SaniTab as a monitoring tool

December 2020

Contents

Sanitation tools for city-wide sanitation service assessment and monitoring

CWAS has developed a number of tools for **sanitation service assessment, improvement and monitoring** aimed at a range of users – urban local bodies, research organizations, private partners in the sanitation sector and development corporations.

Assessment of a city's sanitation scenario is the first key step for city sanitation planning. Equally important is the monitoring of the sanitation services a local government provides its residents.

Some of the tools developed by CWAS for sanitation service assessment and monitoring are –SaniTab, SaniTrack and Sani-Q

An android-based app, SaniTab, was initially developed for sanitation surveys at the household level.

SaniTab can be used for generating baseline information for planning and monitoring ODF and FSM activities in cities.
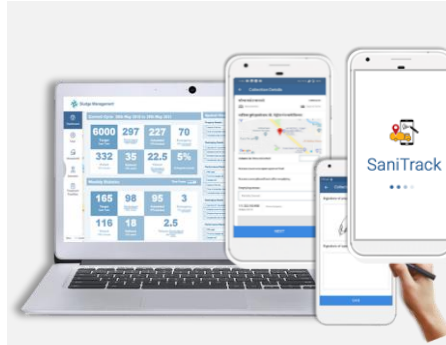
SaniTrack is an app for desludging operations carried out in cities.

This tool ensures safe disposal of sludge at FSTP and captures customer's signatures while monitoring the service levels provided.

Owing to this tool's customizable nature, SaniTab is now also being used for monitoring the desludging operations being carried in two cities in India.

This tool allows for quick analysis of data and can be easily made available in vernacular languages.
This two series slide-deck focusses on the tool **SaniTab**.

SANI-Q

Sani-Q enables online, real-time water quality monitoring at FSTPs in two cities in India.

This tool captures the daily volume treated and the quality testing results.

SaniTab

SANITAB, a mobile application on Android, is eminently customizable, easy to administer, and provides quick analyses of surveyed data. The objective of this application is to help cities assess its sanitation situation, while collecting the required information through household surveys and building a city level database. Based on this, cities can make appropriate sanitation improvement plans for their respective cities or monitor the progress of existing sanitation service delivery. The city could use the data collected using SaniTab to establish an MIS and use it to monitor the progress of the improvement schemes.

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.

The server also provides an online dashboard for the city administration to have quick analysis of the survey results, and for exploring various relations.

This App is easy to replicate across cities and can be customized to meet various sanitation objectives. The App is also fast and lightweight. Multiple numbers of surveyors can concurrently use the app with ease.

SaniTab has been used widely in India and has received international recognition as well. The simplicity of the app makes it appealing to a wide range of users, such as – urban local bodies, private sector, consultancy firms and research organizations.

"Real time" monitoring No need to process data for results

Easy to Operate, Reduce paperwork, Minimize human error
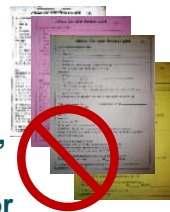
Integrated monitoring system – Across FSM service chain

Inclusive – supports vernacular language

Can view progress easily and process payments

Origins of SaniTab and its applications

Sani Tab was 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.

The data is collected by means of a Sani Tab survey form. A surveyor enters data into the form and submits it to generate a database. Based on this database, ULBs can make appropriate sanitation improvement plans for their respective cities.
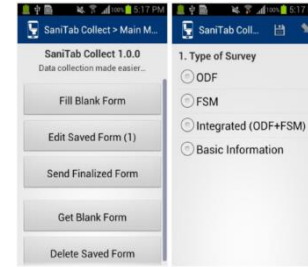
The App also enables easily customizable survey forms and provides quick analysis of the surveyed data.

Based on the purpose of the data collection exercise, the App by default incorporates four different questionnaires:- Open Defecation Free (ODF), Fecal Sludge Management (FSM), Integrated (ODF + FSM) and Basic Information.

Besides building a city-level sanitation database, Sani Tab has been used for assessing household's willingness to apply for toilet loans, monitoring scheduled desludging operations, monitoring PPE usage by sanitation workers and so on.

The App also supports vernacular languages making it easy to use at any given city or country. So far Sani Tab has been deployed in Marathi, Oriya and Vietnamese.

In 2018, Sani Tab evolved into a **monitoring tool**. Now the App does not only capture data but also **enables monitoring of the sanitation scenario** in cities.

