.

In contrast, the proposed system – a simplified sewerage network with treatment in cluster septic tanks has these advantages:

- Since the length of the network is limited, the excavation for pipeline laying is also limited to a shallow depth.
- Can be laid at a flatter gradient than conventional sewers
- Lower capital and operating costs than conventional sewers
- Can be extended as a community grows

The core treatment philosophy of the proposed project is to provide preliminary treatment before discharge into drains. This consists of:

- Cluster septic tanks for reduction of solids and Biochemical Oxygen Demand (BOD)
- Up Flow Anaerobic Filters (media used will be gravel) for up to 90% removal of BOD and

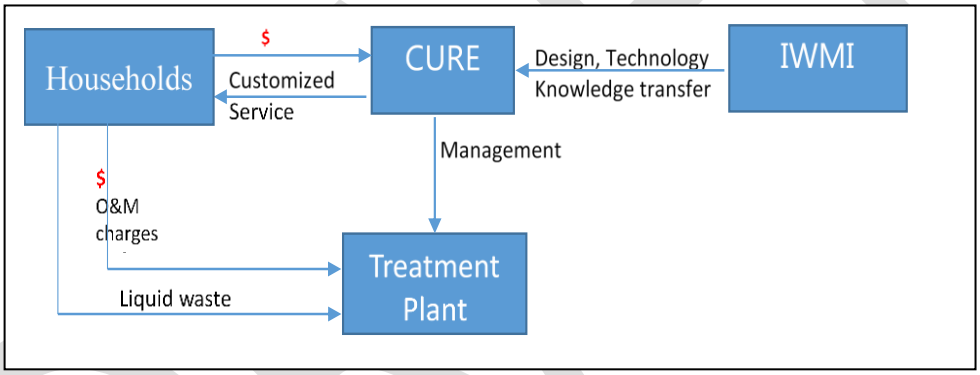
suspended solids.

The proposed system's advantages are:

- No electricity needed
- Low operating costs
- Long service life
- High reduction of BOD and solids
- Sludge production is low and stabilized
- Moderate space requirement (can be built underground)

**Value Chain and Business Model**

Based on field studies and investigations, IWMI has designed this simplified sewer system for transport of wastewater and Cluster Septic Tanks (CST) followed by treatment with UPAF. CURE is the implementing partner executing the project. After project commissioning, CURE with help from RWA, will carry out operation and maintenance (O&M) of the treatment plant and the sewer system. The households will pay a nominal monthly fee as O&M charges.




**A Specific Challenge**

Since wastewater discharge from the colony is less than 50 LPCD, it does not move fast enough to prevent settling of solid particles in the pipelines. One potential solution to such settling is regular pipeline flushing.

