

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

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Demand Desludging

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

v/s

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

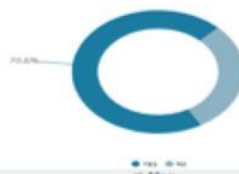
- Android-based tool for sanitation survey
- Citywide digital data collection tool
- Capture household / property level data
- Creating onsite sanitation database



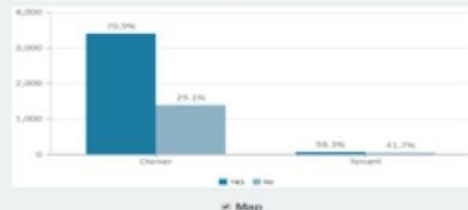
Wai Municipal Council: Baseline Sanitation System Assessment



Households having latrine facility within premises

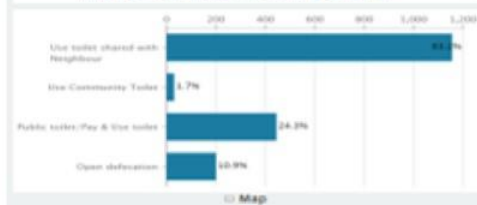


% having latrine facility within premise

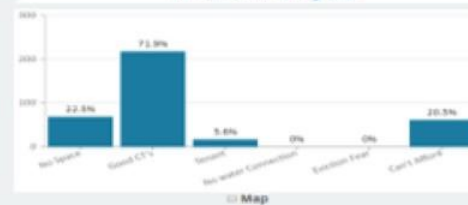


Households without toilets

where do Households without toilet defecate?