Four Types of questionnaire available			
Open Defecation Free	Integrated ODF-FSM	Fecal Sludge Management	Basic Information

Toilet availability , OD and CT dependency

Toilet connectivity

Willingness to build own/shared toilets

Financial capability

Septic tank details

Information about emptying and cleaning

Number of septic tanks
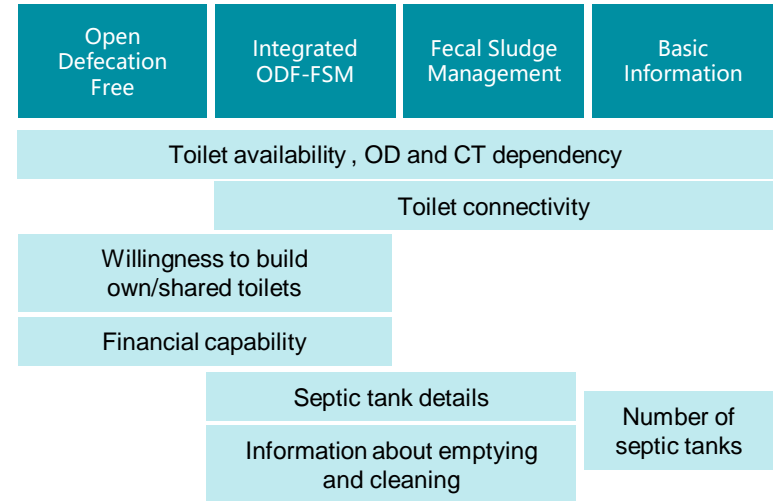
Journey of SaniTab from a data collection tool to a monitoring tool

Sani Tab is developed as a **data collection tool** incorporated with four questionnaires.

100+ surveys in Vietnam to assess sanitation-related activities from an institutional perspective

75000+ surveys in Puri and Baripada to build **city-level sanitation database**

Sani Tab forms to **monitor emptying of septic tanks at CTs and PTs** are deployed in Wai and Sinnar.

Sani Tab dashboard for monitoring desludging operations are developed for Wai and Sinnar

5000+ surveys and counting for baseline sanitation assessment in Vita

2015   **2016**   **2017**   **2018**   **2019**   **2020**

7000+ household surveys in Wai for **building city-level sanitation database**

150+ surveys in Pathri and **800+ surveys in Sinnar** to **assess the household's willingness to apply for toilet loans**

Sani Tab evolves into a monitoring tool. Sani Tab forms for monitoring scheduled desludging operations are implemented in Wai and Sinnar. **3500+ surveys** and counting...

Iteration in the monitoring Sani Tab form to **cover the CWIS aspects** of servicing vulnerable areas and gender inclusion

150+ Sani Tab surveys conducted for ascertaining sanitation worker safety with a focus on PPE Usage

SaniTab used as a monitoring tool

Use of city-level sanitation database generated via SaniTab to formulate strategies for the city to achieve Open Defecation Free (ODF) status

Using the integrated (ODF+FSM) questionnaire, 7000+ household surveys were done in Wai in 2015.

Application of Sani Tab led to the generation of a city-wide sanitation database in Wai. Some of the details captured were :-

   I.   Households resorting to open defecation

   II.   Households' access to toilets

   III. Households' dependency on community toilets

   IV. Willingness to construct toilets and access sanitation credit

   V.   Toilets connected to septic tanks and its details

   VI. Average frequency of emptying septic tank

   VII. Size and shape of septic tanks

   VIII. Accessibility of septic tanks

   IX. Problems encountered while desludging

   X.   Reasons for emptying septic tanks

Based on this database, Wai Municipal Council formulated strategies to achieve the ODF status and a plan to move towards of faecal sludge and septage management. As Sani Tab also captured the spatial details of the properties surveyed, it was possible to identify and focus on the vulnerable areas.

Wai turned ODF in 2016 and has been carrying out scheduled desludging services in partnership with a private operator since 2018.

Property level data collection with the use of SaniTab

Baseline Sanitation System Assessment

Households without toilets
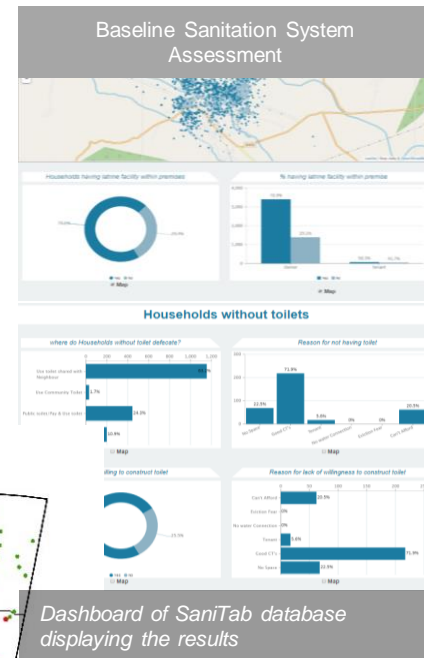
Dashboard of SaniTab database displaying the results

- ● Individual toilet
- ● No toilets
- ● CT / PT

Toilet coverage in Wai as per the Sani Tab results

Sani Tab collects geo points which can be converted to a spatial map

Evolution of SaniTab from a data collection tool to a monitoring tool

Attributing to the customizable nature of the app, SaniTab is being used not only as a data collection tool but also as a monitoring system.

In 2018, the survey forms were customized to monitor city-wide scheduled desludging of septic tanks.

This enabled quick analysis of the data. The App can be used to **monitor scheduled as well as demand-based desludging operations** provided by the private sector as well as the ULB.

