IT enabled online monitoring systems for scheduled septic tank desludging in Maharashtra, India

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**Demand Desludging v/s Scheduled Desludging**

- **Demand Desludging**
  - Desludging is done on-call basis
  - Desludging frequency – 8-10 Years
  - Desludging services treated as a complaint redressal system
  - Not all HHs receive services and often pay very high charges
  - Low frequency of desludging leads to increase pollutant load
  - Difficult to monitor private informal providers.

- **Scheduled Desludging**
  - Septic tanks desludged once in three years on scheduled basis
  - Service provision + regulations to ensure scheduled desludging
  - Equitable and affordable: Citywide coverage and levied sanitation tax
  - Likely reduction in pollutant loads and coliform in septic tank effluent
  - Regulated and monitored by ULB through service contract
Wai & Sinnar: 1st cities to implement scheduled desludging services in India

• Wai & Sinnar – Located near Mumbai
  • Population - Sinnar ~70,000
    Wai ~40,000

• Pioneer Indian cities in FSM
  • 1st city - Performance linked annuity model for scheduled desludging in India
  • 1st city - Levying a sanitation tax for FSM
  • 1st city (Sinnar) - Setting up FSTP on DBO model
    (Fully funded by local government)
SaniTab

- Android-based tool for sanitation survey
- Citywide digital data collection tool
- Capture household / property level data
- Creating onsite sanitation database
Performance linked annuity model for scheduled desludging...

Scheduled septic tank desludging services started from June, 2018
# Performance linked Monitoring

**Mechanism of desludging service**

## Existing paper based monitoring system to Online Monitoring System

<table>
<thead>
<tr>
<th>LG’s copy</th>
<th>Property holder’s copy</th>
<th>Treatment plant’s copy</th>
<th>Private operator’s copy</th>
</tr>
</thead>
</table>

### Collection and transport record form

<table>
<thead>
<tr>
<th>Serial No: ________</th>
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</table>

#### i. Details of Waste Generator

- a) Name: ___________________________
- b) Phone Number: ___________________
- c) Address: _________________________
- d) Property Tax Number: _____________
- e) Type of building: Individual house / Apartment / Commercial complex / Other (specify)
- f) Was the Septic tank cover open (Yes / No)

#### ii. Identification of Waste:

- a) Volume ________ liters
- b) Type: ____________ Septic Tank _________ Others
- c) Source: Residential/Commercial/Restaurant/Others
- d) Septic tank cover placed back on Septic tank: Yes / No
- e) Septic tank emptied: Yes / No
- f) Any kind of deficiencies, missing pipes or fittings, improper manholes or access covers, any other cracks or damage observed: __________________________

The undersigned being duly authorized does hereby certify to the accuracy of the source and type of Fecal Sludge and septage collected and transported.

- Date: ___________________, Time: ___________
- Name and Signature – Property owner: ________________________

#### iii. Details of Sumeet Facilities Operator

- a) Name of Driver: ___________________________
- b) Permit: ___________________________
- c) Vehicle License no: ___________________
- d) Truck Capacity: _______________________
- e) Pump Out Date: _______________________
- f) No. of trips taken to empty the septic tank: ___________________

The above described wastewater was picked up and hauled by me to the disposal facility named below and was discharged. I certify that the foregoing is true and correct:

- Name and Signature of authorized transport agent and title: ___________________________

#### iv. Acceptance by Wai Municipality’s authorized FSTP

The above transporter delivered the described Fecal sludge and Septage to this treatment facility and it was accepted.

- Details (If yes): _____________________________________________________________________________________________

- No of trips received at the FSTP for this form: ______
- Septage received at treatment plant: Date: __________, Volume: ____________ liters

Name and Signature of authorized treatment plant operator signatory and title: ___________________________

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**NOTE**: SUBJECT TO THE TERMS AND CONDITIONS OF WAI MUNICIPALITY
IT enabled systems

Online monitoring system for scheduled desludging

Scheduling
Recording desludging operations
Recording treatment operations
Dashboard
User management

Monitoring and database creation system

SaniTab app
Dashboard
Database
Module for desludging schedule

• City divided into 3 zones to be covered each year
• GIS linked property tax data - Basis for desludging scheduling / route mapping
• Prepare septic tank desludging schedule
Amazon delivery like app for desludging service operations

- Selects from ‘scheduled’ list
- Displays key property information
- Records desludging volume, status of access cover, photo of property
- Customer’s & operator’s signature – like Amazon delivery app
- Looping to collect from multiple properties in one trip or multiple trips for one property
- FSTP operator signature at disposal
- In-built validation checks

Warning! You are not at the designated site for disposal
GPS enabled live desludging vehicle tracking system

Live vehicle tracking
- Route tracking
- Speed tracking
- Odometer tracking
- Engine on-off tracking

Dashboard
- Vehicle status report
- Vehicle performance report
- Drive summary report
- Spatial view

Integrated with existing system on SWM
Module on FSTP operations

- Captures safe unloading of collected sludge
- Interface to capture daily volume treated, quality testing results
- Alerts on web dashboard if results exceed permitted water quality levels

Online real time monitoring: Treated water quality discharge (multi parameter)
Web module – Dashboard

- Login for different user types
- Dashboard to show real time progress
- Enables spatial information view
- Dashboard captures CWIS principles
Downloadable MIS Results

Payment for desluder linked to submission of the septic tank desludging report
Key Salient features

- Real time monitoring of schedule emptying service performance
- Online signature – like Amazon delivery app
- Real time stamping – start and end of operation
- Photo stamping – Capture property/ septic tank details
- Ensure safe disposal at FSTP through multiple checks
  - Online – Real time water quality monitoring
  - Installation of RFID tag @ trucks and @ FSTP
  - Real time truck running monitoring (GPS enabled trucks)
  - In-build validation checks in mobile application
Key Benefits - Program efficiency for FSM services

Integrated monitoring system – Across FSM service chain

“Real time” monitoring
No need to process data for results

Easy to Operate,
Reduce paper work,
Minimize human error

Can view progress easily and process payments

Citizen awareness about emptying procedures

Inclusive – supports vernacular language
Partnerships and Collaboration

Bill & Melinda Gates Foundation
Government of Maharashtra
HSBC
W.M.C
All India Institute of Local Self-Government
Sumet Facilities
CWAS Center for Water and Sanitation
CEPT University
Transerve
Points to remember….

- A simple, user friendly integrated online FSM monitoring system
- Robust and integrated MIS/ Dashboard to track the real time progress
- Payment to be linked to online monitoring system (with multiple checks)
- SaniTab – Database creation of onsite sanitation for 85,000+ properties
- User guides and training modules are available for use of SaniTab tool
Thank you

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About us
The Center for Water and Sanitation (C-WAS) at CEPT University carries out various activities – action research, training, advocacy to enable state and local governments to improve delivery of services.