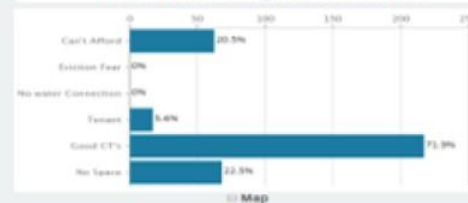
Reason for not having toilet



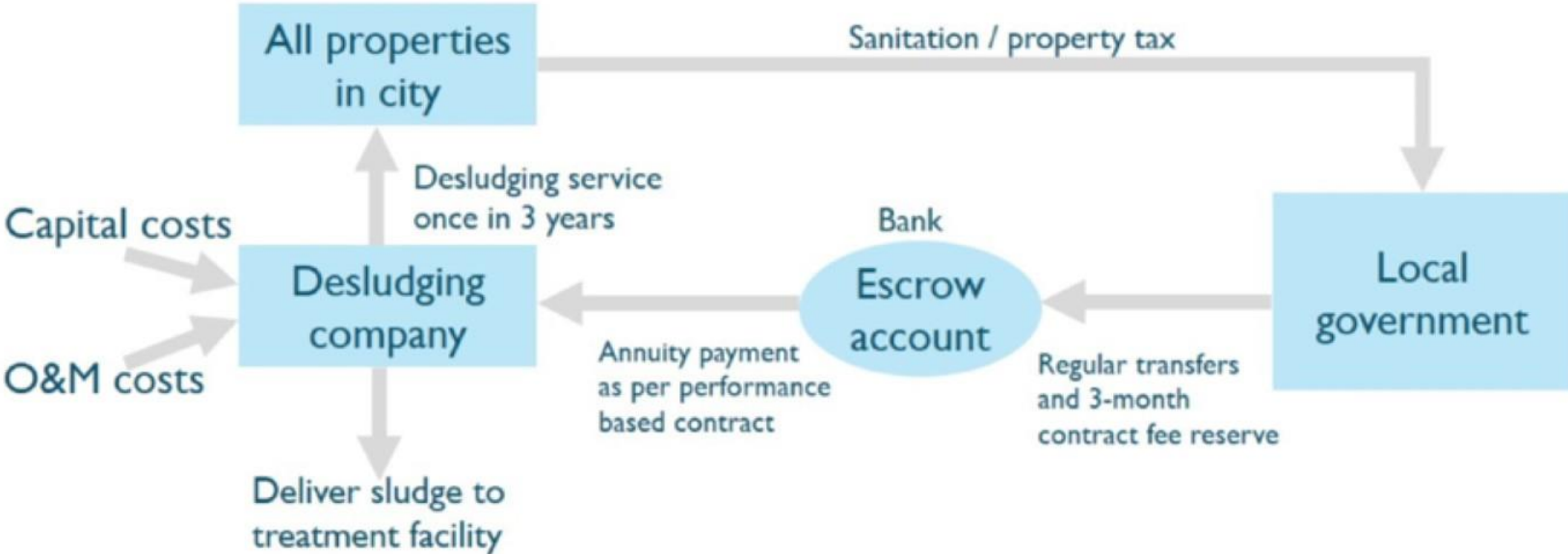
Households willing to construct toilet



Reason for lack of willingness to construct toilet



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

LG's copy

Property holder's copy

Treatment plant's copy

Private operator's copy

Serial No: _____

Collection and transport record form

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/Other
- 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, im proper 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 Faecal Sludge and septage collected and transported.

Date: _____, Time: _____, Name and Signature – Property owner: _____

III) Details of Septic Tank Operator

- a) Name of Driver :
- b) Firm it :
- 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 PSTP

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

The waste was contaminated with solid waste or other kinds of waste: YES / No

Details (if any): _____

No of trips received at the PSTP for this form: _____

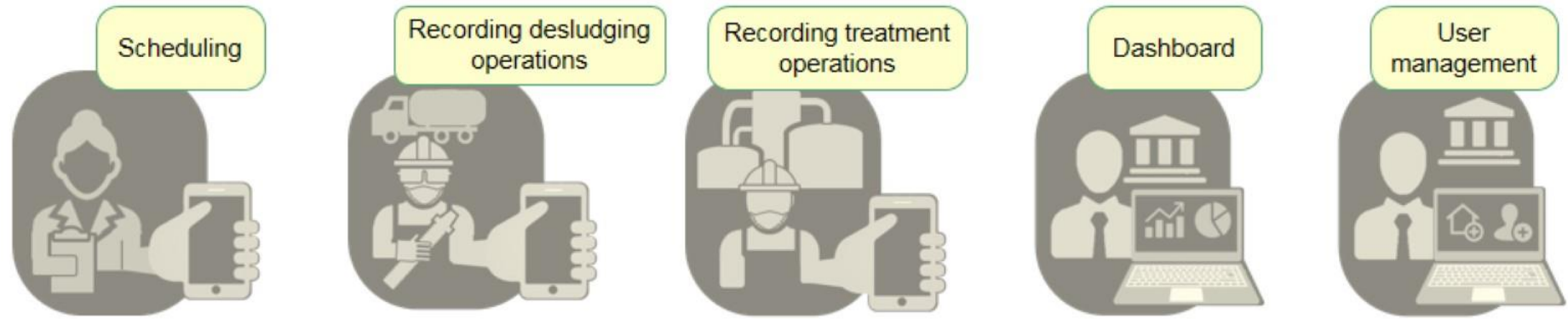
Septage received at treatment plant: Date: _____, Time: _____, Volume: _____ liters

Name and Signature of authorized treatment plant operator (signature) and title: _____