The monitoring desludging Sani Tab form is currently being used in two cities in Maharashtra – **Wai and Sinnar** for evaluating the performance of the desludging services being provided by the private sector service provider and the ULB emptier truck operator.

Additionally Sani Tab has also been used to perform monitoring of PPE usage by the sanitation workers of Wai Municipal Council.

The system also includes a dashboard developed for easy monitoring of the desludging operations.
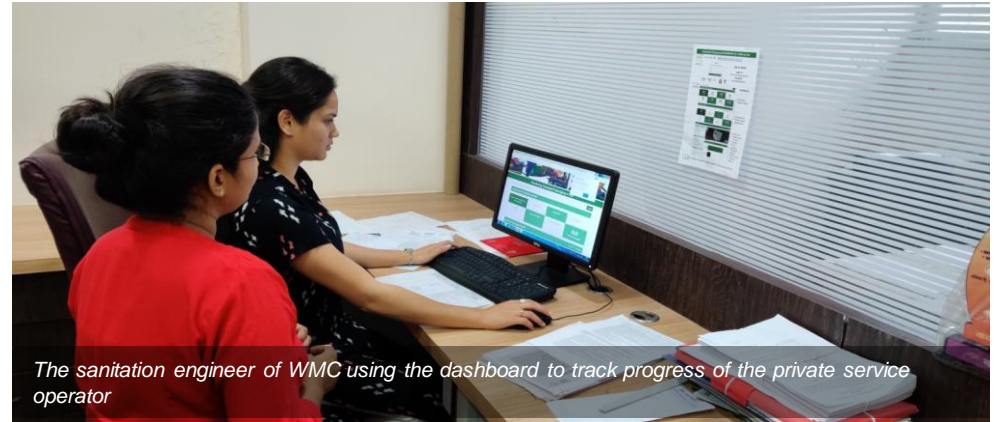
The sanitation engineer of WMC using the dashboard to track progress of the private service operator

SaniTab

Data aspects captured for monitoring the desludging services

SaniTab has been used to capture various types of data sets pertinent to planning and monitoring sanitation interventions such as desludging operations. The app has made it possible to generate a city-wide on-site sanitation system database while also monitoring the delivery of the desludging services. The data collected can be broken down as : -

Property- level data

- 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

50+ data points captured

On-site sanitation system database

- 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

Performance of desludger

- 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

On-site sanitation system database generated via SaniTab aided in responding to initial challenges faced during the beginning of desludging operations
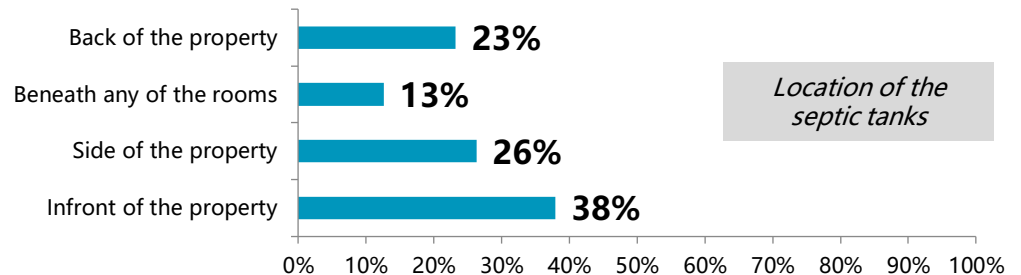
One of the unique features of Sani Tab is that it enabled generation of city-wide on-site sanitation system database. Wai, which is entirely dependent on septic tanks is one of the first cities to have a detailed database of the city's septic tanks. Currently, a **database of 2000 septic tanks** has been generated through the monitoring SaniTab form. The septic tank database has been helpful in planning the desludging operations in the city and aided the Wai Municipal Council to set an operational procedure for the private operators to follow. Some of the key findings for the city of Wai have been as follows -

- Average size (in ft) of a septic tank is **7.5x4x5**

- **98%** of the septic tanks connected to individual household toilet

- **86%** septic tanks are easily accessible

- **97%** septic tanks are rectangular in shape

- **95%** septic tanks have three chambers

- **90%** covers of the septic tanks were open during the service visit

Long pipe used to access septic tank located in a narrow lane for desludging service

During the starting phase of desludging operations, there were challenges faced due to narrow lanes. This was brought to light on analysis of the septic tank database.
- An emptier truck with a capacity of 600 lts. was procured for accessing properties with narrow lanes.
- Long pipes are being currently used to access dense properties.

Location of the septic tanks

Location	%
Back of the property	23%
Beneath any of the rooms	13%
Side of the property	26%
Infront of the property	38%

*data till September 2020

CWAS   CRDF   CEPT RESEARCH AND DEVELOPMENT FOUNDATION   CEPT UNIVERSITY   About SaniTab   Features of SaniTab   Users of SaniTab   Adaptability/Scalability   Annexure   10

Many septic tanks had a tile fixed to the opening that needed to be broken and replaced after desludging

Analysing the septic tank database paved way to interesting findings that helped the private desludger and the municipal council to come up with strategies to smoothen the desludging operations.

