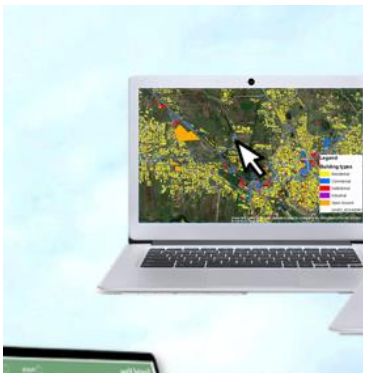

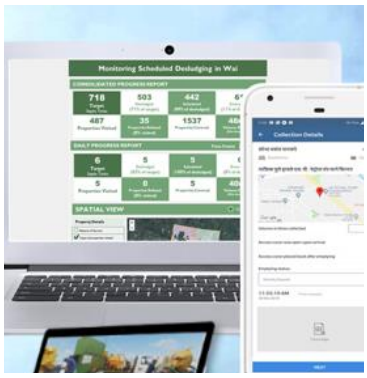

IT enabled monitoring systems for monitoring FSSM

SaniTab and SaniTrack

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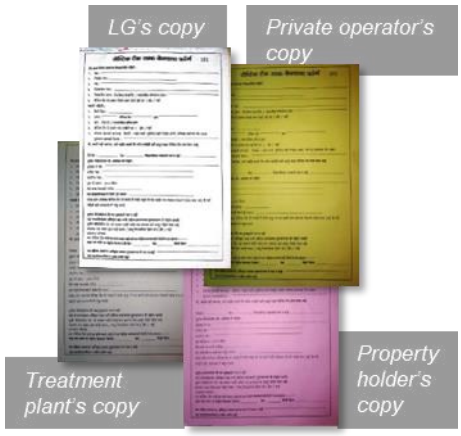
IT enabled monitoring systems for monitoring FSSM

1.1. Need for monitoring systems for sanitation service delivery

The cities of Wai and Sinnar in Maharashtra, which are dependent on onsite sanitation systems like septic tanks, are successfully implementing citywide faecal sludge and septage management plan for safe collection, conveyance and treatment / disposal of faecal matter. The city governments have entered into contracts with a private service provider who will be responsible for carrying out scheduled emptying of septic tanks. In addition, faecal sludge treatment plants have also been set up for safe disposal of collected septage. These are also being managed by a private agency. With all this institutional machinery in place, the cities need monitoring mechanisms for tracking the provision of these sanitation services.

The existing contracts with the private sector include clauses for performance-based payments which ensures that service is up to standards. For monitoring this, first a paper based system was set up where each successful desludging required signatures from receiving household and FSTP operator on a form. Four copies of this receipt are made – one for each household, desludging company, municipality and FSTP operator. These forms are proof of service delivery with adherence to standards, and the private desludger is paid accordingly by the municipality.



Next, to make the process smoother and more transparent, a gamut of IT enabled monitoring systems have been introduced across the sanitation value chain by the city governments and CWAS-CRDF-CEPT University. The forms and signatures are collected on mobile apps and data is collated automatically on online dashboards. These systems, called SaniTrack and

SaniTab are meant to reduce paperwork and human error. They also provide insights on the desludging service such as geo-spatial spread, coverage of properties, customer satisfaction, volumes and trips, coverage of vulnerable areas etc.

1.2. SaniTab

Components

SaniTab consists of an Android app where forms can be deployed. Surveyors enter relevant forms , enter data into the form and submit it to generate a database. The forms are fully customisable through the admin panel where any type of questionnaire can be easily coded and submitted and vernacular languages are also supported. In Wai and Sinnar, the forms are also available in Marathi.