NOTE: SUBJECT TO THE TERMS AND CONDITIONS OF WAI MUNICIPALITY

IT enabled systems

Online monitoring system for scheduled desludging

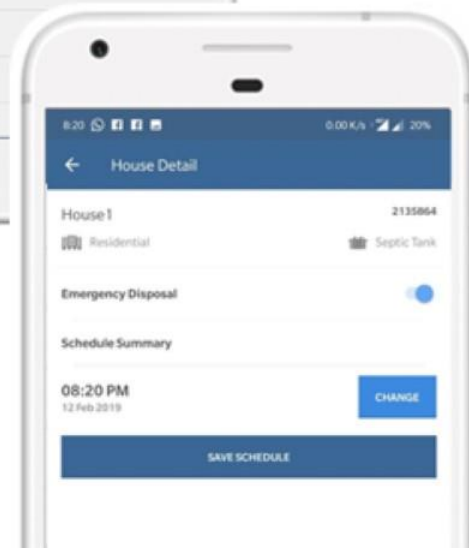
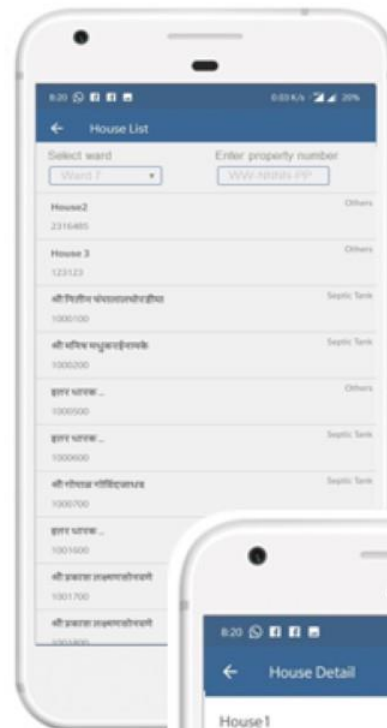
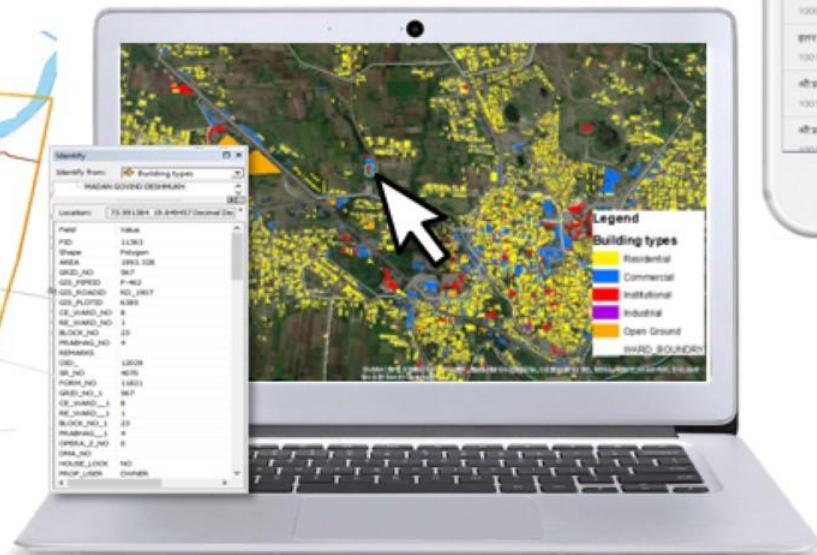
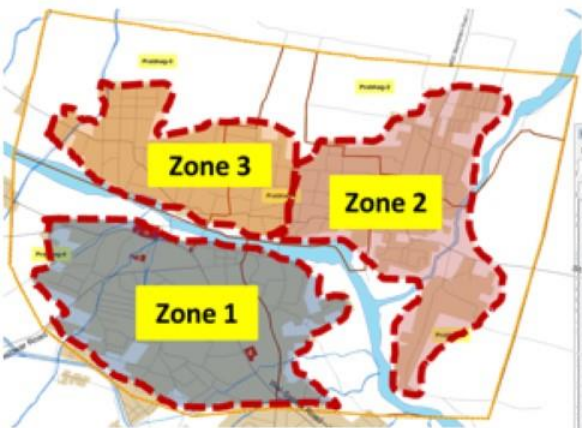