Only **22% of the properties had openable access covers over their septic tanks while 71% had tiles as septic tank covers**. Tiles was found to be the most popular choice for covering septic tanks. During the time of emptying these tiles had to be broken. This led to a secondary form of analysis capturing the access covers chosen by the properties at the time of resealing of septic tanks.

- In **72%** of service visits, **no problems** were encountered during the time of emptying.
- In the rest of the cases the most reported problem was of breaking floor tiles to access the septic tank.

*Tile cover of septic tank broken to carry out desludging service*

Informing residents to open septic tanks prior to the scheduled date of emptying became a part of awareness drive in Wai.

The property owners were advised to choose openable covers at the time of resealing septic tanks.

Wai Municipal Council in order to save the desludgers time provided a mason for breaking the tile covers.
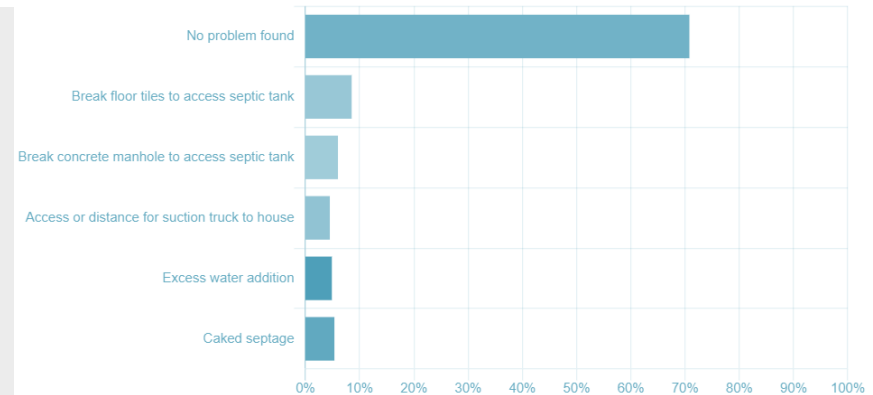

Problems faced during emptying

Dashboard based on SaniTab database enables quick analysis and monitoring of FSSM activities

In the initial phase of desludging operations a paper-based monitoring system was set up. About 10 essential data points could be captured using the paper-based system. Sani Tab made it possible to capture extensive details of the desludging service for increased efficiency and smoother operations.

With over 50 data points to analyze, a dashboard was developed to enable quick and easy analysis of the database. The data collected on Sani Tab is linked to the dashboard. Some of the key features of the dashboard are as follows –

- The dashboard shows **real-time progress** and allows for quick analysis of the data. The dashboard is used to **view the overall, monthly and daily progress of the desludging operations.**

- The dashboard also **enables spatial information** to view the distribution of the services.

- The dashboard captures various details such as:-

  i.   Coverage of types of properties

  ii. Household's readiness to receive service

  iii. Vulnerable areas covered

  iv. Problems faced during emptying operations

  v.   Last time septic tank was emptied

  vi. PPE usage by the service provider

  vii. Performance of the service provider

- The dashboard can be shared with the stakeholders involved in the FSSM activities like – urban local body and the private service provider. It is an effective means to stay informed about the levels of service being provided by the private operator.
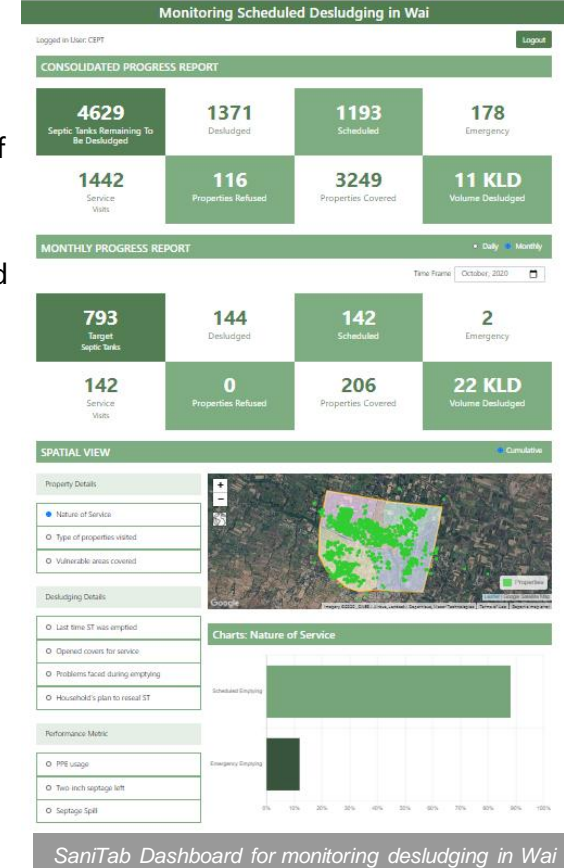
SaniTab Dashboard for monitoring desludging in Wai

SaniTab captures CWIS Principles – vulnerable urban areas, gender equity and sanitation worker safety

Citywide Inclusive Sanitation (CWIS) is an initiative by BMGF. Inclusive sanitation has been defined as a state of urban sanitation, where all members of the city have access to adequate and affordable sanitation services through appropriate centralized and decentralized systems, without any contamination to the environment along the sanitation value chain.