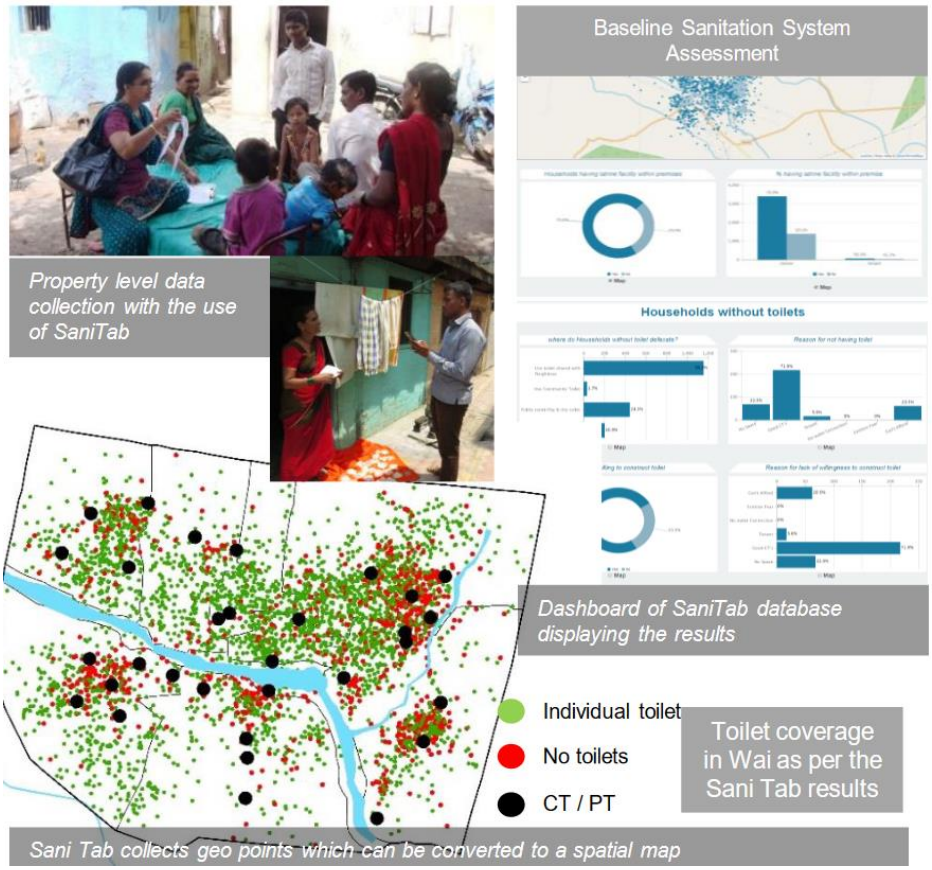
The App is also fast and lightweight. Multiple numbers of surveyors can concurrently use the app with ease. The app is coupled with a server to submit data collected on the field by multiple surveyors. In addition to text-based questions, the application also allows capture of photos and GPS coordinates for quick and easy spatial mapping. Capturing spatial details makes it possible to identify and focus more on the vulnerable areas. The data collected is plugged into a dashboard allowing quick analysis.

Using the data submitted to the server, online dashboards are developed which provide real-time updates for the city administration to have quick analysis of the survey results, and for exploring various relations.

Originally developed as a survey tool

The assessment of a city's sanitation scenario is the first key step for city sanitation planning. ***SaniTab***, a smartphone/tablet-based survey tool was originally developed in 2015 as a data collection/survey tool with the objective of helping cities assess their sanitation scenario while collecting the required information through household surveys and building a city level database. In Wai, SaniTab was used to capture details such as – i) Households resorting to open defection, ii) access to toilets, iii) type of sanitation systems iv)willingness to construct toilets and ,v)PPE usage.

In Sinnar, it was also used to assess household willingness to apply for toilet loans.



SaniTab as a monitoring tool

A detailed database of onsite systems is a useful input for making informed decisions in sanitation planning and future service provision. However, this type of database is very rare and requires considerable resources to build. With the introduction of scheduled desludging in both cities, every property was to be visited over the course of a three year emptying

cycle. This presented an opportunity for building a unique and detailed database of onsite systems in the cities. A SaniTab form was deployed along with regular monitoring for desludging and a dashboard was developed for city administrators. The data collected includes data points on characteristics of onsite systems such as the technology, the number of properties its serves, shapes and sizes, truck accessibility etc.

Data aspects captured for monitoring the desludging services –

Property- level data	**Performance of desludger**	**On-site sanitation system database**
• Location details such as ward no., locality name, property no, GPS location for easy identification, • Type of property – residential, commercial, institutional or mixed • Readiness of property to receive service and reason for refusal in case not ready to receive service • Ownership of Property – Owner or Tenant? • Is the property located in a vulnerable area? – to confirm coverage	• Volume desludged in lts. • No. of emptying trips made per property • Use of protective gears • Problems faced during emptying • Occurrence of any septage spill • Was 2-inch septage left during service	• Type of Disposal System • Is it a shared system? If yes then how many properties share? • Size & location of disposal system • Shape of disposal system • Ease of accessibility from road • Type of access cover • Last time the septic tank was emptied

1

Households informed about the visit a day earlier. Expected to open covers of their septic tanks at the time of visit.

2

Properties visited as per the route plan.