**Schematic Diagram / Process Flow Diagram**

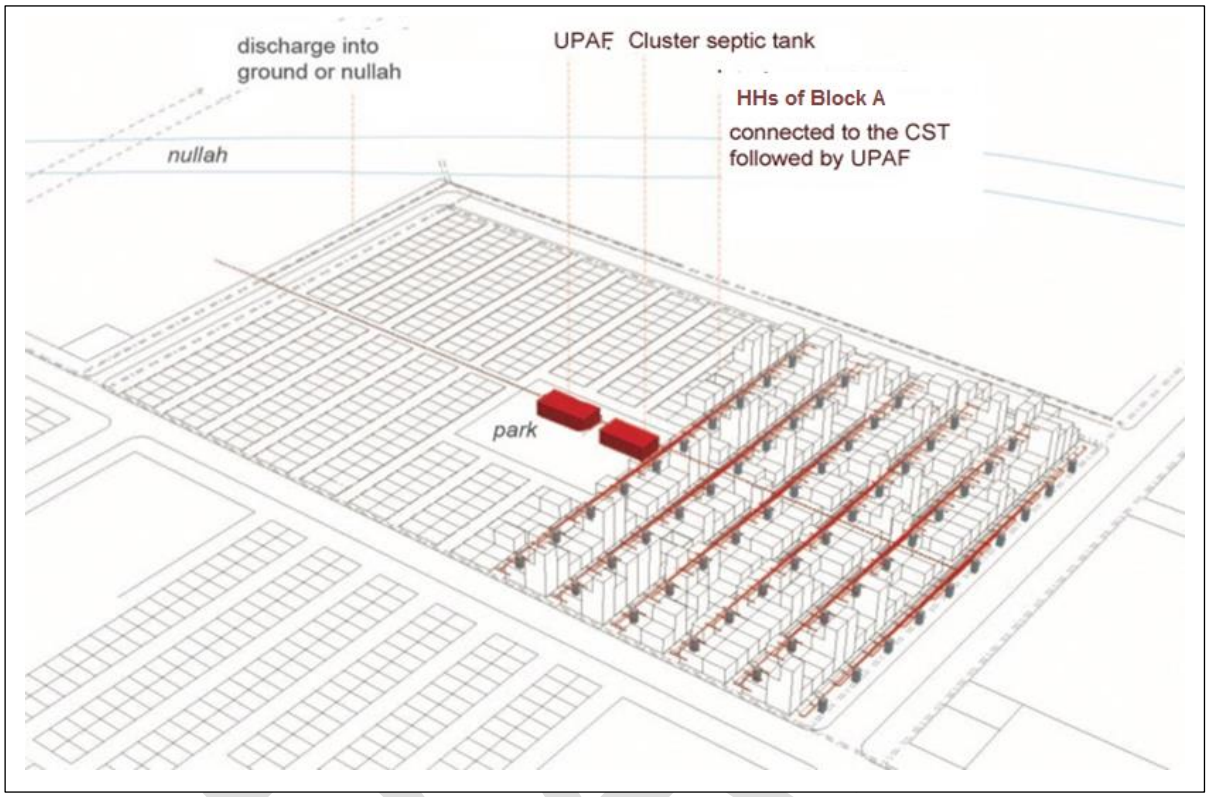
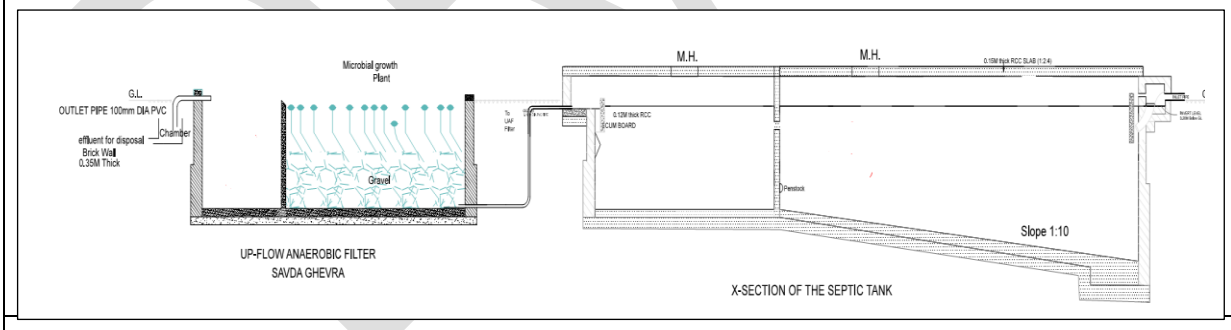



Diagram showing sewer network connected to treatment units (For 322 HHs of A block)




Schematic diagram of treatment units (Executed for 322 HHs of A block)

**Key Words**

CST (Cluster Septic Tank), UPAF (Up Flow Anaerobic Filter), Waste Water, Grey Water, RWA (Resident Welfare Association), LPCD, BOD

| Key Indicators | |
|---|---|
| Waste quantity managed, $m^3$/day | 400 |
| Land requirement, Sq.m. | 800 |
| Capital cost, $ | 450000 |
| Annual O & M cost, $ | 750 |
| Energy consumption, KWH / KL / Yr | 15 |
| Output | Sustainable grey water management solution for Savda Ghevra in Delhi. |
| Potential social and/or enviornmental impact: | Improved environment and health for residents from improved grey water management; improved living conditions of residents due to planned de-sludging. |