As Wai became a CWIS city in 2018, the Sani Tab monitoring form underwent

an iteration to include some of the following principles –
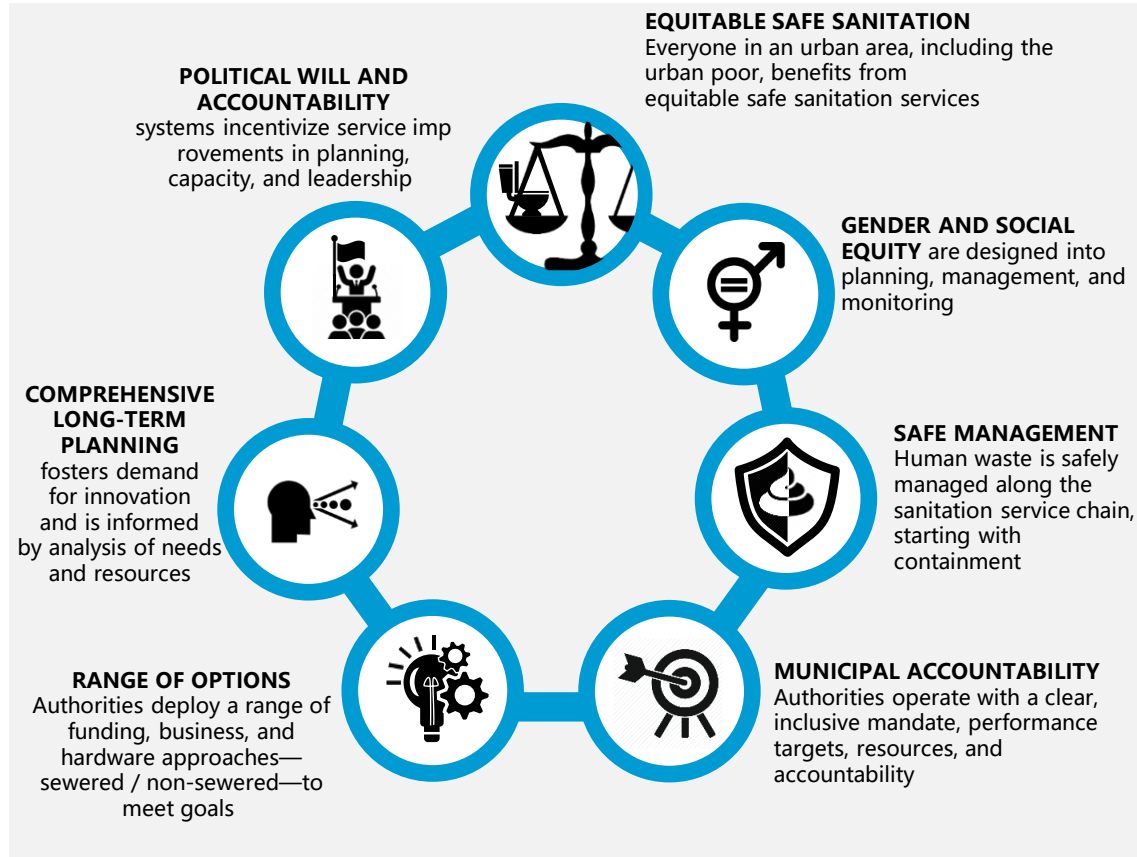
1. **Equitable safe sanitation**

Sani Tab captures the properties located in vulnerable areas that have received emptying services.

2. **Gender and social equity**

Sani Tab captures the inclusion and participation of women in the monitoring process.

3. **Sanitation worker safety**

Sani Tab captures the PPE usage by the sanitation workers and also records the type of PPEs that are in use.

POLITICAL WILL AND ACCOUNTABILITY systems incentivize service improvements in planning, capacity, and leadership

EQUITABLE SAFE SANITATION Everyone in an urban area, including the urban poor, benefits from equitable safe sanitation services

GENDER AND SOCIAL EQUITY are designed into planning, management, and monitoring

SAFE MANAGEMENT Human waste is safely managed along the sanitation service chain, starting with containment

MUNICIPAL ACCOUNTABILITY Authorities operate with a clear, inclusive mandate, performance targets, resources, and accountability

RANGE OF OPTIONS Authorities deploy a range of funding, business, and hardware approaches— sewered / non-sewered—to meet goals

COMPREHENSIVE LONG-TERM PLANNING fosters demand for innovation and is informed by analysis of needs and resources

Adapted from : City wide inclusive sanitation (CWIS) principles, Sakshi Gudwani , BMGF