3

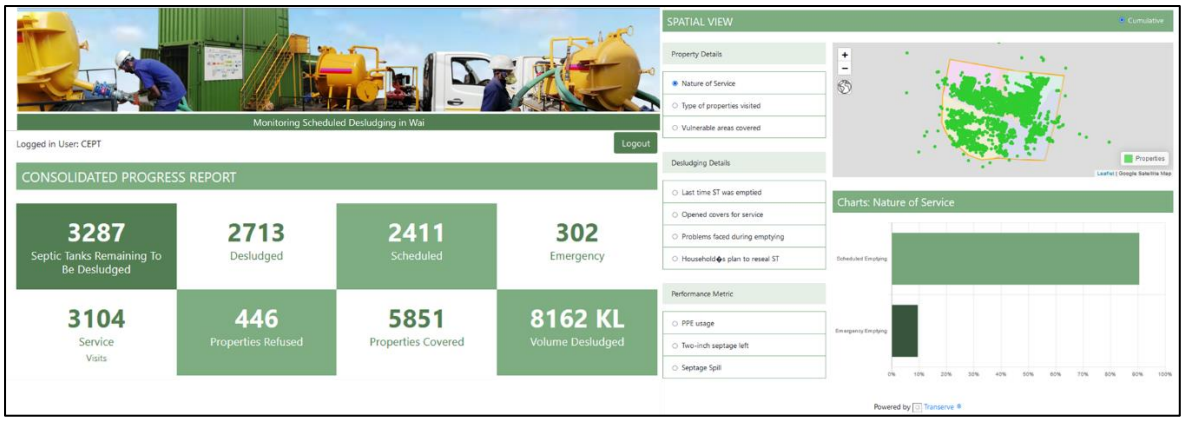
The surveyors accompany the desludger to the properties where the SaniTab form is filled out in consultation with the property owner.

4

On completion, the form is saved and submitted. Once submitted, the data gets reflected on the dashboard.

Some of the parameters closely monitored using Sanitab are :-

1. Daily, monthly and cumulative target monitoring
2. Coverage of all properties inclusive of vulnerable areas
3. Problems faced during the emptying operations
4. Performance of the private service provider
5. Usage of PPE by the private service provider
6. Households readiness to receive emptying service need for awareness