Monitoring and database creation system



Module for desludging schedule

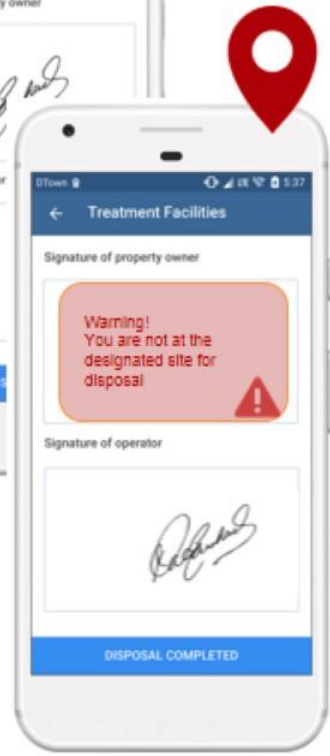
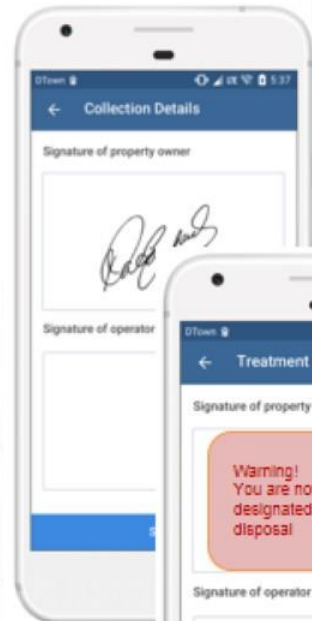
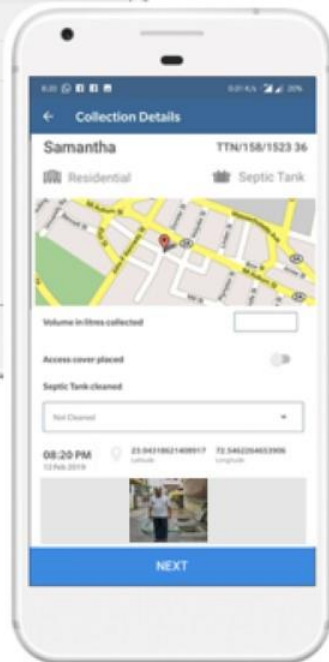
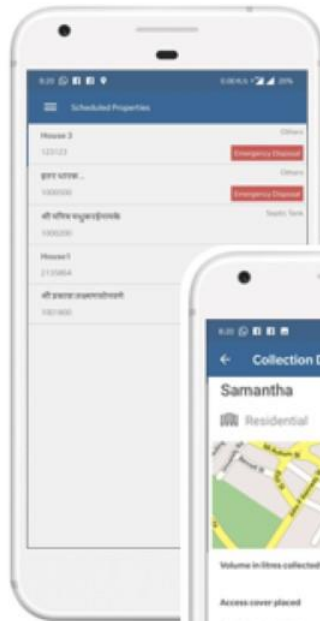
- City divided into 3 zones to be covered each year
- GIS linked property tax data - Basis for desludging scheduling / route mapping
- Prepare septic tank desludging schedule