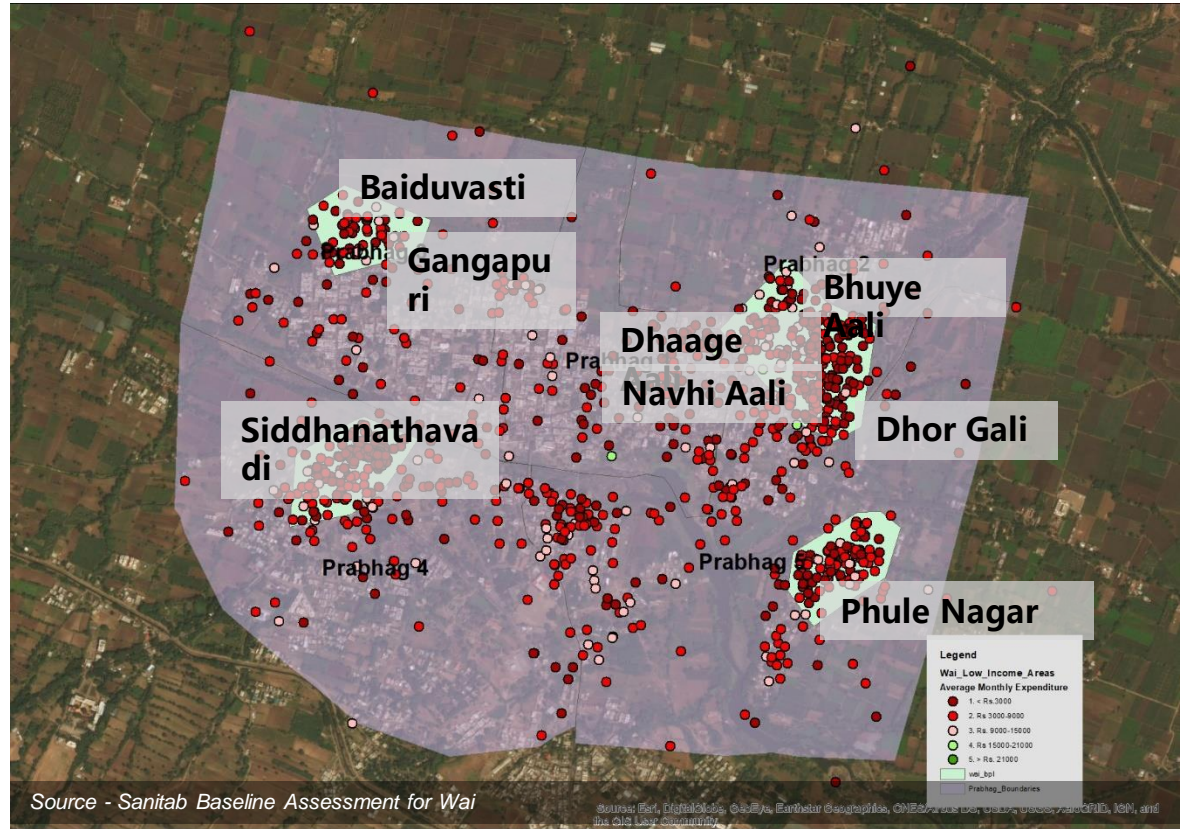# Equitable safe sanitation: Identifying vulnerable areas in Wai

As stated in CWIS principles, everyone in an urban area including the urban poor must benefit from safe sanitation services.

In the context of the desludging operations the vulnerable areas can be defined as –

i) Properties occupied by Below Poverty Line card holders.

ii) Properties where the road width is less than 3 meters, hence making it difficult for emptier trucks to access the septic tanks at these properties.

Using the baseline assessment database of Wai generated in 2015 through Sanitab, the vulnerable areas in the city were identified in consultation with Wai Municipal Council.

These areas were mapped and added to the dashboard to track that vulnerable areas received septic tank desludging services.

Source - Sanitab Baseline Assessment for Wai

Equitable safe sanitation : Ensuring coverage of vulnerable areas for desludging operations

In order to ensure that properties in vulnerable areas of the city were covered under the desludging operations the monitoring Sani Tab form was revised to include the following data points to serve as validation checks –

• Do you have a BPL card?

• Is the width of the property road less than 3 mts.

For properties with road width less that 3mts the following solutions were implemented –

i)   a long hose was used to access the septic tank of a property from the main road.

ii)   small emptier truck of 600 L capacity was deployed in dense areas of the city with narrow lanes.

650+ properties have received emptying services, i.e **one-fifth** of the properties that have received emptying services so far were situated in the vulnerable areas.

Screenshot from the Dashboard depicting the coverage of emptying services in vulnerable areas.

Gender Equity: Ensuring participation and inclusion of women in monitoring FSSM services

CWIS principles focus on designing, planning and monitoring service delivery in a way that ensures gender equity.

While analyzing the data for the reason for refusal of desludging service it was found that in the absence of a male member of the household, the women would usually refuse the service.

Since the female members of the household are mostly present at home when the emptying operations are carried out between the time period of 8 am – 4 pm, an awareness drive was carried out to intimate the women about the importance of the emptying service.

In order to ensure participation and inclusion of women in the monitoring process the monitoring Sani Tab form was revised to include questions related to the gender of the respondent of the survey and gender of the resident supervising the desludging operations at their property.