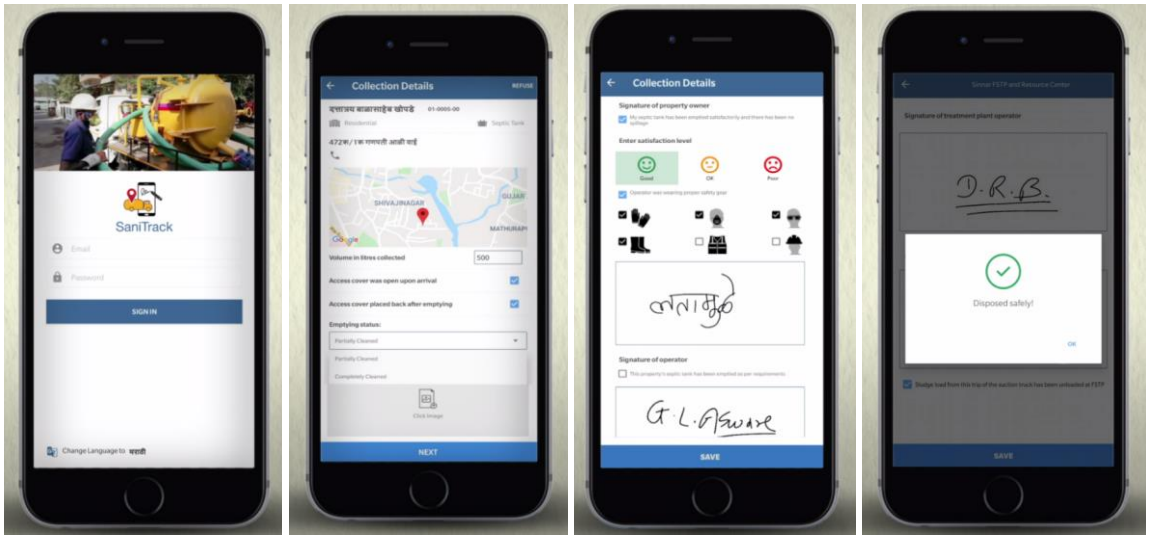


1.3. SaniTrack

Digitizing the paper forms and customer acknowledgements system

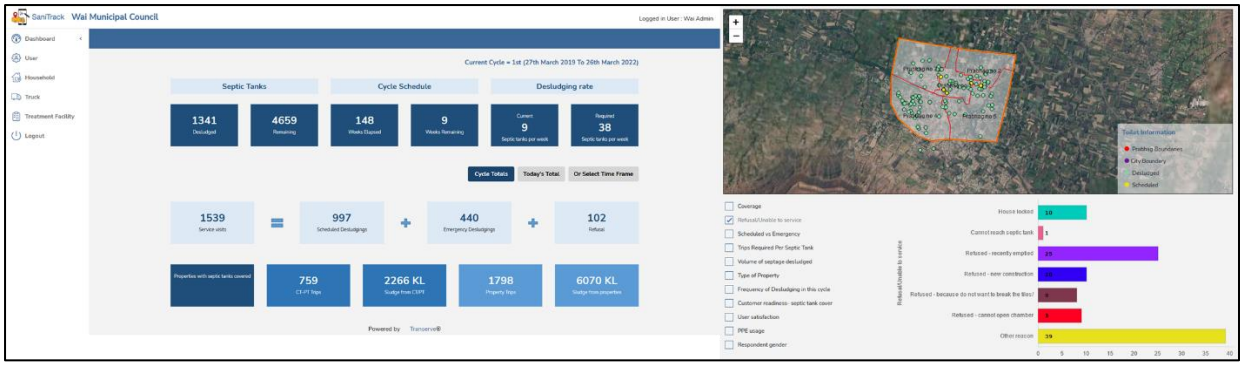
In order to monitor end to end desludging operations and provide a much simpler way to record daily operations, SaniTrack was developed an online, GIS enabled monitoring system. ***SaniTrack*** consists of app and web modules, where the desludger can schedule and record daily operations with on-screen signatures like an e-commerce app. City mangers are also provided with web dashboards which show real-time information on geographical coverage, household readiness, safe conveyance etc. It is designed to digitize the paper based forms and receipts system with simple touch and select options in order to minimize human error and manual calculations as far as possible.

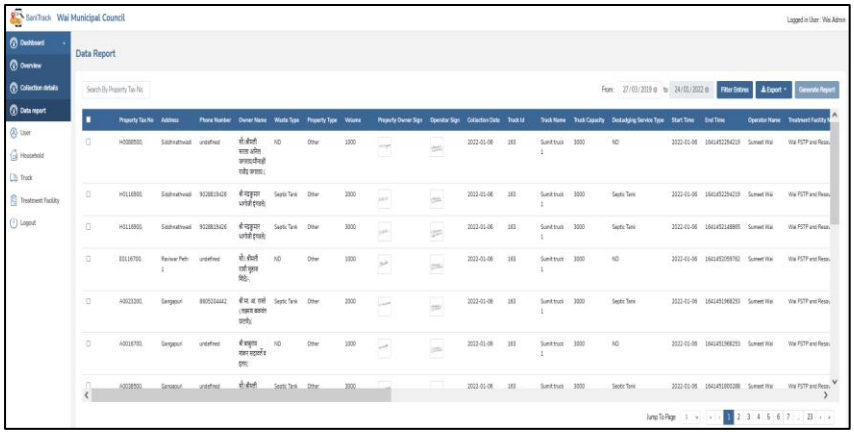
SaniTrack can accommodate various models of FSSM – scheduled or demand-based, service provided by government or the private sector, and single or multiple service providers.

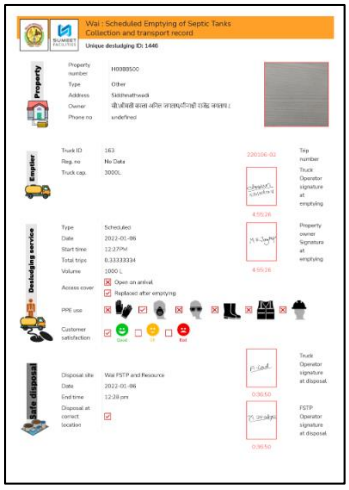


Components

SaniTrack consists of a mobile app-based modules for desludging operators for day-to-day scheduling and then recording details of each desludging with acknowledgement by household respondent through signature on the mobile app. Along with signatures, geo-location & timestamp is captured automatically and the operator will also be able to collect data about type of property, sludge volume, household details, ward etc. It also captures the safe unloading of collected septage at the FSTP through similar acknowledgement. A centralized web portal also allows registration of new households, desludging service operators/contractors, ULB's treatment facilities. This MIS then displays the information on a web map as well as allows the administrator to download the information in pre-configured formats. An overview screen provides information on coverage and key performance indicators such as coverage of properties and volume of sludge. A second screen gives spatial views on a map with filters and charts for more detailed indicators such as coverage of properties from slums and low income areas, customer readiness, acceptance rate for services, trips, PPE usage, respondent gender etc. Each property can be selected to see the signatures and photographs and downloadable results are available in the form of spreadsheets and individual graphical reports.