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



GPS enabled live desludging vehicle tracking system

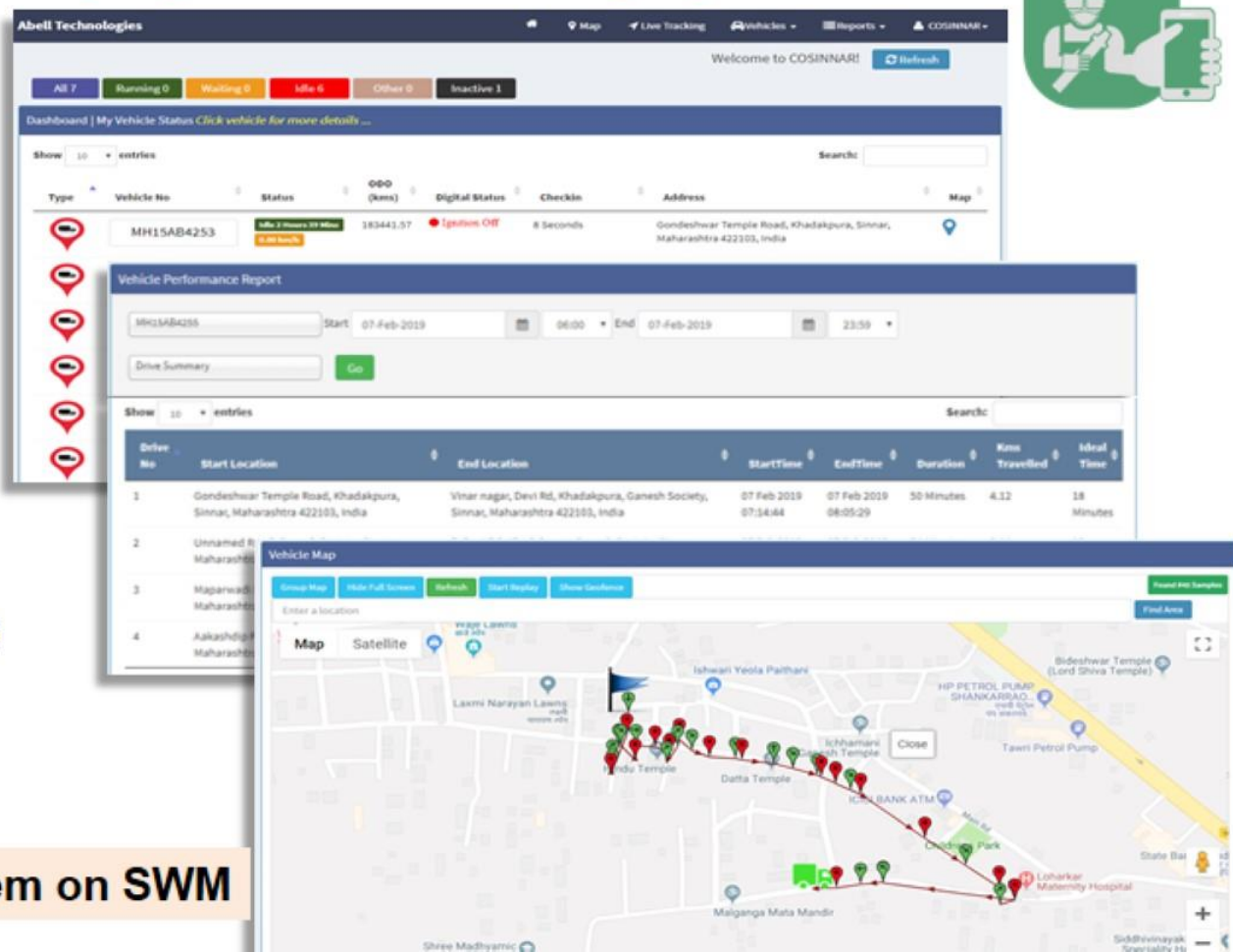


Live vehicle tracking

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

Dashboard

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

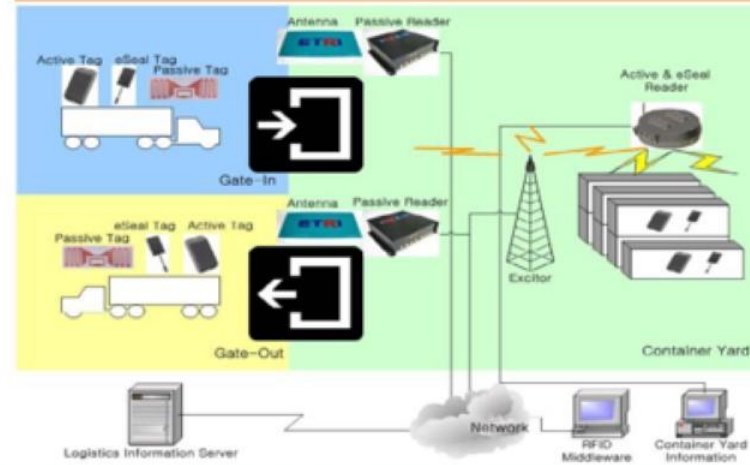


Integrated with existing system on SWM

Module on FSTP operations

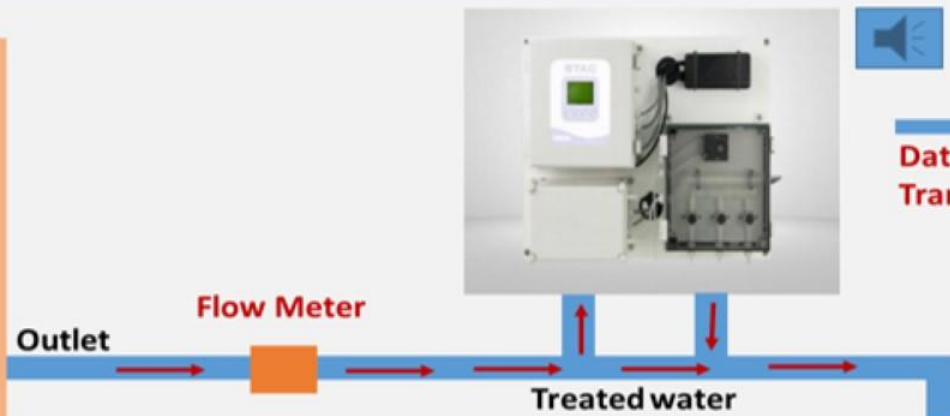
- Captures safe unloading of collected sludge
- Interface to capture daily volume treated, quality testing results
- Alerts on web dashboard if results exceed permitted water quality levels