In a period of 4 months, **20% of the emptying operations were supervised by the female members of the household.**

Active users of SaniTab

The simplicity of SaniTab app allows various kinds of users to adopt it for data collection and monitoring the sanitation scenario in a city.

Some of the current users of Sani Tab have been categorized as follows –

URBAN LOCAL BODIES

Many urban local bodies in India have used SaniTab for citywide baseline sanitation assessment. The database then forms the basis evaluating a city's sanitation scenario and devising sanitation planning strategies such as achieving ODF/+/++ status.

PRIVATE SECTOR OPERATOR

The private operator carrying out a service in partnership with a city government have use Sani Tab to monitor their performance and to leverage the data to increase efficiency and resolve issues. For eg. the private desludgers in Wai and Sinnar use the app to capture data to stay informed about the emptying targets and track their team's performance.

CONSULTANCY FIRMS

Consultancy firms have used Sani Tab for assessment of the current situation and monitoring the performance of the proposed situation. For eg E&Y used the app to build a sanitation database for two cities of Odisha – Puri and Baripada

RESEARCH ORGANIZATIONS

The database generated with the help of Sani Tab is used by research organizations for analysis of the current situation and identifying gaps.

Dissemination of SaniTab at national and international platforms

Sani Tab has found its relevance in India and internationally.

Sani Tab received its first international recognition when it became a part of the Asian Institute of Technology's **FSM toolbox**. The FSM toolbox is a web platform with a suite of tools and resources designed to assist and guide to undertake assessments and planning infrastructure investments. Sani Tab forms a part of the assessment tool in the toolbox.

As part of the Govt of Maharashtra's plan to move towards ODF+/++ FSSM interventions are being implemented. Workshops have been conducted to discuss the applicability of Sani Tab is evaluating the FSM ecosystem in any city.

Experiences of using Sani Tab in Wai and Sinnar as a monitoring tool for improved FSSM delivery has also been shared at various platforms such as the **FSM 5** conference, the **IWA development congress** and **SIWI world water week**.

Sani Tab has also been presented to the joint secretary of MoHUA as a simple web-based monitoring system that can be institutionalized and made available to the stakeholders for a quick view of the analyzed data.
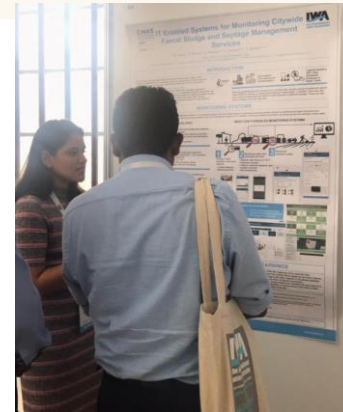
Features of SaniTab that allow scalability of its use

Sani Tab has been used widely in various cities in India and as well as internationally in South Asian countries.

Experiences and lessons from Wai will give an insight into the usefulness and **benefits of generating a city level sanitation database** and implementing a web-based FSSM monitoring system. This can also be adopted statewide with a government strategy to bring about citizen awareness about emptying procedures.

The web-based monitoring system can also be institutionalized and made available to the stakeholders for a quick view of the analyzed data.

The features listed below make Sani Tab scalable –

- The only pre-requisite of using SaniTab is an android smartphone/tablet with steady internet connection. This makes the tool easy to use.

- In case of network issues the survey data entries can be made and saved. These data entries can then be submitted once there is network connectivity.

- The SaniTab forms can also be made available in vernacular languages – opening the App to a wide range of users. Pictures and symbols can also be used as options to questionnaire to make it more user-friendly.

Adaptability of SaniTab in other cities

SaniTab is **easy to adopt** owing to its user-friendliness. The web-based monitoring system can be easily customized to suit the city's needs.

This simple to use app has been adopted in many cities of India and internationally as well – eg. Vietnam.

| Requirements	SaniTab Applicability
Scheduled emptying operations	✓ As is
Emergency/ Demand-based emptying operations	✓ As is
Vernacular language	✓ Can be made available in any language
Symbols/Pictures/Video as options instead of text	✓ Possible with minor change
Poor/slow Network connectivity	✓ Connectivity required only when submitting data, can be used as is for filling forms
Concurrent users in different locations	✓ As is
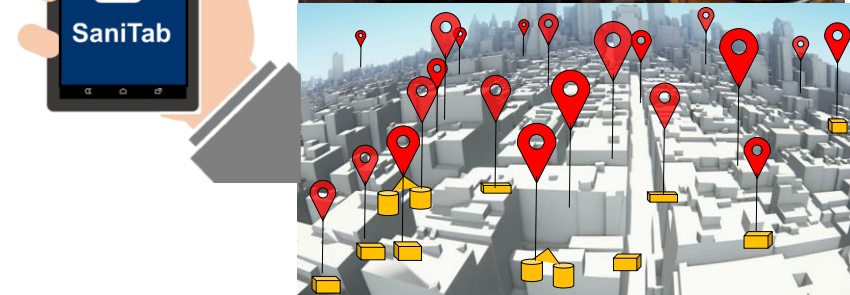
SaniTab