Data being collected

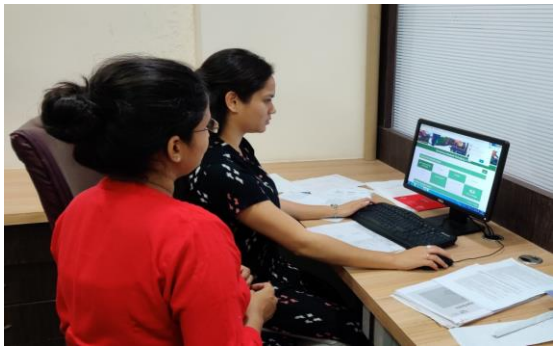
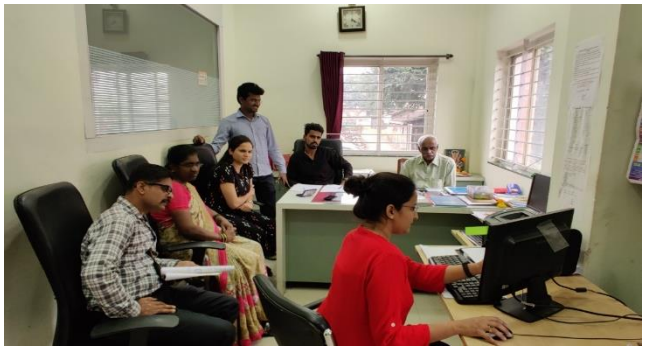
Pre-uploaded database	Property desludging data	CT/PT desludging data

•Property Tax number WARD:NUMBER:PART
•Owner name and phone number
•Address
•GPS location
	• Emergency or Scheduled
	• Unique Desludging ID
	• Service refusal
	• Time stamps and dates
	  ○ Scheduled
	  ○ Desludging started
		• Name of CT/PT
		• Unique Desludging ID
		• Time stamps and dates
		  ○ Desludging started
		  ○ Desludging ended
		  ○ Delivery at FSTP

•Type of property •Type of sanitation system •Is it a shared system? •Prop. no of sharers	○ Desludging ended ○ Delivery at FSTP • Respondent gender • Status of access cover • Volume collected • PPE usage • Trips taken • Signatures ○ Property owner at collection ○ Operator at collection ○ Operator at delivery to FSTP ○ FSTP operator at delivery • Photo at collection • User Satisfaction level • Desludged by which truck • If near FSTP at delivery • Delivered to which Treatment Facility	• Volume collected • PPE usage • Trips taken • Signatures ○ Operator at collection ○ Operator at delivery to FSTP ○ FSTP operator at delivery • Photo at collection • Desludged by which truck • If near FSTP at delivery • Delivered to which Treatment Facility

1.4. Usage in WMC, SMC and key benefits

Wai Municipal Council and Sinnar Municipal Council has been using these apps for monitoring sanitation services under SBM and Swachh Sarvekshan. The apps have been useful in increasing program efficiency for service operations. Integrated monitoring systems provide collated information across the FSSM service chain. Real time data provides quick results on dashboards and there is no need to manually process paper based forms to evaluate and disburse payments to the private operator. The digital apps are easy to operate and significantly reduce paper work as well as minimize human error. Training for truck operators and supervisors have been conducted and city administrators are regularly using the dashboard to monitor progress. Photo stamping and geo-stamping provide an added degree of authenticity to the data collected and allow monitoring at city scale. It is now easy to see coverage in the city. Lastly, the unique and detailed database of sanitation systems is seen to be very useful for future planning of operations.

Training and usage by Council officials


Training and usage by sanitation staff and private operator

CENTER FOR WATER AND SANITATION

The Center for Water and Sanitation (CWAS) is a part of CEPT Research and Development Foundation (CRDF) at CEPT University. CWAS undertakes action-research, implementation support, capacity building and advocacy in the field of urban water and sanitation. Acting as a thought catalyst and facilitator, CWAS works closely with all levels of governments - national, state and local to support them in delivering water and sanitation services in an efficient, effective and equitable manner.

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