Radio-Frequency Identification (RFID) System @ FSTP



Online real time monitoring: Treated water quality discharge (multi parameter)

FSTP



Data Transfer

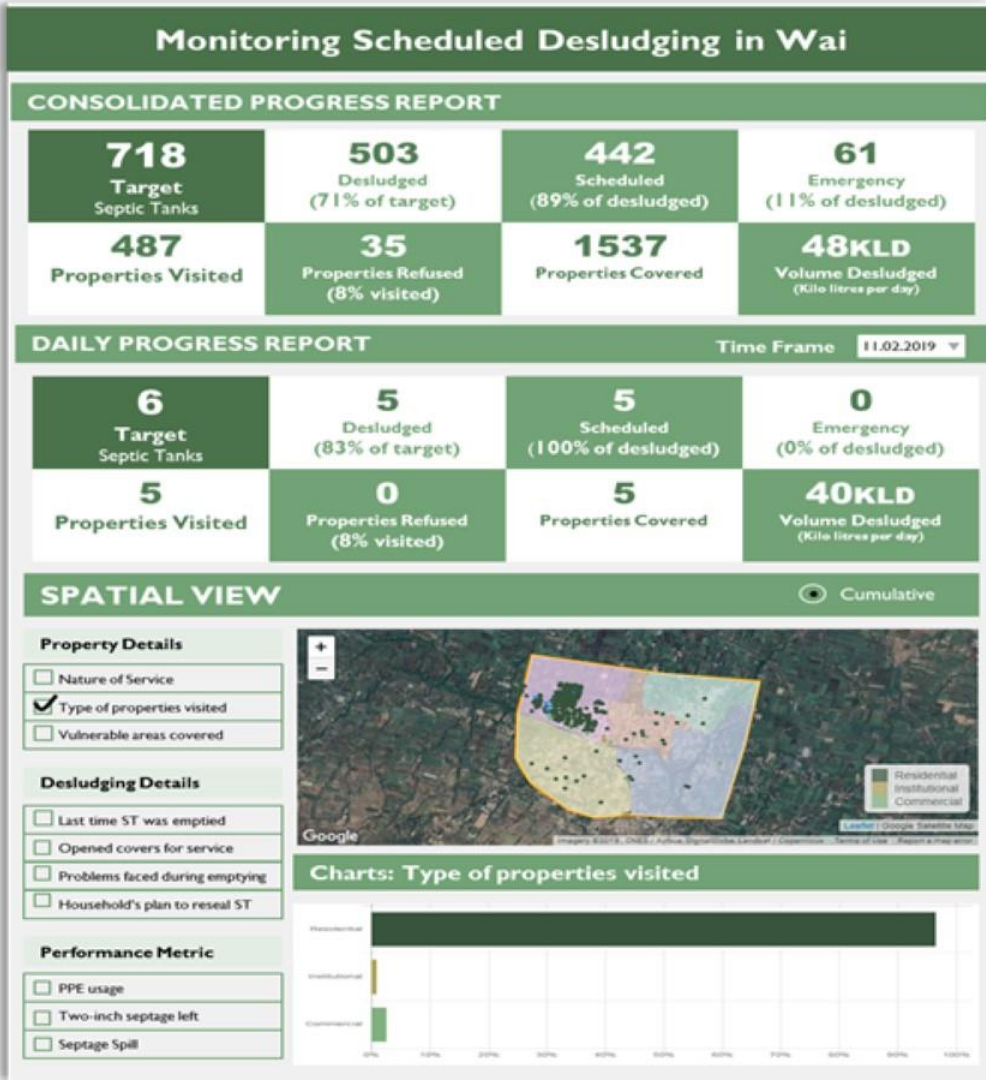
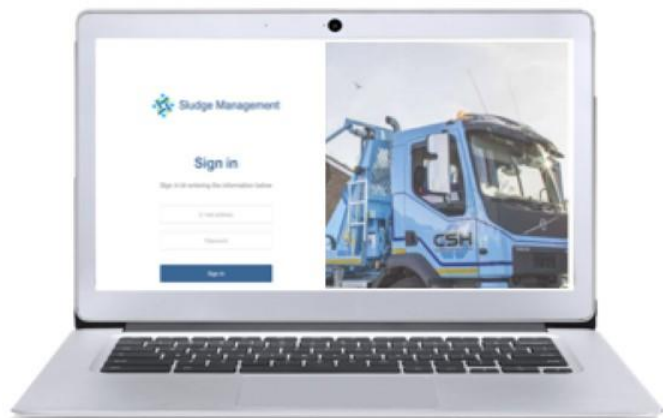