Transerve Technologies Pvt Ltd   **Productivity**

3+

This app is compatible with your device.
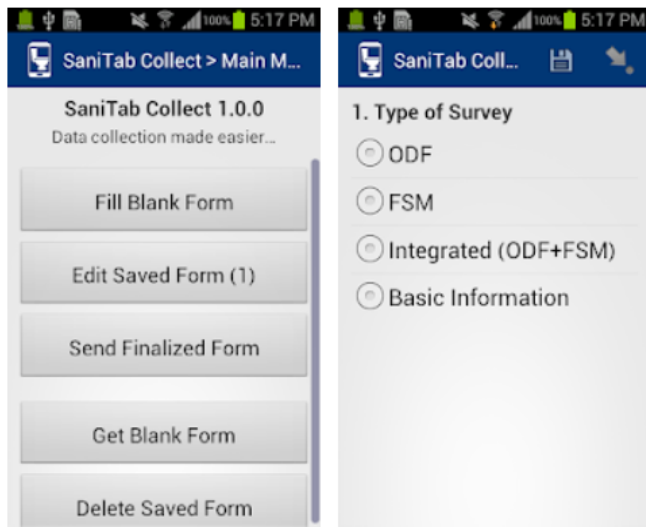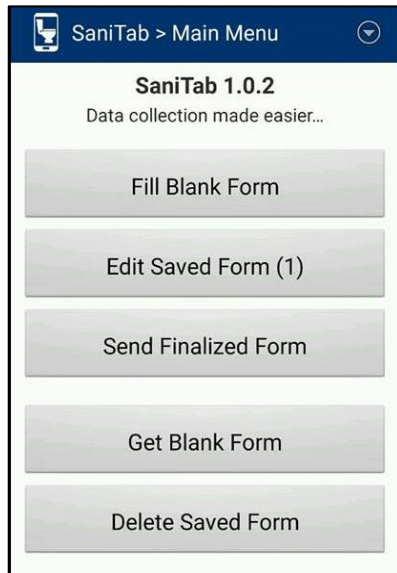
Sanitab is available on Google Play Store.

Download and Install to use

How SaniTab works?

1. Home Screen

SaniTab > Main Menu

SaniTab 1.0.2
Data collection made easier...

- Fill Blank Form
- Edit Saved Form (1)
- Send Finalized Form
- Get Blank Form
- Delete Saved Form

2. Selection of Survey

SaniTab > Fill Blank Form

Finished scanning. All forms loaded.

Monitoring Desludging in Sinnar
Version: 20190521
Added on Tue, Dec 03, 2019 at 13:05

Monitoring Desludging in Wai
Version: 20190531
Added on Fri, Nov 29, 2019 at 11:18

Monitoring Emptying Services by ULB in Sinnar
Version: 20190723
Added on Tue, Dec 03, 2019 at 13:05

Monitoring Emptying Services by ULB in Wai
Version: 20190723
Added on Tue, Dec 03, 2019 at 13:05

Resealing of Septic Tanks in Wai
Version: 20190703
Added on Tue, Dec 03, 2019 at 13:05

Sanitab_integrated_Questionnaire
Added on Tue, Dec 03, 2019 at 13:05

3. Sample list of Questions to be answered

SaniTab > Monitor...

Date of Emptying:

January 2020
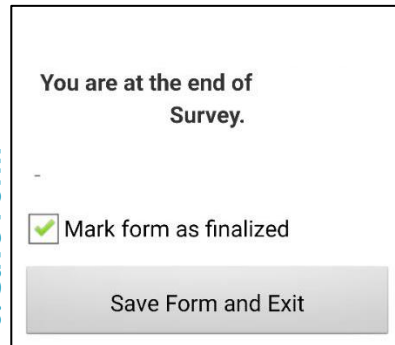S M T W T

Jan 2020

13 14 15 16

1. Form id (should be same as the one used in emptying form)

2. Zone no. (as per schedule emptying plan)

3. Ward Number

4. What is the name of the locality?

5. Property number as per Council property tax records:

6. Status of property during the visit
Open

7. Nature of service

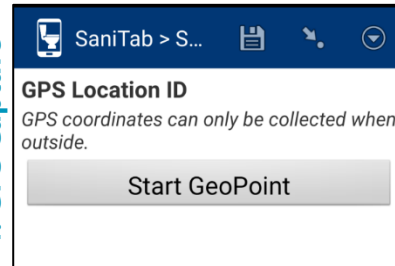8. Is owner ready to empty the septic tank/pit today?

4. GPS Capture

SaniTab > S...

GPS Location ID
GPS coordinates can only be collected when outside.

Start GeoPoint

5. Take Photographs

SaniTab > S...

Photographs

Take Picture

Choose Image

6. Save Form

You are at the end of Survey.

-

☑ Mark form as finalized

Save Form and Exit

1	Go to 'Fill Blank Form' to begin survey.	2	Select the survey form to b filled from the list.
3	Enter the relevant information/ details.	4	Capture the GPS details to record spatial information
5	Take photo as a check that property received service.	6	Save the form and submit

About us

The Center for Water and Sanitation (CWAS) 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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