Client data viewer



Web module – Dashboard

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

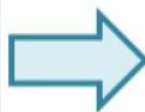


Downloadable MIS Results

Download: Reports, Database and Media files

ID	Date	Coordinates	Property ID	Property Name	Status
417	2019-02-08	50.33.13.003 13.52.52.517	358410090162955	वसुंधरा अपार्टमेंट	empt
418	2019-02-08	13.18.39.99 14.09.21.172	358410090162955	वसुंधरा	empt
419	2019-02-08	18.38.54.905 17.45.23.567	358410090162955	वसुंधरा अपार्टमेंट	empt
423	2019-02-09	17.18.45.933 17.50.19.161	358410090162955	वसुंधरा अपार्टमेंट	empt
424	2019-02-11	11.46.07.363 17.50.06.525	358410090162955	वसुंधरा अपार्टमेंट	empt
425	2019-02-11	13.50.48.469 10.38.31.202	368865033580421	वसुंधरा अपार्टमेंट	empt
453	2019-02-11	17.18.05.758 10.38.21.783	368865033580421	वसुंधरा अपार्टमेंट	empt
427	2019-02-12	15.15.45.457 16.09.43.429	358410090162955	वसुंधरा अपार्टमेंट	empt

Payment for deslugger linked to submission of the septic tank desludging report



Septic Tank Desludging Report



Scheduled Emptying of Septic Tanks

Collection and transport record

Activity no: 14/02/19/01



Property details

 Prop no: 07-1432-00
 Type: Residential - Apartment
 Address: समर्थ अवर, मासिक पुन रोज, सिव्हर - 422103
 Owner: श्री सिटीज पंपासलरसेण्ट्रीज
 Phone no: 9873456234
 Type of system: Septic tank



Emptier details

 Truck ID: Sumit truck #1
 Driver: Raju Lal
 Vehicle license no: 434/13/12345
 Truck capacity: 3000 L

Service details

 Access cover open on arrival ✓
 Volume collected: 4560 L ✓
 Access cover replaced after emptying ✓
 Emptier use proper safety gear ✓
 Number of trips taken to empty: 2

Emptying Date: 14/02/2019

Emptying Time: 14:20

Property owner



Emptier



Acceptance at treatment site and safe disposal

 FSTP name: Sinnar FSTP and resource center
 Disposal Date: 14/02/2019
 Disposal Time: 14:50
 FSTP operator:



Emptier



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

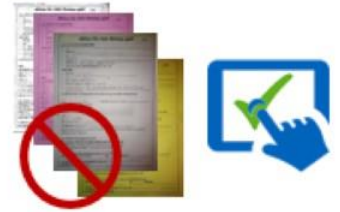
Integrated monitoring system – Across FSM service chain



“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



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

An aerial photograph of a two-lane asphalt road winding through a green, rural landscape. In the foreground, a yellow water truck is driving towards the viewer. Further down the road, a red and white bus is driving away. Several motorcycles are also visible on the road. The background shows a small settlement with houses and trees under a cloudy sky.

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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.

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